

**Final**

**Alameda Watershed Management Plan**

**San Francisco Public Utilities Commission**

**April 2001**

# **Alameda Watershed Management Plan**

**prepared for**

**San Francisco Public Utilities Commission**

**prepared by**

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**in association with**

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*Appendices are available upon request from the San Francisco Water Department.*

### **Appendix A. Alameda Watershed: Management Plan Elements and Miscellaneous Material<sup>1</sup>**

#### *Volume I*

- A-1 Alameda Watershed Fire Management Element, August 1996
- A-2 Alameda Watershed Grazing Resources Management Element, July 1997
- A-3 Sunol Valley Resources Management Element October 1997

#### *Volume II*

- A-4 Alameda Watershed Natural and Cultural Resources, June 1994
- A-5 Alameda Creek Water Resources Study, January 1995 (\*)

#### *Volume III*

- A-6 Alameda Creek Water Resources Study Appendices A-1, January 1995 (\*)

### **Appendix B. Alameda Watershed: Map Digest<sup>1</sup>**

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### **Appendix C. Peninsula and Alameda Watersheds: Surveys and Technical Memoranda<sup>2</sup>**

#### *Volume I*

- C-1 Watershed Sanitary Survey for the Alameda and Peninsula Watersheds, December 2000

*Volume II*

- C-2      Technical Memorandum #1: San Francisco Water System Review for Facilities and Practices, April 1993
- C-3      Technical Memorandum #2: Water Quality Vulnerability Zone Development Security Screening, March 1994
- C-4      Technical Memorandum #3: Sediment Yields of Alameda and Peninsula Watersheds, September 1994
- C-5      Technical Memorandum #4: Visual Resources, November 1996
- C-6      Technical Memorandum #5: Best Management Practices (to be completed)
- C-7      Technical Memorandum #6: Economic Profile of Watershed Land Management by the San Francisco Water Department, November 1993
- C-8      Technical Memorandum #7: Demographic Profile of Areas Adjacent to Peninsula and Alameda Watershed Lands, November 1993
- C-9      Technical Memorandum #8: General Plans Review, June 1994
- C-10     Technical Memorandum #9: Utilities and Infrastructure Review, June 1994
- C-11     Technical Memorandum #10: Regional Recreational Facility Inventory, June 1994
- C-12     Technical Memorandum #11: SFPUC Policies, September 1993

**Appendix D.      Peninsula and Alameda Watersheds: Planning Process and Public Participation Reports and Materials<sup>2</sup>**

*Volume I*

- D-1      Public Opinion Survey Report, February 1994
- D-2      Technical Memorandum #12: Watershed Management Planning Process, September 1996
- D-3      Agency Interview Summaries, February 1994

**Public, Agency and Staff Workshop Summaries**

*Volume II*

- D-4      Workshop Summary Report #1, May 1993
- D-5      Agency Workshop Report #1, July 1993
- D-6      Agency Workshop Report #2, January 1994

*Volume III*

- D-7      SFWD Staff Workshop Report #1, February 1994
- D-8      Public Workshop Report #2, April 1994
- D-9      Public Workshops and Joint Agency Workshop #3, June 1994
- D-10     Summary of SFPUC Hearings on the San Francisco Watershed Management Plans, January 1995
- D-11     Summary of Public Involvement and Agency Coordination Activities, August 1992-June 1996
- D-12     Presentation Boards

**Newsletters and Brochures**

D-13    Watershed Watch Newsletters

- Volume 1, February 1993
- Volume 2, May 1993
- Volume 3, Fall 1993
- Volume 4, Spring 1994
- Volume 5, Winter 1995
- Volume 6, Fall 1996
- Volume 7, Summer 1997
- Volume 8, Fall 1997
- Volume 9, Summer 2001

D-14    Brochures

Coordinated Water Management: An Orientation to the Water System of the City and County of San Francisco

- 1    Material in this Appendix has been prepared exclusively for the Alameda Watershed.
- 2    Material in this Appendix covers both the Peninsula and Alameda Watersheds, and therefore it is a common Appendix to both the Peninsula Watershed Management Plan and the Alameda Watershed Management Plan.
- 3    The Sunol Valley Resources Management Element Draft Public Involvement Summary Report (August 1995) is included in the Sunol Valley Resources Management Element, Appendix A-3.



**Chapter 1:  
Introduction**

## Chapter 1. Introduction

### 1.1 Purpose and Vision

Over 130 years ago the predecessor of the San Francisco Public Utilities Commission (SFPUC)<sup>1</sup>, Spring Valley Water Works, had a vision of protected watershed lands that would provide a pure and reliable water supply for the developing economy of San Francisco. In the last half of the 19th century, Spring Valley Water Works began purchasing the watershed lands that are now managed by the SFPUC. They first acquired the 23,000-acre San Francisco Peninsula Watershed and then the 36,000-acre Alameda Creek Watershed in the East Bay. Today, these two watersheds remain largely protected and continue to serve their primary purpose — to collect and store a reliable supply of high quality water for the homes and businesses in the San Francisco Bay Area.

The SFPUC’s mission for managing the Peninsula and Alameda Watersheds is “to provide the best environment for the production, collection, and storage of the highest quality water for the City and County of San Francisco (CCSF) and suburban customers.” The SFPUC seeks to accomplish this by “developing, implementing, and monitoring a resource management program which addresses all watershed activities.” The watershed management program will “apply best management practices for the protection of water and natural re-

sources and their conservation, enhancement, restoration, and maintenance while balancing financial costs and benefits” (SFPUC 1993). In response to this mission statement and because existing SFPUC policies do not address the management of watershed lands in a comprehensive or integrated manner, the Peninsula and Alameda Watershed Management Plans (“Plans”) have been prepared.

The purpose of the Plans is to provide a policy framework for the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on SFPUC watershed lands. To aid the SFPUC in their decision-making, the Plans provide a comprehensive set of goals, policies, and management actions which integrate all watershed resources and reflect the unique qualities of the watersheds.

In addition to serving as a long-term regulatory framework for decision-making by the SFPUC, the Plans are also intended to be used as watershed management implementation guides by the SFPUC’s Land and Resource Management Section (LRMS) staff. The Plans provide the LRMS manager and staff with management actions designed to implement the established goals and policies for water quality, water supply,



*San Antonio Reservoir*

<sup>1</sup> Also commonly referred to as the San Francisco Water Department (SFWD).

## Watershed Management Goals

### Primary Goal

 Maintain and improve source water quality to protect public health and safety.

### Secondary Goals

 Maximize water supply;

 Preserve and enhance the ecological and cultural resources of the watershed;

 Protect the watersheds, adjacent urban areas, and the public from fire and other hazards;

 Continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands, including educational, recreational, and scientific uses;

 Provide a fiscal framework that balances financial resources, revenue-generating activities, and overall benefits, and an administrative framework that allows implementation of the Watershed Management Plans; and

 Enhance public awareness of water quality, water supply, conservation, and watershed protection issues.

ecological and cultural resource protection, fire and safety management, watershed activities, public awareness, and revenue enhancement. The Plans also enable LRMS staff to address and plan for future management of issues such as fire management, erosion control, range management, public access, security, development encroachment, and ecological resource management.

The Plans stress the long-term balanced management of the watersheds and look beyond the immediate desires of the present generation to the needs of future generations. As the population of the Bay Area expands and water regulations become increasingly strict, future generations will be challenged to provide a clean and reliable water supply. Paramount to maintaining high quality water and protecting water supplies in the long term is control over watershed activities and preservation of watershed resources. The Plans recognize that in order to move toward a more balanced environment, all decisions regarding use of the watershed must be evaluated against the principles of natural resource conservation.

Furthermore, the Plans recognize that effective watershed management requires all of the watersheds' natural and man-made resources — vegetation, wildlife, soils, streams, cultural artifacts — to be managed as an integrated whole with each part interdependent upon the other. Integrated management ensures that the long-term func-

tion of the watersheds remains as maintaining high quality water.

In these Plans, the SFPUC has taken a restrictive approach to watershed management that considers water quality protection as the first and foremost goal. The primary goal is to:

- Maintain and improve source water quality to protect public health and safety.

In addition to the primary goal, the following secondary goals are also supported by the Plans' policies and management actions:

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

The Alameda and Peninsula Watershed Management Plans are two separate documents. However, Chapter 1 ad-

resses both watersheds. Chapters 2 through 6 of this document deal specifically with the Alameda Watershed.

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## 1.2 Management Plan Organization

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The Alameda Watershed Management Plan (“Watershed Management Plan” or “Plan”) consists of eight chapters. This introductory chapter provides an overview of the Plan, its purpose, and organization. Chapter 1 also summarizes the history and organization of the SFPUC; describes the overall water system and the two watersheds; and describes the Alameda Watershed Plan as it was approved and subsequently amended by the SFPUC.

Chapter 2: Existing Conditions and Resource Sensitivity provides an overview of the natural and man-made resources of the Alameda Watershed, as well as a discussion of current watershed activities, infrastructure, adjacent land uses, and revenue generation.

Chapter 3: Watershed Management Issues summarizes the key public issues and management concerns that were identified during the planning process as critical to address in the Alameda Watershed Management Plan.

Chapter 4: Watershed Management Goals and Policies identifies the primary and secondary watershed management goals established at the outset of the planning process. A set of watershed

policies which address these goals are also established. These goals and policies, as well as the management actions in Chapter 5, provide the framework for implementation of the Alameda Watershed Plan described in Section 1.6

Chapter 5: Watershed Management Actions and Guidelines defines the future of the Alameda Watershed’s land and water resources by establishing specific management actions and guidelines through which the goals and policies can be achieved. Together, Chapters 4 and 5 provide a framework for decision-making for future management of the Alameda Watershed.

Chapter 6: Phasing and Implementation prioritizes and phases the management actions; assigns implementation responsibilities; and sets forth the Watershed Management Plan review and update process.

Chapter 7: CEQA Findings and Mitigation Monitoring presents the environmental documents required by the California Environmental Quality Act (CEQA) for the Watershed Management Plan’s Environmental Impact Report (EIR). Both the CEQA Findings and the Mitigation Monitoring and Reporting Program were adopted by the

*“The Plans and look beyond the immediate desires of the present generation to the needs of future generations”*

*“Paramount to maintaining high quality water and protecting water supplies in the long term is control over watershed activities and preservation of watershed resources”*

SFPUC on September 26, 2000 (Resolution No. 00-0229). The purpose of the CEQA Findings is to support the decision of the SFPUC to approve the Alameda Watershed Management Plan with written findings of fact for each significant environmental impact identified in the EIR. When making findings on significant effects identified in an EIR, the SFPUC must also adopt a program for reporting or monitoring the adopted mitigation measures. The purpose of the Mitigation Monitoring and Reporting Program is to ensure compliance with the mitigation measures identified in the EIR during the implementation of the Plan.

Together, chapters 6 and 7 set forth the implementation plan for the Watershed Management Plan.

Chapter 8: SFPUC Resolution 00-0229 provides the text of the resolution approving the Watershed Management Plan and adopting the required California Environmental Quality Act (CEQA) Findings and Mitigation Monitoring and Reporting Program.

### **1.2.1 Appendices**

In addition to the preparation of the Watershed Management Plan, several Plan Elements, reports, and technical memoranda were also developed to support the ongoing efforts of the planning process; these documents are Technical Appendices to the Plan and are available upon request from the SFPUC.

Material prepared exclusively for the Alameda Watershed Management Plan and included as Technical Appendices includes the Alameda Watershed Natural and Cultural Resources study and geographic information system (GIS) maps, as well as three plan elements: the Fire Management Element, Grazing Resources Management Element, and Sunol Valley Resources Management Element. These Plan Elements address certain management aspects of the Alameda Watershed in greater detail and are described briefly below. Materials prepared for both Plans include technical memoranda addressing topics such as the SFPUC water system and facilities; water quality vulnerability zone development; watershed sediment yields; visual resources; economic and demographic profiles; review of applicable general plans; review of utilities and infrastructure; regional recreation facility inventory; and SFPUC policies. Other materials include the Watershed Sanitary Survey, and several planning process and public participation reports and newsletters.

### **1.2.2 Plan Elements**

#### ***Fire Management Element***

The Fire Management Element addresses the management of hazardous fuels (e.g., brush, grass, etc.) to reduce the risk of fire. The Element presents an integrated approach to fire management which considers impacts to water qual-

ity, water supply, and ecological resources. The Element also determines areas requiring fire management action; identifies recommended management techniques for these areas; and develops a day-to-day operations and maintenance plan for fire-related activities. Day-to-day operational recommendations include recommendations for criteria that trigger special precautions; actions to take under high fire danger; agreements to be made with local fire departments and agencies; and a pre-attack plan prepared in conjunction with California Department of Forestry and Fire Protection (CDF). Policies and management actions from this Element are incorporated into Chapters 4 and 5.

***Grazing Resources Management Element***

The Grazing Resources Management Element provides for the comprehensive management of grazing on the Alameda

Watershed. The actions within the Element are intended to protect water quality, water supply, and natural resources within the watershed; ensure a reliable and stable range resource; and provide a dependable flow of revenue to the SFPUC. Policies and management actions from this Element are incorporated into Chapters 4 and 5.

***Sunol Valley Resources Management Element***

The purpose of the Sunol Valley Resources Management Element is to address the integrated management of the following: water resources, gravel mineral resources, SFPUC facilities, cultural resources, agricultural resources, economic resources, recreation/park facilities, and fisheries in the Alameda Creek corridor within the SFPUC Alameda Watershed lands. Policies and management actions from this Element are incorporated into Chapters 4 and 5.



*Calaveras Dam - Early Construction*

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**1.3 History and Organization of the San Francisco Public Utilities Commission**

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**1.3.1 History**

The SFPUC had two predecessors that were responsible for the construction of much of the extensive system of reservoirs, flumes, and pipelines that currently delivers water to 2.3 million Bay Area customers. Spring Valley Water Works (SVWW) began construction on San Francisco's water system in 1860 and continued until 1903, when owner-

ship of the water system was transferred to Spring Valley Water Company (SVWC). In 1930, the SFPUC was formed when SVWC was purchased by the City of San Francisco.

The development of a water supply for San Francisco began on the Peninsula Watershed in 1864, when the dam which impounds the waters of Pilarcitos Creek

was completed. A system of flumes and pipes brought the water 32 miles to augment the City of San Francisco’s supply from local wells and springs. San Andreas Dam and Reservoir were completed six years later in 1870. The Upper Crystal Springs Reservoir was formed after the construction of the Upper Crystal Springs Dam in 1877. The Lower Crystal Springs Reservoir was formed in 1890, following the development of Lower Crystal Springs Dam on San Mateo Creek below the confluence of its main branches.

The first purchases of land and water rights in the Alameda Creek Watershed

occurred in 1875 with the acquisition of Calaveras Valley. SVWC began work in 1913 on Calaveras Dam, which created the Calaveras Reservoir. The Alameda Creek diversion dam and tunnel were completed in 1931 to divert Alameda Creek flows into Calaveras Reservoir. San Antonio Reservoir was completed in 1965.

The development of a water supply for San Francisco needed to extend beyond local watersheds of the San Francisco Bay Area to meet the demands of this growing metropolis. Between 1902 and 1913, the City of San Francisco attempted to obtain federal approvals to

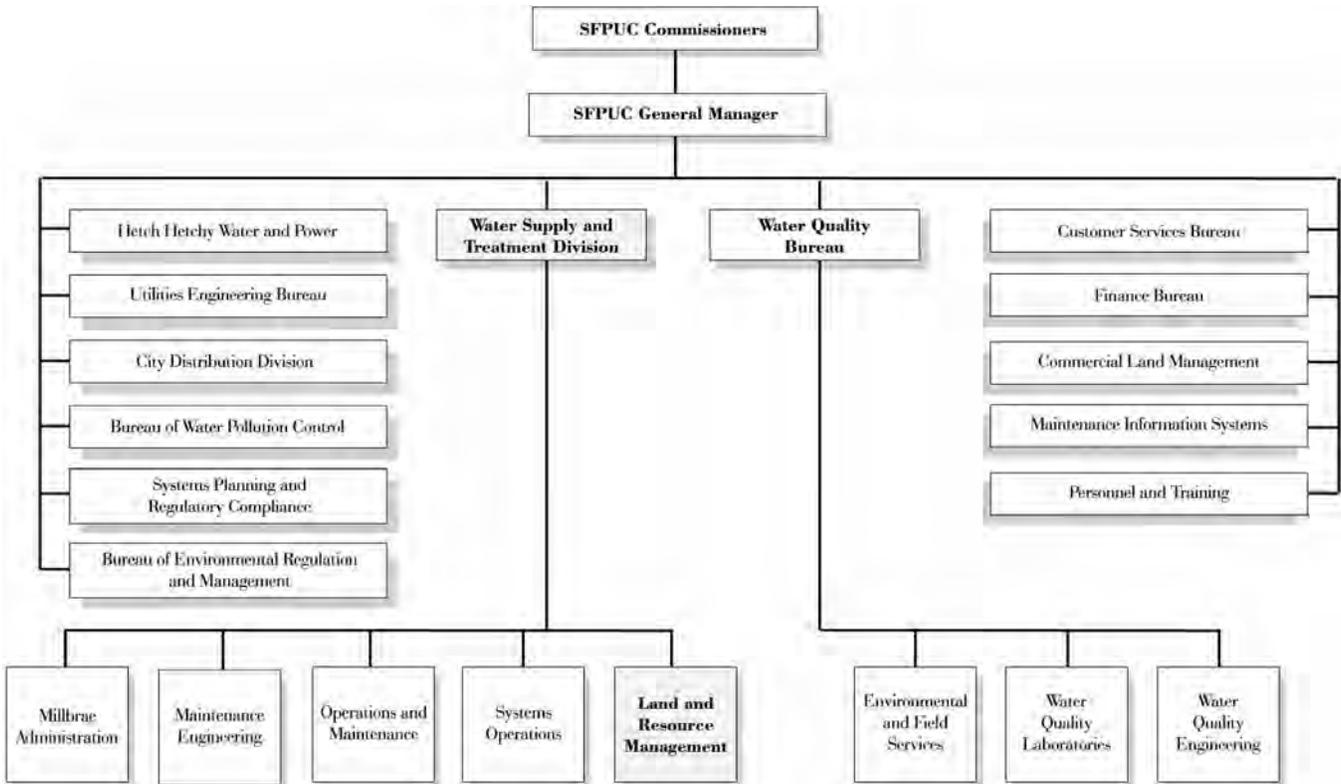


Figure 1-1 SFPUC Organization

develop a water system in the Sierra Nevada Mountains. These efforts culminated in the passage of the Raker Act in 1913. This Act enabled the City of San Francisco to develop water and power facilities on federal park and forest lands. Work on the Hetch Hetchy Water and Power system began in 1914, and the first Hetch Hetchy water flowed into Crystal Springs Reservoir on October 24, 1934.

### **1.3.2 Organization**

The SFPUC consists of five commissioners who are responsible for the major decisions relating to the 13 divisions and bureaus they oversee (Figure 1-1). The LRMS of the Water Supply and Treatment Division is responsible for watershed management on lands within the Bay Area.

Other divisions and bureaus that may be involved with watershed planning include the Bureau of Commercial Land Management, which is responsible for commercial leases and permits on SFPUC lands within the watersheds and rights-of-way (ROW) and the Water Quality Bureau. The Water Quality Bureau is responsible for water quality throughout the entire water system, including the Hetch Hetchy Water and Power system.

The Water Supply and Treatment Division is responsible for the operation and maintenance of storage, treatment, transmission, and distribution facilities

from Alameda East Portal downstream to the San Francisco County line. Operations and maintenance beyond the county line are the responsibility of the City Distribution Division. The Water Supply and Treatment Division is divided into the following sections: Systems Operations, Operations and Maintenance, Maintenance Engineering, Millbrae Administration, and the LRMS. The discussion below highlights the LRMS.

#### ***Land and Resource Management Section***

The primary function of the LRMS is the management of the Peninsula and Alameda Watersheds. The members of LRMS are primarily natural resource specialists providing direction for watershed protection, planning, research, operations, and training. A land and resources manager, three urban foresters, a watershed forester, as well as two watershed keeper supervisors and 11 watershed keepers protect and manage the water, vegetation, wildlife, and soils of the watersheds. Their objectives are to protect water quality, reduce the risk of fire, protect reservoir storage capacity, create ecological reserves, maintain wildlife preserves, monitor wildlife, and conduct flood and erosion control. One member of the LRMS is a Registered Professional Forester licensed by the State of California and fulfill the State's requirement for management of wildland resources and watersheds.

The LRMS is charged with developing watershed policy and project plans as well as specific technical studies such as hydrological and natural resource studies. The LRMS also oversees special projects related to land use activities within the watersheds. This group coordinates specific tasks with the Water Quality Bureau such as developing a water quality monitoring program and addressing hazardous materials issues. Watershed protection, operations, maintenance, restoration, improvement, and enhancement activities are planned, approved, and/or monitored by the LRMS. Day-to-day execution of these activities is performed by the Operations and Maintenance Section of the Water Supply and Treatment Division. In addition, the Bureau of Commercial Land Management staff administer land uses on watershed lands performed by lessees and other third party interests. Other SFPUC bureaus with which the LRMS coordinates include Systems Planning and Regulatory Compliance (SPARC), the Bureau of Environmental Regulation and Management (BERM), and the Utilities Engineering Bureau (UEB). SPARC conducts long range planning related to water resources. BERM is the SFPUC's central environmental management center responsible

for overseeing preparation of environmental impact reports (EIRs), keeping track of legislation, and other environmental management responsibilities. UEB is responsible for engineering, design, and construction management of all SFPUC capital improvement projects.

The LRMS also coordinates with contractors, other utilities, public agencies, and private citizen groups to ensure that the watersheds are managed to protect water quality and watershed resources, and to create a better information base for watershed management.

The LRMS has seven Peninsula Watershed keepers and six Alameda Watershed keepers who are responsible for monitoring their assigned portions of the watersheds and providing immediate first-response to emergencies. The watershed keepers' primary function is to protect the watershed and, thereby the water supply. Their duties include monitoring reservoir and stream levels, water quality monitoring, fire suppression, removing trespassers, assisting the public, monitoring the watersheds for road and other erosion damage, and checking system facilities immediately following an earthquake.

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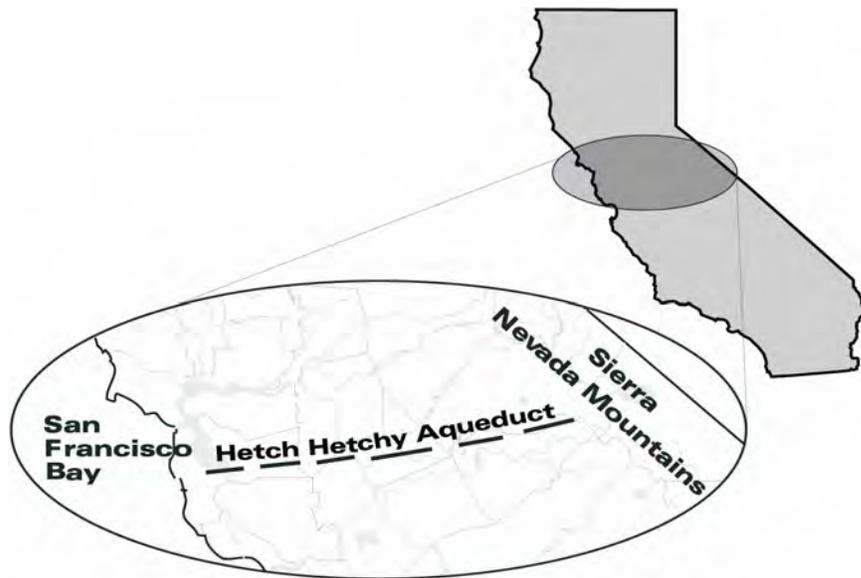
## **1.4 SFPUC Water System**

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### **1.4.1 Regional Location**

The SFPUC's water system is located in central California and encompasses wa-

tersheds in the San Francisco Bay Area and the Sierra Nevada Mountains (Figure 1-2). The SFPUC's service area includes 2.3 million customers located in



**Figure 1-2 Regional Location**

San Francisco, as well as in portions of San Mateo, Santa Clara, and Alameda Counties. An overview of the San Francisco water system as well as the two watersheds is provided below.

**1.4.2 Water System Overview**

The complete SFPUC water system obtains water from three sources: (1) Tuolumne River via the Hetch Hetchy Water and Power system in the Sierra Nevada Mountains; (2) local runoff in the Calaveras Reservoir and San Antonio Reservoir watersheds in the greater Alameda Watershed; and (3) local runoff in the Crystal Springs, San Andreas, and Pilarcitos Reservoir watersheds within the greater Peninsula Watershed. In addition, San Francisco obtains some water from groundwater basins in San Francisco, Pleasanton, and the Sunol

Valley. Approximately 85 percent of the potable supply to SFPUC customers is provided by the Hetch Hetchy Watershed. Runoff from the Peninsula and Alameda Watersheds contributes approximately 15 percent of the water supply. A diagram of the overall water system is presented in Figure 1-3.

There are ten reservoirs in the overall water system, with primary reservoirs in the Sierra Nevada Mountains, Alameda Watershed, and Peninsula Watershed. The three reservoirs in the Sierra Nevada feed the Hetch Hetchy Water and Power system. The Hetch Hetchy system delivers up to 300 million gallons daily to the San Francisco Bay Area. This water makes its 150-mile trip from the Sierra Nevada across the San Joaquin Valley to the Bay Area by gravity flow. For most of this distance, the

water is enclosed in a series of tunnels and pipelines. In the Sunol Valley, the water enters the greater Bay Area portion of the system, shown in the left portion of Figure 1-3.

The greater Bay Area portion of the system includes the five primary reservoirs on the Peninsula and Alameda Watersheds and the 59,000 acres of watershed lands in Alameda, Santa Clara, and San Mateo Counties. These local water sources, which contribute approximately 15 percent to the water supply, are blended with Hetch Hetchy water.

A portion of water delivered from the Hetch Hetchy Water and Power system

can be stored in the San Antonio Reservoir within the Alameda Watershed. This water may be combined with local runoff collected in Calaveras Reservoir and San Antonio Reservoir and treated at the Sunol Water Treatment Plant (WTP). It is then distributed to wholesale customers on its way across the San Francisco Bay. Another portion of Hetch Hetchy water may be stored in Peninsula reservoirs where it can be blended with Peninsula Watershed runoff and treated at the Tracy WTP.

Sixty-five percent of this total volume is transmitted to approximately 29 Bay Area resellers. These resellers serve

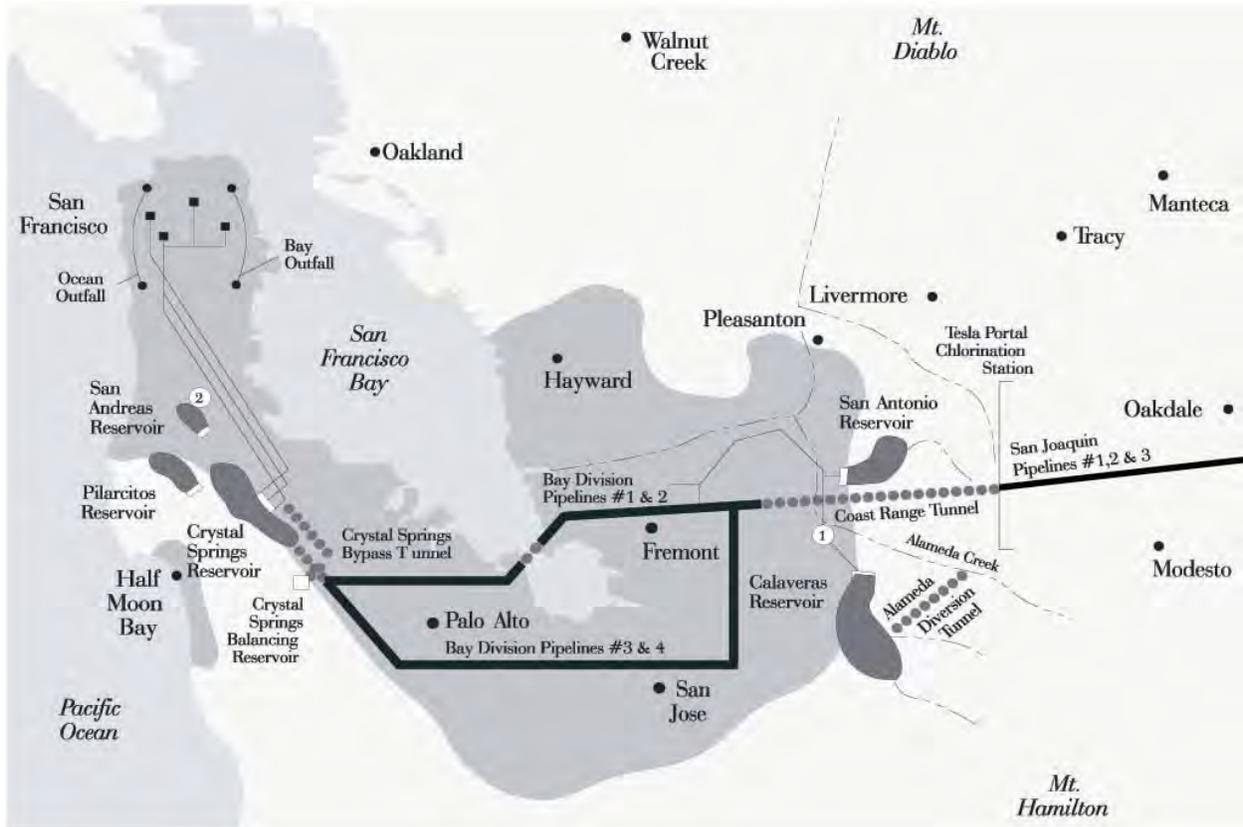


Figure 1-3 Overall SFPUC Water System

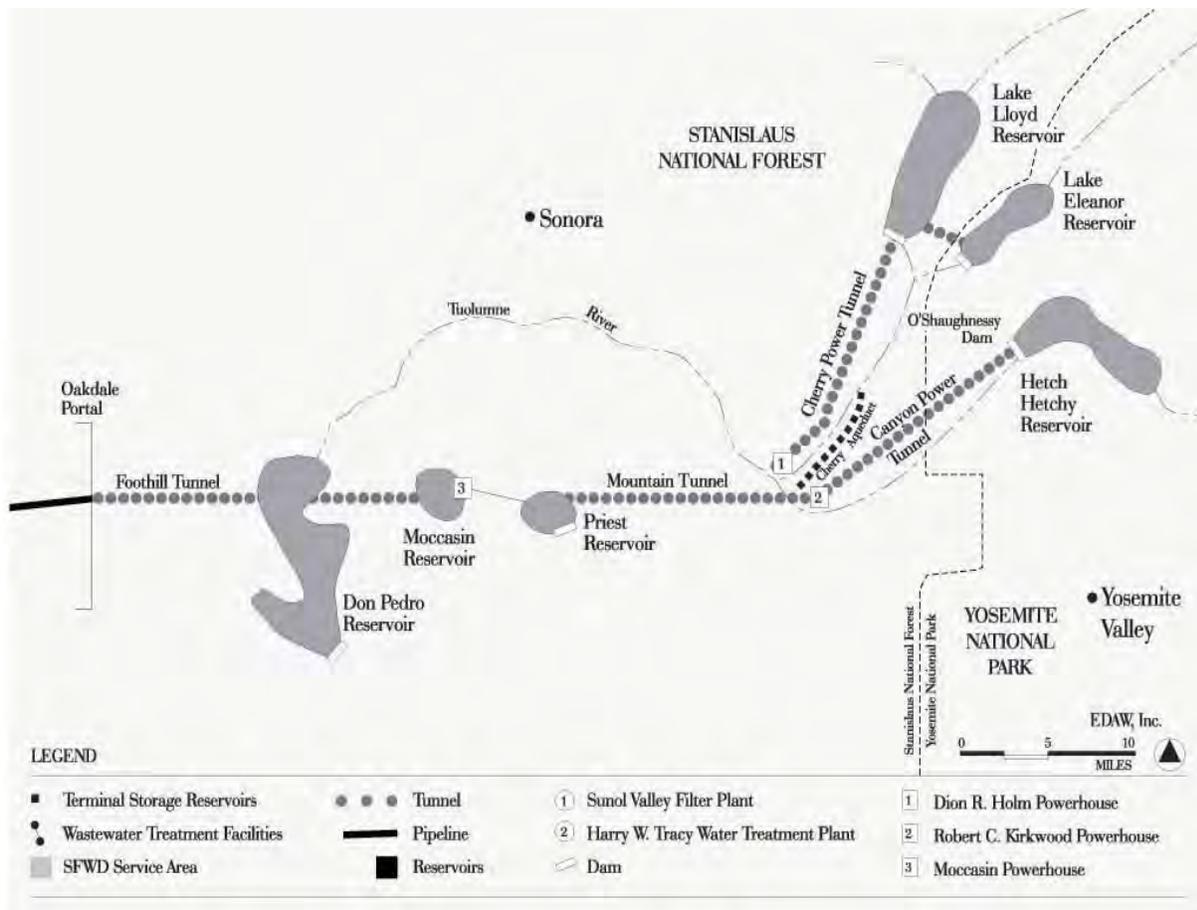
1,630,000 non-San Francisco residents in East Bay and South Bay communities and Peninsula cities. The remaining 35 percent or 90 million gallons per day is transmitted to the City of San Francisco and distributed to 770,000 San Francisco residents.

**1.4.3 Peninsula Watershed**

The Peninsula Watershed is a unique site within the greater Bay Area region. Due to its use for water collection and storage, it has been protected from the urbanization that has consumed much of the surrounding lands. The Peninsula Watershed hosts a variety of habitats

and supports the highest concentration of rare, threatened, and endangered (RTE) species in the entire nine-county Bay Area region. The watershed encompasses 23,000 acres of the San Francisco Peninsula. Virtually all of the hydrologic watershed is owned by the SFPUC (Figure 1-4).

The watershed is located in central San Mateo County and includes the San Andreas and Crystal Springs Reservoirs, adjacent to Highway 280, and the Pilarcitos Reservoir to the northwest. Land uses adjacent to the watershed are predominantly residential to the north and east and include the communities



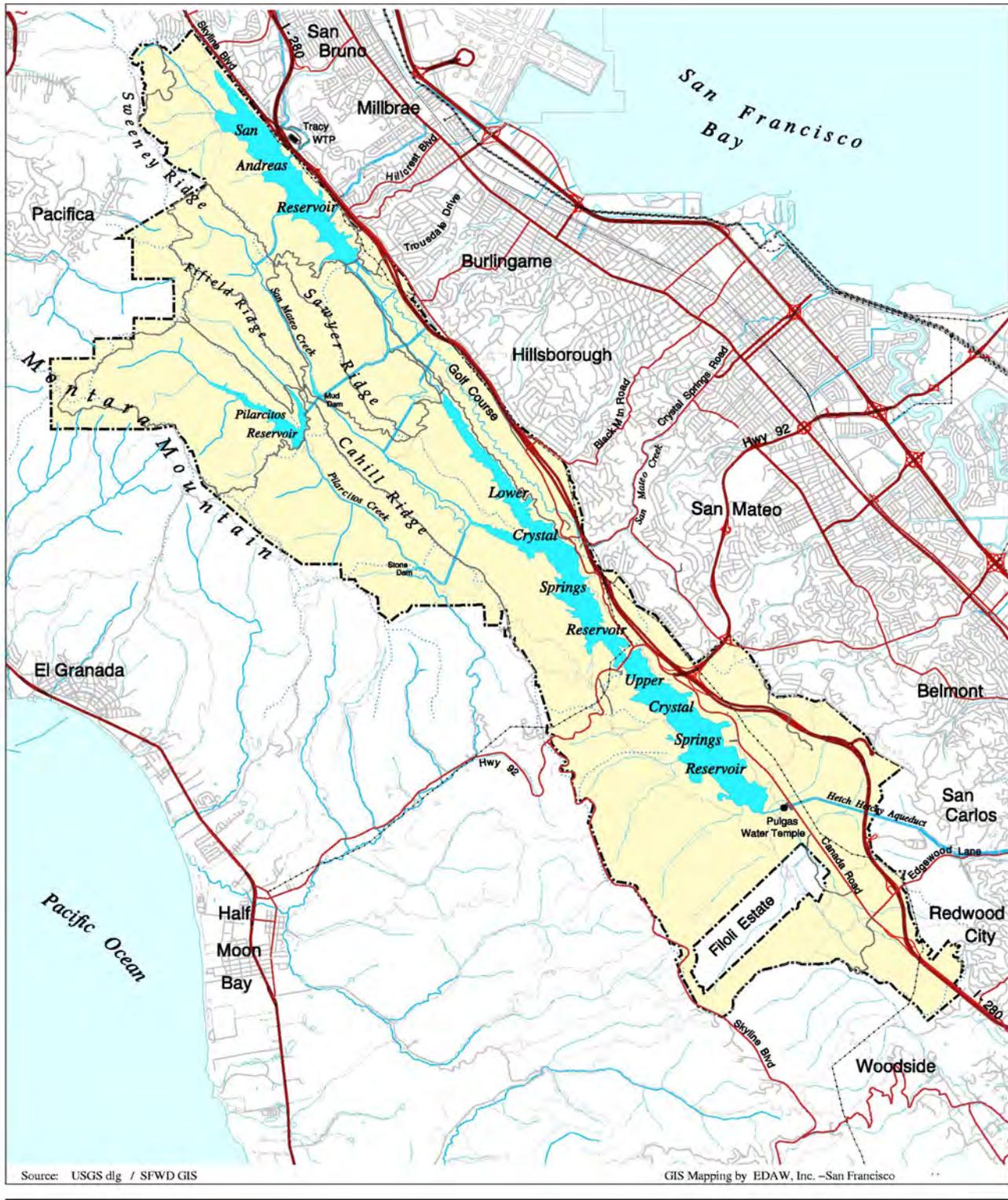
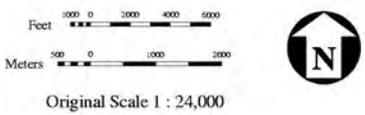


Figure 1-4 Peninsula Watershed Lands



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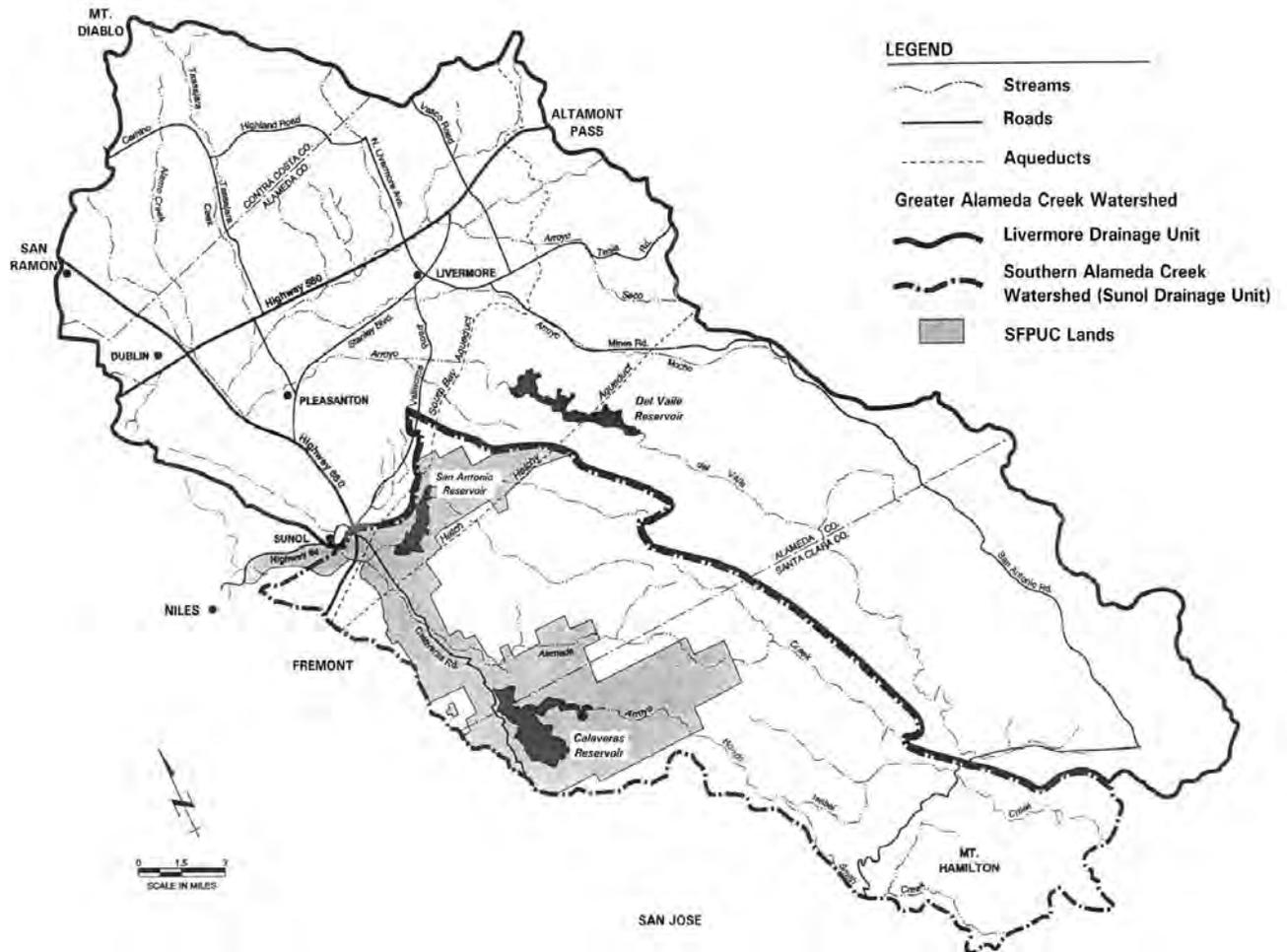
of San Bruno, Millbrae, Burlingame, Hillsborough, San Mateo, Belmont, San Carlos, Redwood City, and Woodside, as well as unincorporated private open space to the west.

The Peninsula Watershed Management Plan, available from SFPUC, provides greater detail on the Peninsula Watershed resources. The Plan also provides

detailed actions for the management of the Peninsula Watershed.

**1.4.4 Alameda Watershed**

The Southern Alameda Creek Watershed encompasses 175 square miles of rolling grassland and native oak woodlands in the East Bay (Figure 1-5), of which 36,000 acres or approximately one-third



**Figure 1-5 Southern Alameda Creek Watershed**

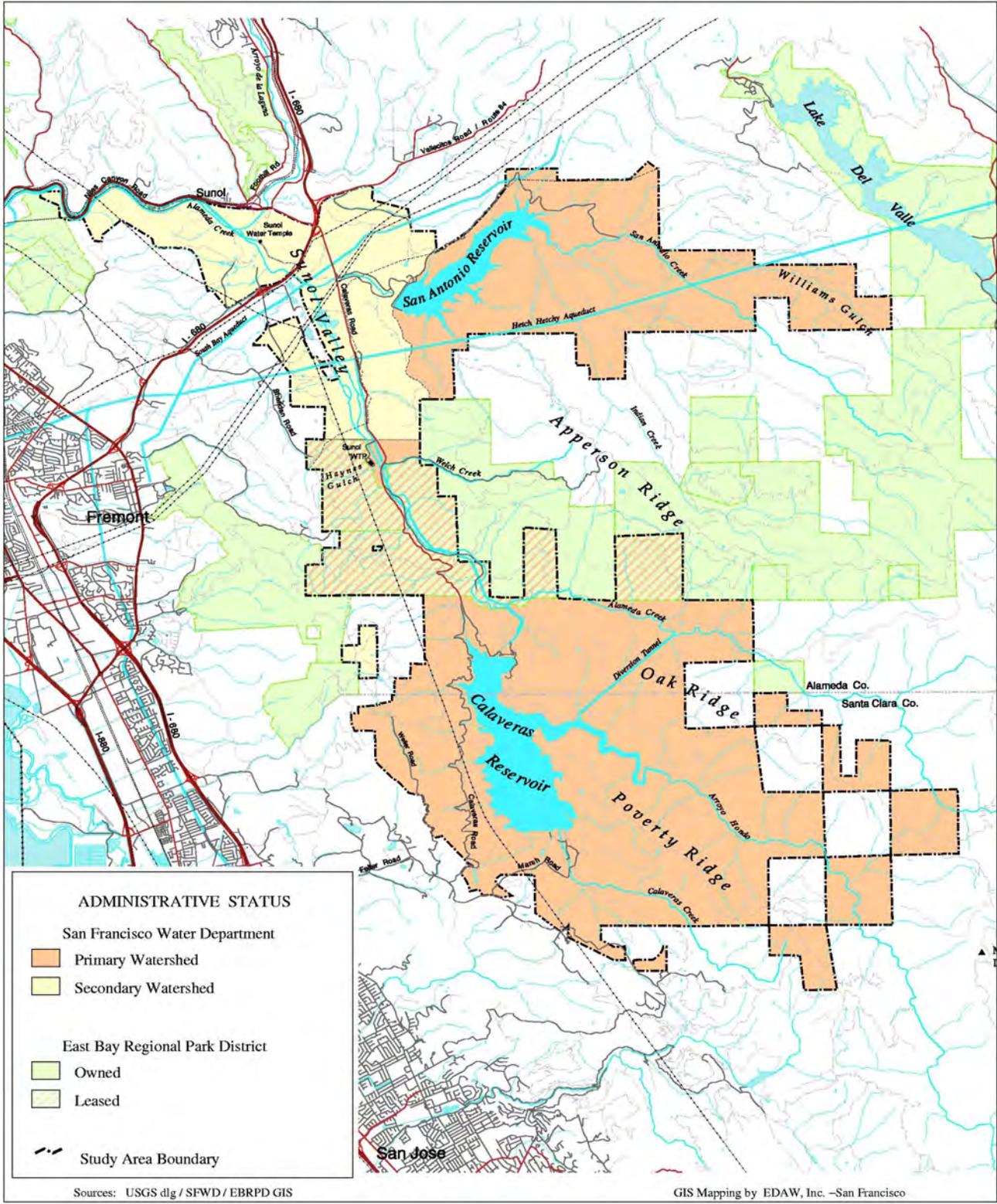


Figure 1-6 Alameda Watershed Lands

are owned by the SFPUC. SFPUC's Alameda Watershed land holdings are split between Alameda (23,000 acres) and Santa Clara (13,000 acres) Counties and contain two reservoirs — the San Antonio Reservoir to the north and the Calaveras Reservoir to the south. Highway I-680 and Route 84 meet in the northern portion of the watershed, and Calaveras Road extends in a north-south direction down the center of the watershed. Milpitas and Fremont lie to the west, and Pleasanton and Livermore are located to the northeast.

The SFPUC Alameda Watershed lands include 30,000 acres of primary watershed lands which tributary to San An-

tonio and Calaveras Reservoirs as well as lands which drain into Alameda Creek above the proposed Fish Release and Recapture Facility. SFPUC Alameda Watershed land includes 6,000 acres of secondary watershed (Figure 1-6). The latter are lands where runoff enters Alameda Creek below the Fish Release and Recapture Facility and does not enter SFPUC reservoirs or get recaptured at the Fish Release and Recapture Facility. The primary watershed lands are the most sensitive lands in terms of water quality protection.

This Plan addresses the existing conditions and future management of the Alameda Watershed.

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## 1.5 Planning Process

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The watershed management planning process commenced in August 1992 and has spanned eight years. The process addressed planning for both the Peninsula and Alameda Watersheds simultaneously, allowing for similar goals and policies to be established for all of the SFPUC's local watershed lands. The process will culminate with the completion of the Peninsula and Alameda Watershed Management Plans, as well as the EIRs that will evaluate the environmental impacts of the Plans in compliance with the California Environmental Quality Act (CEQA). Figure 1-7 illustrates the planning process, which consists of the seven stages described below, as well as an extensive, ongoing public and agency participation program.

### 1. Establish Goals

One primary and six secondary goals for watershed management were established at the outset of the project by the Watershed Planning Committee (WPC), a group of SFPUC division and department representatives who assisted the planning team in Plan development and review. These goals were set forth in Section 1.1. These goals were used by the planning team throughout the planning process to provide direction for alternative and Plan development. The goals serve as a foundation for the policies and management actions and will also serve as a basis for ongoing evaluation of Plan implementation.

### 2. Assemble GIS Database and

### 3. Prepare Resource Vulnerability Maps

Mapping of watershed resource information was conducted on a GIS. Each resource type (e.g., vegetation, wildlife, etc.) was entered into the SFPUC GIS and became a separate map (or layer). Selected layers were then “sandwiched” together to provide information-rich composite maps. A set of resource vulnerability/sensitivity maps was created for each watershed. Together, these maps are referred to as the Alameda Watershed Tool Kit, and they define areas of the watershed where the resources are most sensitive to disturbance. The tool kit composite maps are illustrated in Chapter 2.

### 4. Formulate Alternatives

The analysis of water quality, natural resource, cultural resource, and wildfire severity data gathered for the watershed was incorporated with the public comments and public survey results to form three watershed management alternatives (A, B, and C). These alternatives applied to the management of both watersheds. The three alternatives provided varying degrees of water quality improvement as well as a focus on either ecological resource protection or public access. Alternative A provided the highest improvement in water quality and emphasized ecological resource protection and enhancement. Alternative B provided moderate improvement in water quality and balanced ecological resource protection and public access/activity. Alternative C provided slight improvement in water quality and emphasized increased public access/activity.

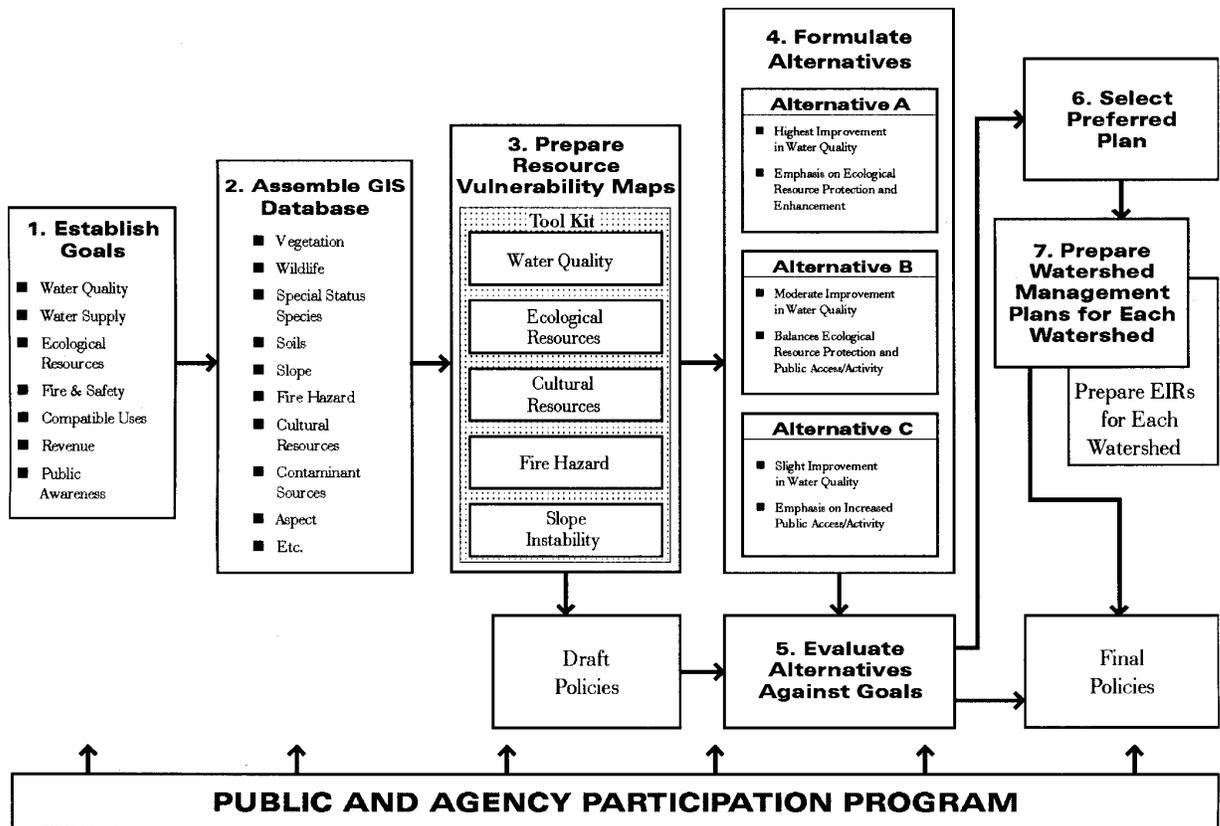


Figure 1-7 Planning Process

tive B provided a moderate improvement in water quality and provided a balance between ecological resource protection and public access and activity. Alternative C provided a slight improvement in water quality and emphasized increased public access and activity. Additional information on the alternatives is included in Appendices D-2, D-9, D-10, and D-13.

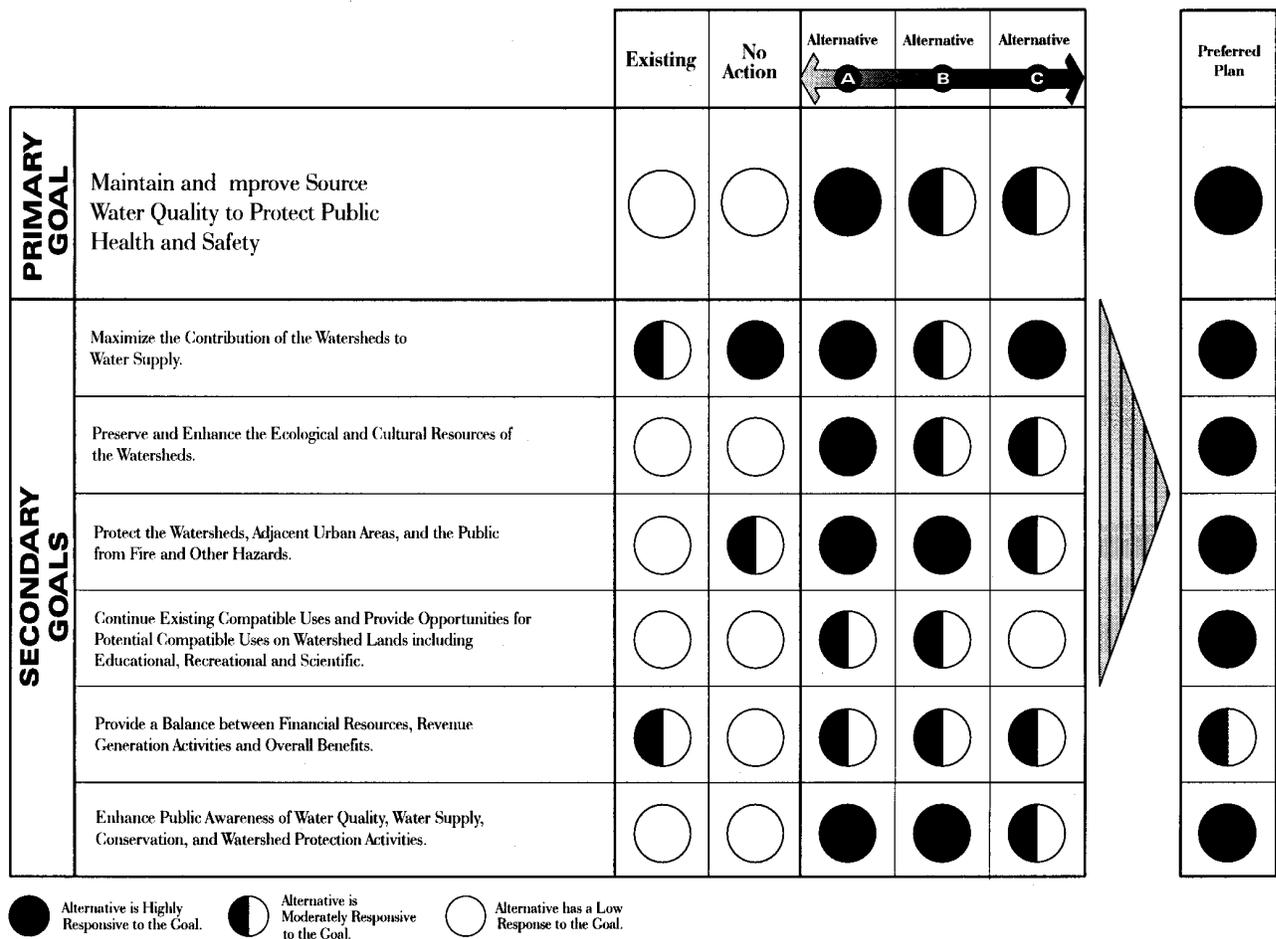
**5. Evaluate Alternatives and  
6. Select Preferred Alternative**

Alternatives A, B, and C were evaluated against the primary and secondary goals and the requirements set by the various

agencies with jurisdiction over the watershed. The alternatives were also presented at public, agency, and staff workshops.

The preferred alternative was derived from an evaluation of the three alternatives using the following techniques:

- The primary watershed management goal and the six secondary goals were arrayed against the alternatives to determine which alternative best met the goals. (Figure 1-8).



**Figure 1-8 Comparative Evaluation of Alternatives**

- The three alternatives were presented to meeting participants at the public, agency, and staff workshops in June 1994. Each participant was asked to identify where they felt the SFPUC should manage watershed lands on a spectrum that ranged from closing the watersheds completely to opening the watersheds for unlimited access and activities. Alternatives A and C represent the reasonable outside limits of the alternatives, and Alternative B represents the midpoint between the two. In general, public opinion favored Alternative B. However, agency and staff opinion was split between Alternatives A and B.

As a result of the alternatives evaluation process, the Watershed Management preferred alternative was selected and approved through an SFPUC resolution in January 1995. The preferred alternative applied to both the Peninsula and Alameda Watersheds. The preferred alternative combined Alternative B with some components of Alternative A. The preferred alternative, as it was approved in January 1995, strives to provide for better than moderate improvement in

water quality and balances ecological resource protection with water quality needs, public access and watershed activities. Subsequent amendments to the Alameda Watershed preferred alternative include the Sunol Valley Resources Management Element (May 1996) and the Alameda Watershed Grazing Resources Management Element (July 1997).

#### **7. Prepare Management Plans and EIRs.**

The general direction provided by the SFPUC on the preferred alternative has been developed into two specific watershed management plans — The Peninsula Watershed Management Plan and the Alameda Watershed Management Plan. Each Plan provides polices for decision making and actions for day-to-day management which are specific to the character and resources of each watershed.

The environmental impacts of each Plan will be evaluated in an EIR, along with an evaluation of the other alternatives. The results of the EIR have required revisions to the Plans and mitigation measures have been incorporated into the final Plans.

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## **1.6 SFPUC Direction on the Preferred Alternative**

As noted above, the SFPUC approved the “Watershed Management Preferred Alternative” in January 1995. The Watershed Management Preferred Alternative provided *general* direction for preparation of the Peninsula and

Alameda Watershed Management Plans. The direction provided by the SFPUC was identical for both watersheds and did not account for the individual differences between each watershed nor did it account for differences between

existing activities on the watersheds (with the exception of grazing and aggregate mining).

The Watershed Management Preferred Alternative allowed the SFPUC to provide the planning team with direction, prior to plan preparation, on the activities of greatest concern - namely public access and recreation. During preparation of the Watershed Management Plans the direction provided by the SFPUC was expanded upon with the result being the formation of two distinct Plans with policies and management actions appropriate to the unique setting and activities of each watershed. The Watershed Management Plan is composed of the goals, policies, and management actions set forth in Chapters 4 and 5. These provide for appropriate management of the watershed and its resources, as well as guidance on the types of recreation activities that are appropriate to the watershed.

The SFPUC direction regarding the Watershed Management Preferred Alternative is outlined below. A brief discussion regarding the current status of each activity as well as the rationale for its inclusion in the plan is also provided. Text in italics indicates the Preferred Alternative language adopted by the SFPUC. When it was adopted, this language applied to both watersheds.

### ***Watershed Management Activities***

- *Following establishment of baseline*

*monitoring, conduct ongoing water quality and ecological resource monitoring.*

- *Reduce watershed fuel loads.*
- *Increase staff to support ecological resource protection and public access. Staff responsibilities will focus on implementing watershed practices to protect water quality and ecological resources, and on fire management.*
- *Establish Best Management Practices or SFPUC operations and maintenance activities.*

The purpose of the watershed management plans is to provide for improved management of the watersheds to meet the primary goal of water quality protection as well as the secondary goals of watershed management. These watershed management activities are deemed necessary to support the level of activity identified in the Preferred Alternative.

*Existing public trails are open to individuals and groups without a permit except where a permit is currently required.*

SFPUC leases a portion of its lands to the East Bay Regional Park District (EBRPD) as part of the Sunol Regional Wilderness and the Ohlone Regional Wilderness. The Sunol Regional Wilderness includes trails for hikers, hikers, and equestrians, and several multi-use trails for hikers, equestrians, and mountain bikes. Trails in the Ohlone Regional Wilderness are designated for hikers only with the exception of the Ohlone Wilder-

ness Trail which accommodates both hikers and equestrians. Access to the Ohlone Wilderness Trail is by permit only. The Plan provides for the continuation of these requirements on the trails managed by EBRPD on the Alameda Watershed.

*Addition of new trails in zones of lesser vulnerability and risk is allowed.*

New trails in low vulnerability zones adjacent to developed areas and SFPUC watershed boundaries and connections with urban areas and trail facilities of other agencies will be given priority. These trails will be open to individuals and groups without a permit. EBRPD has proposed new trails in areas of low vulnerability on the Alameda Watershed.

As part of the Plan, new trails will be restricted to areas of low vulnerability and risk to protect water quality and ecological resources. Current trail demand is highest for short hikes close to urban areas. The proximity to existing trails and developed areas allows for a connection with adjacent communities and their trail systems, while protecting watershed resources from disturbance caused by the construction of new trails in less accessible areas.

*Individual access to existing internal roads and fire roads is not permitted under the Plan.*

Access to existing internal roads and fire roads is by permitted groups accompanied by volunteer leaders. Access to the

interior parts of the watershed to unescorted individuals is prohibited as it poses an extreme risk of fire as well as a higher risk of degradation of water quality and ecological resources.

*Group access to internal roads and fire roads is currently restricted on the Alameda Watershed. Under the Plan, group access to internal portions of the watershed will be allowed through establishment of a reservation program allowing individuals to make reservations and be part of a group tour of the watershed.*

This activity will be expanded to the Alameda Watershed under the Plan as it allows access to the internal roads and trails on the watersheds in a supervised setting. In addition, this program will be designed so that individuals may make reservations and be part of a group tour of the watershed without being a member of a chartered group.

*Equestrians are not allowed except on existing and designated new public trails.*

Equestrians are currently allowed on selected EBRPD trails in the Sunol and Ohlone Regional Wilderness areas. Under the Plan, equestrians will be allowed access to designated existing public trails, future additions to the existing public trail system, and new trails that will be open to the general public.

*Mountain biking is allowed on designated existing and new public trails only.*

Mountain biking is currently allowed on selected EBRPD trails in the Sunol Regional Wilderness. It is not allowed on trails in the Ohlone Regional Wilderness. Experiences of the Marin Municipal Water District and other agencies throughout the State and country have found that mountain biking is an extremely difficult sport to control. A significant percentage of mountain bikers do not stay on designated trails resulting in problems such as unauthorized construction of new “outlaw” trails, and demands to open new single track trails. These activities contribute significantly to soil erosion and damage to natural resources. Also, conflicts between mountain bikers and other trail users (e.g., hikers, equestrians) often result. The Plan provides for mountain bike use on designated existing and new public trails only. Mountain biking will continue to be prohibited in the EBRPD Ohlone Wilderness and on internal roads within the Alameda Watershed.

*Fishing is not allowed, except in designated streams and reclaimed quarries.*

Fishing is not currently allowed on any of the watersheds’ reservoirs because it would take place in one of the watershed’s most sensitive areas — the water’s edge. The water’s edge is included in the High Water Quality Vulnerability Zone (WQVZ) and is extremely susceptible to erosion. Any substance that spills at the water’s edge will find its way into the reservoir immediately. To protect water quality, fish-

ing will not be permitted in any of the existing reservoirs. However, fishing may be allowed on a section of Alameda Creek between the Sunol Regional Wilderness and Sunol Valley, as designated by the SFPUC and as regulated by the California Department of Fish and Game (CDFG). Fishing may also be allowed at some future time on one of the reclaimed quarries in the Sunol Valley as designated by the SFPUC.

*Scientific study is allowed by permit only:*

Scientific study access is currently allowed by permit only. The Plan continues this practice to increase the understanding of the watersheds’ resources and biodiversity. Frequently, the findings of scientific study on the watersheds contribute to the SFPUC’s understanding and knowledge base of the watersheds, thereby adding value to the management of these lands. Using a computer-based GIS, the SFPUC will be able to update their database with the results of any scientific studies on the watersheds. In addition, SFPUC will be able to add other features and planned modifications to the GIS and study the impacts of these modifications on the watershed environment.

*Consideration will be given to developing one **Environmental Education Center** on the watershed. This center would provide docent-led activities and other educational activities. Designated picnic areas for **day use** only will also be considered.*

Currently, there are no visitor or educational centers on the watershed. The EBRPD operates a visitor center at its Sunol Wilderness Parking Area. Because the watershed provides tremendous educational opportunity, a day use environmental education center on the watershed is included in the Plan. This center could provide education for school groups and the general public regarding water quality and water quality protection, water supply and conservation, the watershed ecosystem, principles of a sustainable environment, and cultural resources. It could also provide a starting point for docent-led group hikes, an area for picnics, and an area for docent training.

*Existing golf courses will be retained and expansion of existing golf courses will be considered in low vulnerability/sensitivity zones. No new golf courses will be permitted.*

There is currently one golf course on the Alameda Watershed—the 36-hole Sunol Golf Course. Because the natural condition of these lands is already disturbed, the existing golf course will remain under the Plan. Nevertheless, it will be subject to strict monitoring requirements and other guidelines for water quality protection. Expansion of this existing course will only be allowed in low vulnerability/sensitivity areas. New golf courses are prohibited on the Alameda Watershed because they require conversion of several hundreds acres of watershed land from a natural habitat to a man-made landscape and also re-

quire significant water consumption and the use of fertilizers and pesticides.

*Grazing on the Alameda Watershed will be managed to protect water quality, reduce fire hazard, and enhance native vegetation. Animal Unit Months (AUMs) will be greatly reduced from existing conditions, and measures will be developed to protect the water and ecological resources from cattle impacts. The SFPUC approved a Grazing Resources Management Element in July 1997 which is included in Appendix A-2 and sets forth requirements for implementing the requirements of the Plan.*

Grazing is currently allowed on the Alameda Watershed. Historically, management of this activity has been less than adequate and cattle have damaged the streams and riparian corridors. Fencing has not been maintained as required and cattle have entered the reservoirs. However, when small numbers of cattle are well managed, they can serve as a fire management tool to help increase native vegetation and reduce invasive exotic species. To protect water quality while continuing to utilize the beneficial aspects of grazing, the Grazing Resources Management Element, which was adopted by the SFPUC in July 1997 and is incorporated into the Alameda Watershed Management Plan, provides for a strict cattle management program, accompanied by watershed monitoring to ensure water quality, reduce fire hazard, help increase native vegetation, and reduce exotics.

*Aggregate mining will continue on the Alameda Watershed with quarry pits restored for water storage and recreation.*

Aggregate mining currently occurs in the Sunol Valley on the secondary watershed. The following requirements for aggregate mining were approved by the SFPUC in May 1996. North of Interstate 680 (I-680), mining for gravel extraction will be based on the footprint established by Alameda County in Surface Mining Permit (SMP) 32. Prior to completion of mining, this pit will be infilled to establish a 1/4-mile buffer as increased mitigation for cultural resource impacts on the Sunol Water Temple. Landscape and recreation plans consistent with the requirements of SMP-32 will also be prepared. These plans will provide for the restoration of the Sunol Water Temple, its historic entry, and public use of the temple area. South of I-680, the SFPUC approved two options to be addressed in the Alameda Watershed Management Plan. Option 1 would expand the permitted areas and depths of the pits while Option 2 would retain the existing permitted areas to a depth of 200 feet. Both options call for the restoration and management of the quarries for emergency water storage and potential recreational use.

*Nurseries will require greater setbacks from waterbodies.*

Existing nurseries in the Alameda Watershed are located in the secondary watershed in the Sunol Valley along

Alameda Creek. Currently, these nurseries are required to provide reports to the SFPUC regarding their use of pesticides and fertilizers. Setting the nurseries farther back from Alameda Creek provides a larger buffer between the chemicals used by the nurseries and Alameda Creek. The SFPUC provides water to Alameda County Water District (ACWD) via Alameda Creek, and the impact of these activities on downstream beneficial uses is of concern to both SFPUC and ACWD.

Only those activities designated by SFPUC as allowable will be permitted on watershed lands.

*Incompatible activities include the following:*

- Unauthorized boating on existing reservoirs;
- Campgrounds;
- Camping;
- Unauthorized motorized vehicles;
- Water activities in existing reservoirs;
- Shooting ranges;
- Hang gliding;
- Off-trail use;
- Off-road use;
- Dogs except guide dogs;
- Unauthorized removal of watershed resources (plant materials, firewood, cultural resources);
- Release of domestic animals;
- Smoking;
- Littering;
- Alcohol;
- Unauthorized fires;

- Hunting shall be allowed for animal control purposes only, by agreement with SFPUC.

A number of existing regulations are in place prohibiting various activities on the watershed. These include regulations set forth by the State codes and regulatory agencies such as the Public Resources Code, CDFG, and the California Department of Forestry. In addition, the SFPUC currently prohibits a number of these activities on the watersheds. As part of the Plan, the activities listed above will be formally prohibited as they are considered in conflict with one or more of the watershed management goals. Existing regulations imposed by other agencies will also remain in force and are incorporated into the Watershed Management Plan.

*Policies will be developed for **additional compatible activities and uses.***

The watershed activities identified above are those of the most concern to SFPUC and the public. The Watershed Management Plans also include policies and management actions for activities not discussed above.

*The **cost of providing recreational facilities** shall not be borne by water rate payers.*

SFPUC's primary responsibility is to provide high quality drinking water to its customers and rate payers; to maintain the facilities necessary for the transport, storage, and treatment of this water; and to conduct responsible natural resource management. During the January 1995 SFPUC hearing, the issue of payment for recreational activities and docents was discussed by the SFPUC Commissioners. In response to this issue, an additional motion was passed by the SFPUC stating that non-water related costs would not be borne by the rate payers. 



**Chapter 2:  
Existing Conditions and  
Resource Sensitivity**

## Chapter 2. Existing Conditions and Resource Sensitivity

### 2.1 Introduction

This chapter presents an overview of the existing conditions on the Alameda Watershed as they relate to geology and soils, hydrology, water quality, vegetation, wildlife, fisheries, cultural resources, aesthetics, fire hazard, land status and adjacent uses, transportation and access, utilities, operations and maintenance, recreation, other watershed activities, and revenue generation. The sensitivity of each resource is also discussed in this chapter. Resource vulnerability and sensitivity zones were identified for water quality, ecological resources, cultural resources, soils, and fire hazard using a GIS. The set of GIS maps illustrating these zones comprise the “Alameda Watershed Tool Kit” and

serve as a basis for identifying those areas of the watershed that are most sensitive or vulnerable to disturbance and therefore least suitable for accommodating watershed activities.

The high vulnerability/sensitivity zones from each of the individual sensitivity maps were combined to create the Composite High Sensitivity Zones shown in Figure 2-1. The composite map illustrates that there are few places within the watershed that are completely free of resource vulnerability/sensitivity and many areas where two or more of the high resource sensitivity areas overlap, indicating vulnerability or sensitivity for multiple resources.



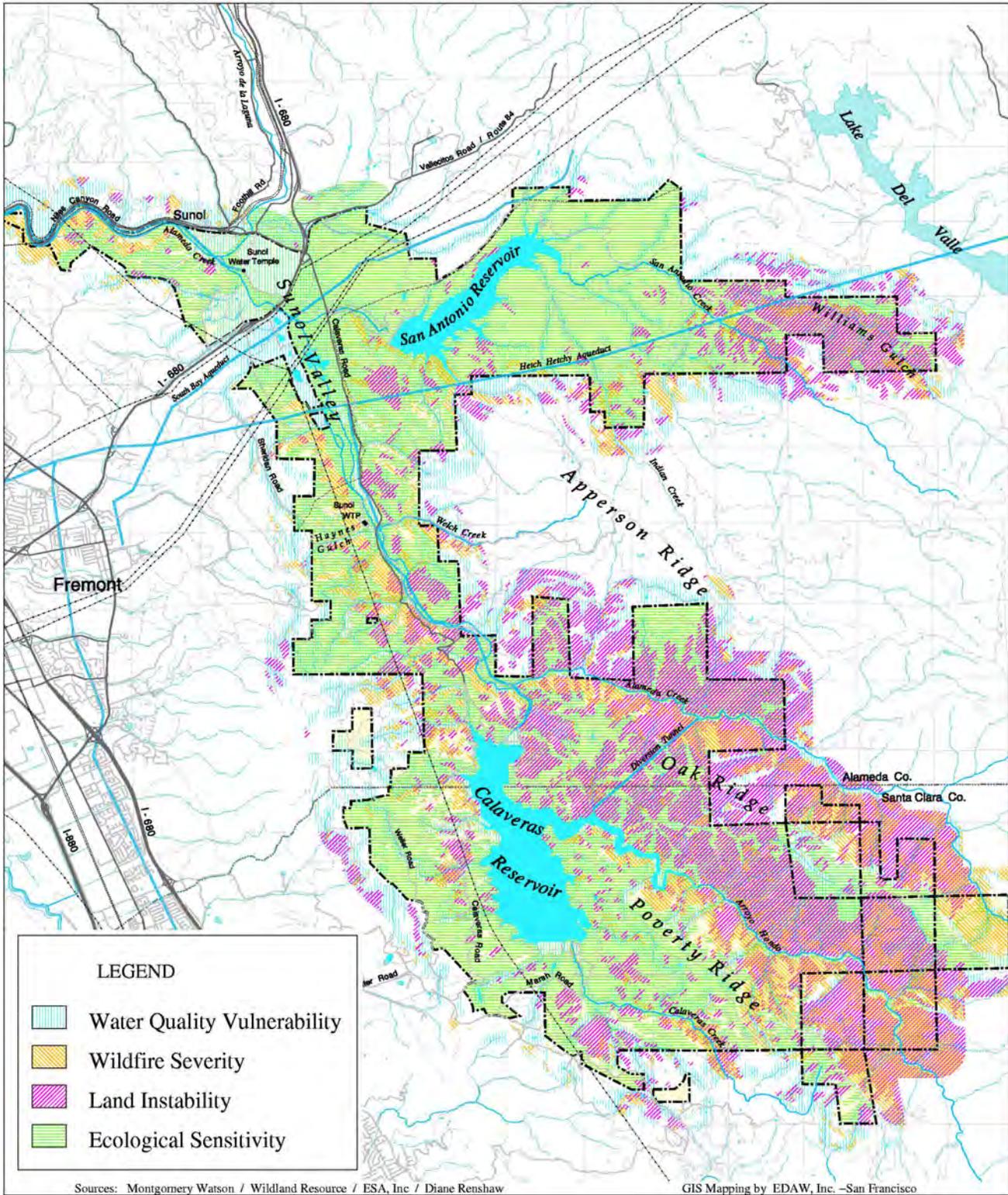
*Watershed Grasslands*

### 2.2 Geology and Soils

The topography of the overall hydrologic watershed—termed the Southern Alameda Creek Watershed—consists of a major northwest-trending rift valley (along Calaveras Creek and Sunol Valley and the north extension to Amador Valley), a major east-west valley (La Costa Valley and San Antonio Creek Valley), and rugged terrain surrounding the major valleys. The geology of the Alameda Watershed is dominated by the presence of the Calaveras fault zone,

which created the rift valley and separates the watershed into halves with markedly different geologic formations and structures.

Numerous soil types throughout the watershed have erosion hazard ratings of severe or very severe. Although few of the upland soils, except the Positas soils, have inherent soil characteristics that make them highly erodible, the soils are highly sensitive to disturbance and are



Original Scale 1 : 24,000

**Figure 2-1 Composite High Sensitivity Zones**

highly erodible under several land use situations, including cultivation and grazing. Slopes in the upland areas are steep to very steep, with average gradients ranging from about 3:1 to 1:1. Slope stability in the watershed ranges from dispersed small landslides and moderate susceptibility to failures, to vast areas of nearly continuous large old

landslides that have high susceptibility to reactivation. The Erosion and Land Instability map (Figure 2-2) illustrates those portions of the watershed that are most sensitive to erosion and landslides. The most extensive areas of large landslides and high hazards are in the upper Alameda and Calaveras Reservoir basins. Refer to Appendix C-4 for a discussion of the sediment yields of the watershed.

## 2.3 Hydrology

The Southern Alameda Creek Watershed encompasses 175 square miles, of which 56 square miles or 30 percent is owned by the SFPUC. Arroyo Hondo and Calaveras Creek are the main streams in the southern watershed and are tributaries to Alameda Creek, which flows from its headwaters near Mount Hamilton northward through the Alameda Watershed and the Sunol Valley where it is joined by Arroyo de la Laguna. Alameda Creek then exits SFPUC lands through Niles Canyon. During the winter some of the flow of Alameda Creek water is drawn off via the Alameda Creek Diversion Tunnel into Calaveras Reservoir.

Two reservoirs collect and store water on the Alameda Watershed—San Antonio and Calaveras Reservoirs. The natural drainage basin contributing to the San Antonio Reservoir includes San Antonio Creek, Indian Creek, La Costa Creek, and Williams Gulch. The natural drainage basin contributing to the Calaveras Reservoir includes the Arroyo

Hondo and Calaveras Creek sub-basins and local drainage areas along the west shore, downslope of Monument Peak.

The catchment area for the San Antonio Reservoir is 39.7 square miles. San Antonio Reservoir has a maximum storage capacity of 50,500 acre-feet and stores local runoff, as well as imported water. The catchment area for the Calaveras Reservoir is 100 square miles and has a maximum storage capacity of 96,900 acre-feet.

The Alameda Watershed is divided into the primary watershed which encompasses 30,000 acres and the secondary watershed which encompasses 6,000 acres. This distinction was illustrated in Figure 1-6. The primary watershed includes those lands which are tributary to Calaveras and San Antonio Reservoirs and upon which activities directly affect SFPUC drinking water quality. Lands within the secondary watershed drain into Lower Alameda Creek, and



*Alameda Creek*

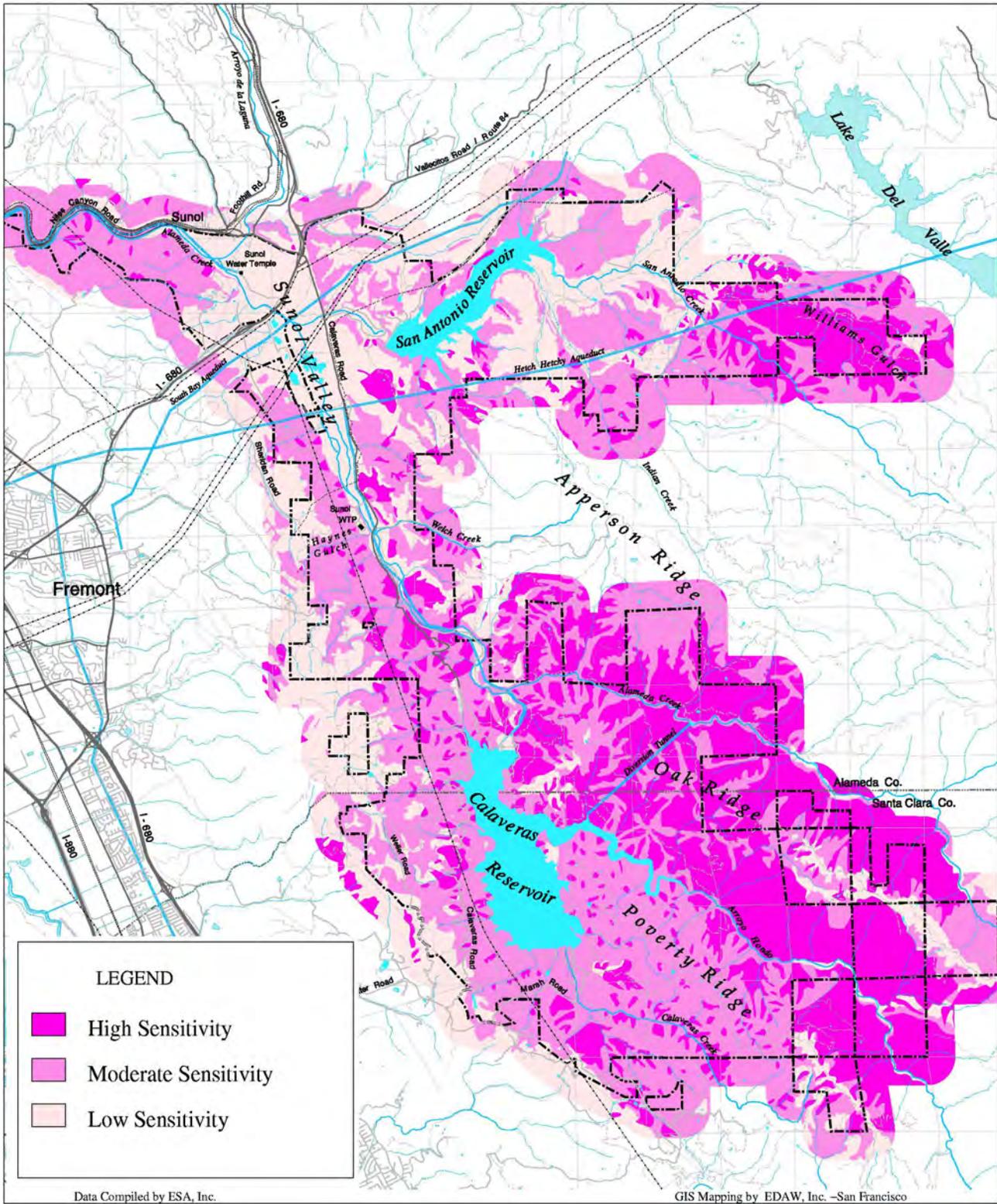


Fig 2-2 Erosion and Land Instability

runoff from these lands does not enter SFPUC reservoirs. The primary watershed lands are most sensitive in terms of water quality protection.

For further information on the San Francisco Water System facilities and practices, refer to Appendix C-2.

## 2.4 Water Quality

The quality of SFPUC water supplies varies according to the source (e.g., imported vs. local surface runoff), storage, and treatment of water. The San Antonio Reservoir receives imported water, and thus the water quality is more variable. Calaveras Reservoir receives only local runoff as inflow, and consequently water quality is relatively consistent. During the late summer and fall, when the Calaveras Reservoir stratifies, hypolimnetic aeration is added to alleviate anoxic conditions and reduce the concentrations of dissolved iron, manganese, and hydrogen sulfide in the raw water. All Alameda Watershed water, whether local or imported, is treated at the Sunol WTP.

*Giardia lamblia* was detected in 3 out of 24 samples collected from Calaveras and San Antonio Reservoirs during 1997, ranging in concentration from 1.0 to 1.5 cysts per 100 liters. *Cryptosporidium* oocysts were not detected in these samples during 1997. More than 95 percent of the total coliform tests throughout the distribution system were negative, complying with the Total Coliform Rule. Review of time series data for San Antonio Reservoir indicates some evidence of increasing levels in chloride, conductiv-

ity, and sodium, likely due to the addition of State Water Project water. Raw water samples have contained sodium levels above the treated water secondary maximum contaminant levels (SMCL); however, there are no data on concentrations subsequent to treatment. Raw water color and pH levels in both Calaveras and San Antonio Reservoirs sometimes exceed the treated water SMCL.

Water Quality Vulnerability Zones (WQVZs) are those areas where activities or disturbance have the greatest potential to impact the water quality of local surface runoff and total water supplies stored in the reservoirs. WQVZs were developed using the following key criteria: proximity to water varied by intensity of rainfall, wildlife concentration areas, vegetation as a protective layer, slope, and soil (as a composite of five soil characteristic parameters). The Composite WQVZ map, shown in Figure 2-3, illustrates those watershed areas with high, moderate, and low vulnerability. Disturbance to areas of the highest vulnerability would result in the greatest risk to water quality. The figure indicates that there are very few areas of low vulnerability and large ar-



*Foothill Oak Woodland*

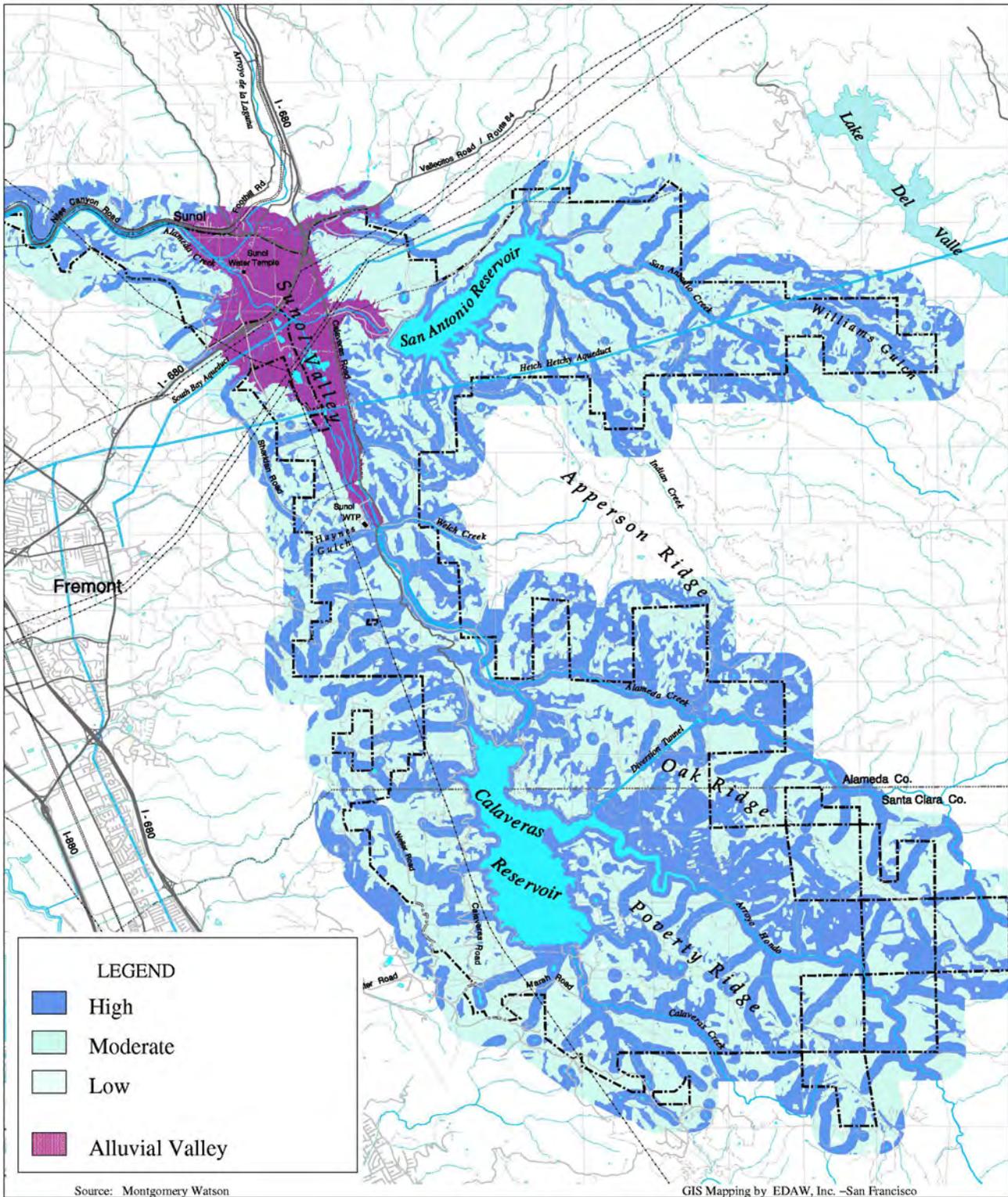
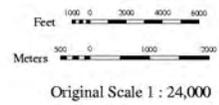


Figure 2-3 Composite Water Quality Vulnerability Zones



areas of high vulnerability, indicating that activities on the watershed, especially in the primary watershed, are likely to have an impact on water quality. Refer to Appendix C-3 for a discussion of Water Quality Vulnerability Zone Development.

The Alameda Watershed includes 30,000 acres of primary watershed and 6,000 acres of secondary watershed. The primary watershed includes areas where

water quality is of the utmost importance as these lands are either tributary to San Antonio and Calaveras Reservoirs or are lands which drain into Alameda Creek above the Proposed Fish Release and Recapture Facility. The secondary watershed lands are lands where runoff enters Alameda Creek below the Proposed Recapture Facility and does not enter SFPUC reservoirs or get recaptured at the Proposed Fish Release and Recapture Facility.

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## 2.5 Vegetation

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Vegetation in the watershed is predominantly grasslands and oak woodland, with brush in the flatter, drier areas. Riparian woodlands, containing Bay laurels and sycamores, are found along the Alameda Creek corridor, San Antonio Creek, and other creek beds.

There are 18 natural community/cover types in the watershed. Figure 2-4 illustrates 13 of these communities as communities with common characteristics have been consolidated. The non-native grassland community is the dominant feature in the Alameda Watershed on flat and gently sloping valleys, particularly on west-facing slopes, while native grassland communities such as perennial needlegrass or bunchgrass have greatly deteriorated. Valley oak is abundant in the vicinity of San Antonio and Calaveras Reservoirs, and integrates with riparian forest near streams in canyons, mixed evergreen forest/coast

live oak woodland in moist areas on slopes, and blue oak in drier areas above 1,000 feet elevation. On north-facing slopes protected by fences or too steep for grazing, grassland has given way to shrubs, including scrub and chaparral communities. Coastal and valley freshwater marsh occurs where streams and arroyos discharge to the reservoirs.

Some plant communities in the Alameda Watershed are currently considered sensitive or rare by the State and/or local counties because of limited distribution locally or regionally. Figure 2-5 illustrates the location of the following significant vegetation communities: valley oak, riparian forest, sycamore alluvial woodland, freshwater marsh, and serpentine associated plants. Thirty-seven plant species that potentially occur in the natural communities of the Alameda Watershed have special status listing at the State or Federal level. Table 2-1

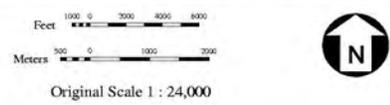
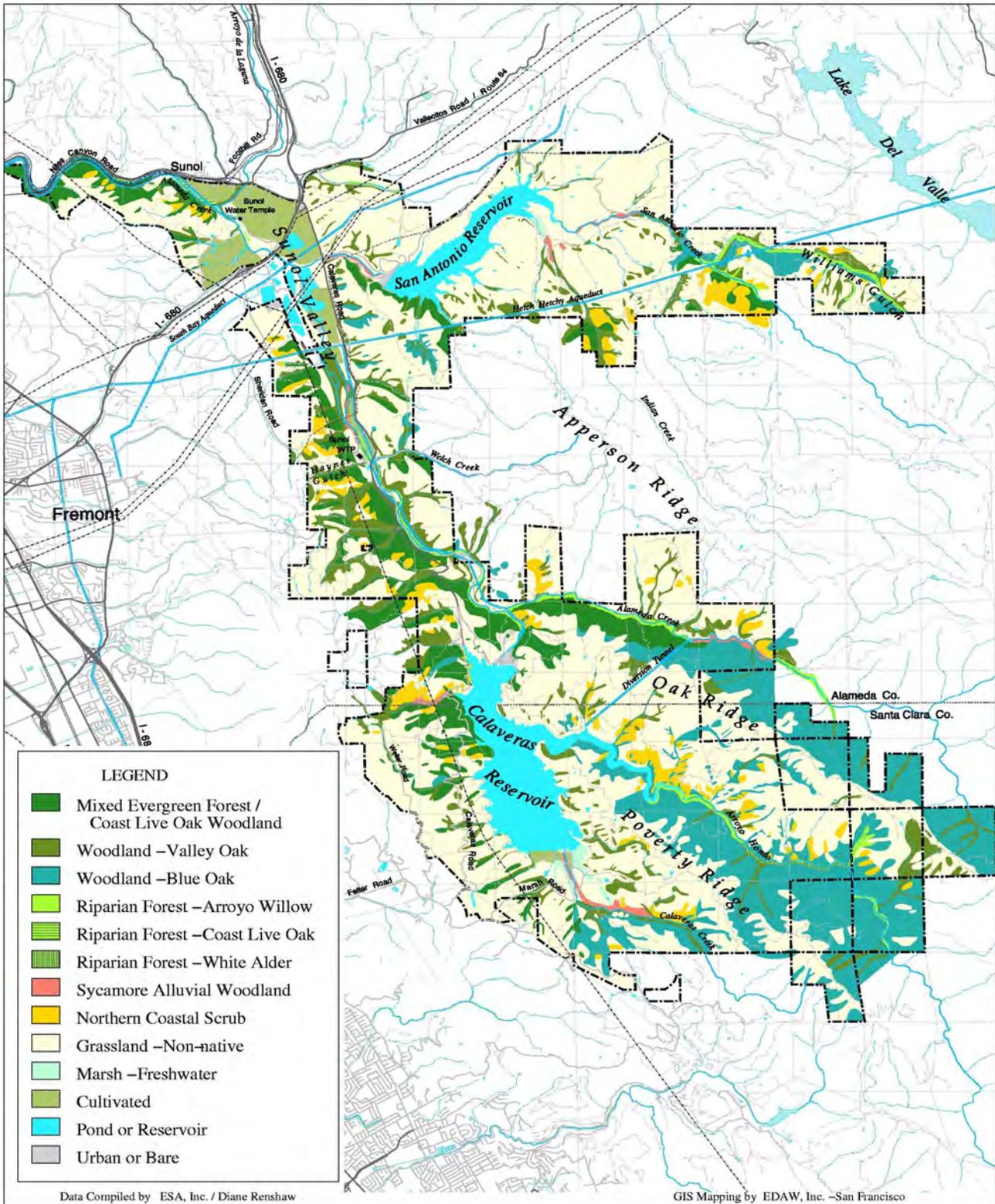


Figure 2-4 Vegetation Communities

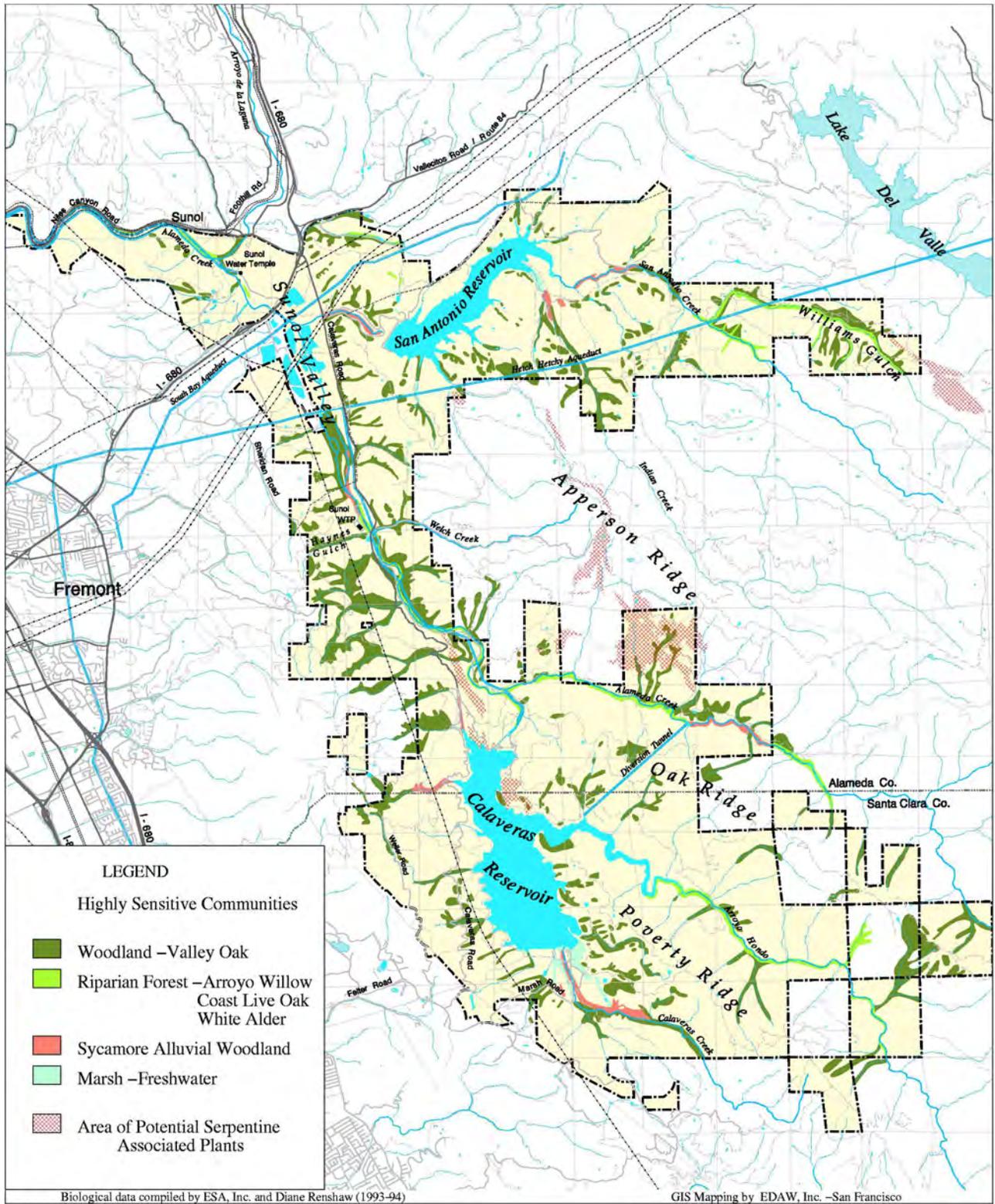


Figure 2-5 Sensitive Vegetation Communities

PLANTS Scientific Name	Common Name	Status* Fed/State/CNPS ****, NA	Habitat	Survey Period	Comments
<i>Acanthomntha lanceolata</i>	Santa Clara thorn mint	F-/S-/List 4	Chaparral, shale scree	March-June	Type Habitat-Calvareras <sup>2</sup>
<i>Balsamorhiza macrolepis var. macrolepis</i>	Balsamroot	F-/S-/List 3	Cismontane woodland, grassland	March-June	Interior slopes near SF Bay
<i>Calochortus umbellatus</i>	Oakland star tulip	F-/S-/4	Chap., con. forest., ultramafic	March-May	In Mt. Hamilton Range <sup>2</sup>
<i>Campanula sharsmithiae</i>	Sharsmith's harebell	FC2/S-/1B	Chaparral, ultramafic talus	May-June?	Mt. Hamilton Range
<i>Cirsium fontinale var. campydon</i>	Mt. Hamilton thistle	FC2/S-/1B	Ultramafic seeps, sandy streams	May-July	Mt. Hamilton Range <sup>2</sup>
<i>Cirsium walkeriaenum</i>	Alameda County thistle	F-/S-/List 4	Broad-leaved upland forest	June-July	<i>C. quercetorum</i> <sup>3</sup>
<i>Clarkia breweri</i>	Brewer's clarkia	F-/S-/List 4	Chaparral, shale talus	April-May	Mt. Hamilton Range <sup>2</sup>
<i>Clarkia franciscana</i>	Presidio clarkia	FC1/SE/1B	Coastal scrub, grassland (ultrama)	May-July	Alameda County <sup>4</sup>
<i>Collomia diversifolia</i>	Serpentine collomia	F-/S-/List 4	Serpentine seeps, streams	May-June	Red Mountains <sup>2</sup>
<i>Coreopsis hamiltonii</i>	Mt. Hamilton coreopsis	FC2/S-/1B	Steep, shale talus, woodland	March-May	Mt. Hamilton Range <sup>2</sup>
<i>Delphinium californicum ssp. interius</i>	Inner Co. Range Larkspur	FC2/S-/List 3	Dry ravines	April-June	Mt. Hamilton Range <sup>2</sup>
<i>Dirca occidentalis</i>	western leatherwood	F-/S-/List 4	Broad-leaved upland forest, chap.	Jan-March	Alameda, Santa Clara Co. <sup>4</sup>
<i>Dudleya setchellii</i>	Santa Clara Valley dudleya	FE/S-/1B	Ultramafic grasslands	May-June	Outside of range
<i>Eriogonum lateolium var. caninum</i>	Tiburon buckwheat	FC3c/S-/4	Ultramafic grasslands and chaparral	June-Sept	Alameda, Santa Clara Co. <sup>4</sup>
<i>Eriophyllum jepsonii</i>	Jepson's woolly sunflower	F-/S-/List 4	Coastal scrub	April-June	Alameda, Santa Clara Co. <sup>4</sup>
<i>Eryngium aristulatum var. hooveri</i>	Hoover's button-celery	FC2/S-/1B	Vernal pools	May-Aug	San Francisco Bay Area <sup>1</sup>
<i>Fritillaria agrestis</i>	stinkbells	FC2c/S-/4	Cismontane woodland, grassland	March-April	Alameda, Santa Clara Co. <sup>4</sup>
<i>Fritillaria falcata</i>	talus fritillary	FC2/S-/1B	Chaparral, woodland, on talus	March-May	Alameda, Santa Clara Co. <sup>4</sup>
<i>Fritillaria liliacea</i>	fragrant fritillary	FC2/S-/1B	Ultramafic scrub and grassland	Feb-April	Alameda, Santa Clara Co. <sup>4</sup>
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE/S-/1B	Moist grasslands, vernal pools	April-May	Alameda, Santa Clara Co. <sup>4</sup>
<i>Lepidium latipes</i>	dwarf pepper-grass	F-/S-/List 4	Ultramafic or alkaline grassland	March-May	Widely distributed in small areas
<i>Malacothamnus arcuatus</i>	arcuate bush mallow	F-/S-/List 4	Chaparral	April-July	Santa Clara Co. <sup>4</sup>
<i>Malacothamnus hallii</i>	Hall's bush mallow	F-/S-/List 4	Chaparral	May-July	Alameda, Santa Clara Co. <sup>4</sup>
<i>Periderma gardneri</i>	Gairdner's yampah	FC2/S-/1B	Broad-leaved upland forest, chap.	June-July	Santa Isabella Valley <sup>2</sup>
<i>Phacelia phacelioides</i>	Mt. Diablo phacelia	FC2/S-/1B	Cismontane woodland, chaparral	April-May	Alameda, Santa Clara Co. <sup>4</sup>
<i>Plagiobothrys myosotoides</i>	Forget-me-not popcorn fl.	F-/S-/List 3	Chaparral	April-May	Ridge-top in Mt. Ham. Rn <sup>2</sup>
<i>Quercus lobata</i>	Valley oak	F-/S-/List 4	Widespread on alluvial terraces		ESA 1993, Corelli 1992
<i>Ranunculus lobbii</i>	Lobb's aquatic buttercup	F-/S-/List 4	Ponds, pools, watering holes	Feb-April	Alameda, Santa Clara Co. <sup>3</sup>
<i>Ribes divaricatum var. pubiflorum</i>	straggly gooseberry	F-/S-/List 4	Broad-leaved upland forest	March-May	Alameda, Santa Clara Co. <sup>4</sup>
<i>Sanicula saxatilis</i>	rock sanicle	FC2/SR/1B	Broad-leaved upland forest, chap.	May-June	Santa Clara Co. <sup>4</sup>
<i>Streptanthus albidus ssp. albidus</i>	Metcalf Cyn jewelflower	FE/S-/1B	Serpentine grassland, barrens	April-June	Santa Clara Co. <sup>4</sup>
<i>Streptanthus albidus ssp. peramoenus</i>	uncommon jewelflower	FC1/S-/1B	Serpentine grassland, chaparral	April-June	San Francisco Bay Area <sup>1</sup>
<i>Streptanthus callistus</i>	Mt. Hamilton jewelflower	FC2/S-/1B	Shale talus	April-May	Endemic, Arroyo Bayo <sup>2</sup>
<i>Streptanthus hispidus</i>	Mt. Diablo jewelflower	FC2/S-/1B	Grassland	March-June	Endemic, Mount Diablo <sup>4</sup>
<i>Stylocline amphibola</i>	Mt. Diablo cottonweed	F-/S-/List 4	Broad-leaved upland forest, chap.	April-May	Alameda Co. <sup>4</sup>
<i>Trifolium amoenum</i>	showy Indian clover	FC2/S-/1A	Grasslands	April-May	Alameda, Santa Clara Co. <sup>3</sup>
<i>Tropidocarpum capparideum</i>	caper-fruited tropidocarpum	FC2/S-/1A	Alkaline hills, grasslands	March-April	Alameda, Santa Clara Co. <sup>4</sup>

KEY:

**Federal Listing Categories**

- U.S. Fish & Wildlife Service
- FE=Federal Endangered
- FT=Federal Threatened
- FC1=Candidate info. indicates listing may be appropriate, data on file at present time.
- FC2=Candidate info. indicates listing may be appropriate, supporting data not on file.
- FC3a=Non-candidate; previously candidate but now believed extinct.
- FC3b=Non-candidate; previously candidate but now considered an invalid taxon.
- FC3c=Non-candidate; previously a candidate but now not threatened.

**State Listing Categories**

- CE=California Endangered
- CT=California Threatened
- CR=California Rare

Note: California has also listed species of special concern and they are marked "CSC" but have no legal status except under CEQA.

**Private Sector Interest Groups**

**California Native Plant Society (CNPS) Lists**

- List 1A=Plants presumed extinct in California.
- List 1B=Plants rare and endangered in California, more common elsewhere.
- List 2=Plants endangered in California, more common elsewhere.
- List 3=Plants about which more information is needed
- List 4=Plants of limited distribution (a "watch list").

References:

- <sup>1</sup>CNDDDB Rarefind printout Special Plant Element List, August 1991.
- <sup>2</sup>Sharsmith, H., Flora of the Mount Hamilton Range of California, California Native Plant Society, No. 6, 1982.
- <sup>3</sup>Hickman, J.C. (ed.) 1993. The Jepson Manual Higher Plants of California. University of California Press, Berkeley, California.
- <sup>4</sup>Smith, J.P. and K. Berg (eds.), Inventory of Rare and Endangered Vascular Plants of California, California Native Plant Society, Sacramento, California, and Schauss, M. and T. Corelli, San Francisco Water Department Wild Pig Survey: Calaveras and San Antonio Reservoir Watersheds, 1992.

Source: Alameda Watershed Natural and Cultural Resources, 1994.

**Table 2-1 Special Status Plant Species Reported from the Vicinity of the Alameda Watershed**

lists special status species potentially occurring on the watershed. For further information on the ecological resources

of the watershed, refer to the Natural and Cultural Resources study in Appendix A-4.

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## 2.6 Wildlife

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The Mt. Diablo Range separates the Bay Area coastal habitats from the interior San Joaquin Valley habitats. Ridgelines and open water within the Alameda Watershed are important features of the Pacific Flyway. The watershed provides winter foraging and resting habitat for migrating and resident bird species, attracting raptors (birds of prey), waterfowl, and passerines (perching birds). The watershed also provides habitat for tule elk, black-tailed deer, and feral swine. The watershed acts as a buffer between the surrounding urban areas and the many square miles of open space and wildlife habitat to the east.

Wildlife habitats include non-native grasslands on south-facing slopes; coast live oak woodland in ravines that feed into the reservoir; blue oak woodlands on north-facing slopes; coastal scrub on south-facing slopes; and riparian areas along the major creeks and tributaries

to the reservoir. Figure 2-6, Sensitive Wildlife Habitats and Species, illustrates those highly sensitive habitats occurring on the watershed. Research indicates that there is good potential habitat within the watershed for a number of special status or legally protected animal species that are known to occur near the watershed. Reported locations of special status species are illustrated in Figure 2-6, and include species such as the California red-legged frog, western pond turtle, great blue heron, golden eagle, and Cooper's hawk.

The combination of sensitive animal communities and special status animal species, along with sensitive vegetation communities and special status plant species, forms the Composite Ecological Sensitivity Zones. Shown in Figure 2-7, this map illustrates those ecological resource areas of the watershed with high, moderate, and low sensitivity.



*Sunol Water Temple*

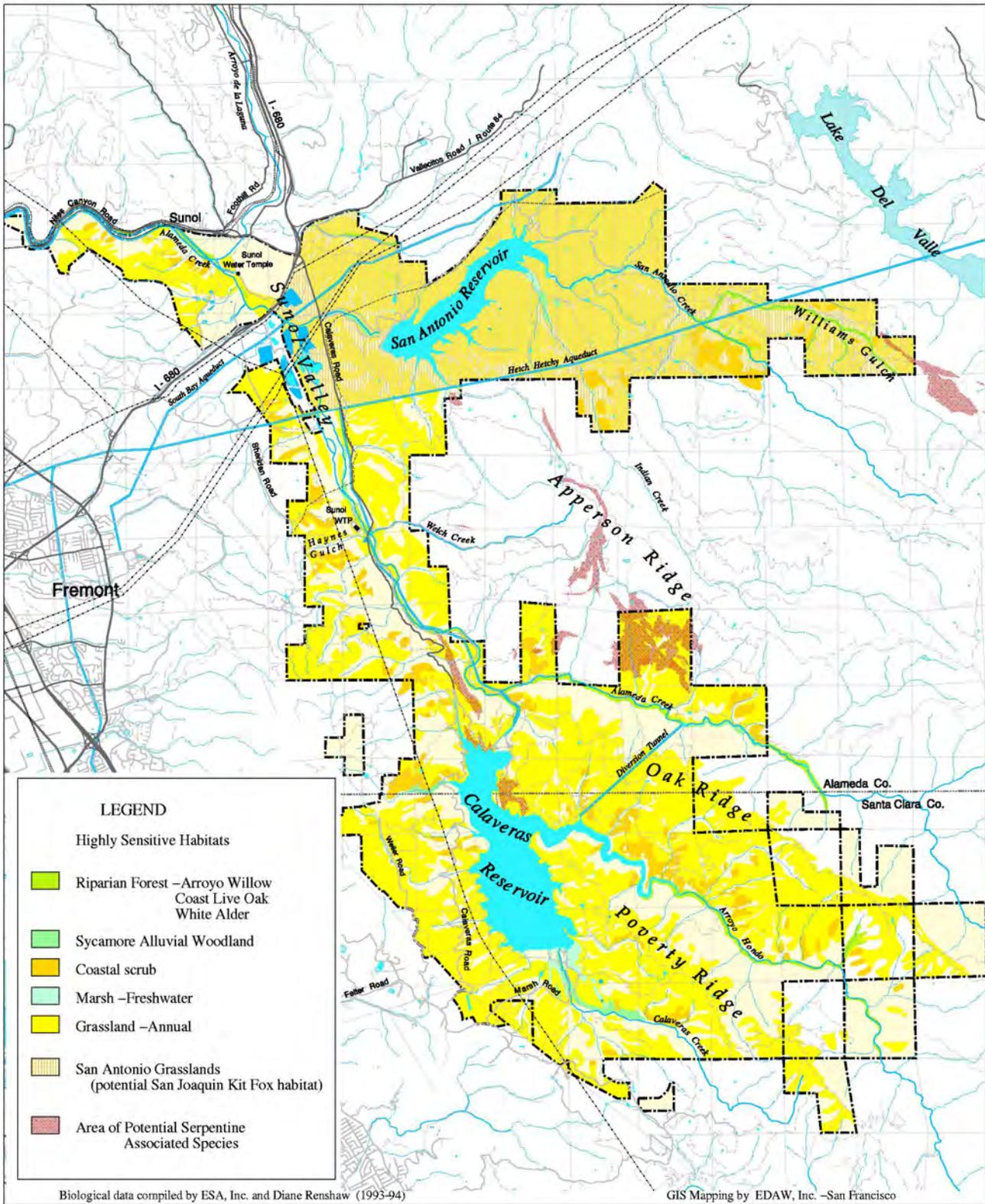
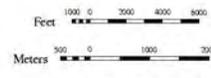


Figure 2-6 Sensitive Wildlife Habitats and Species



Original Scale 1 : 24,000

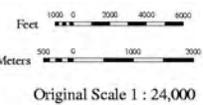
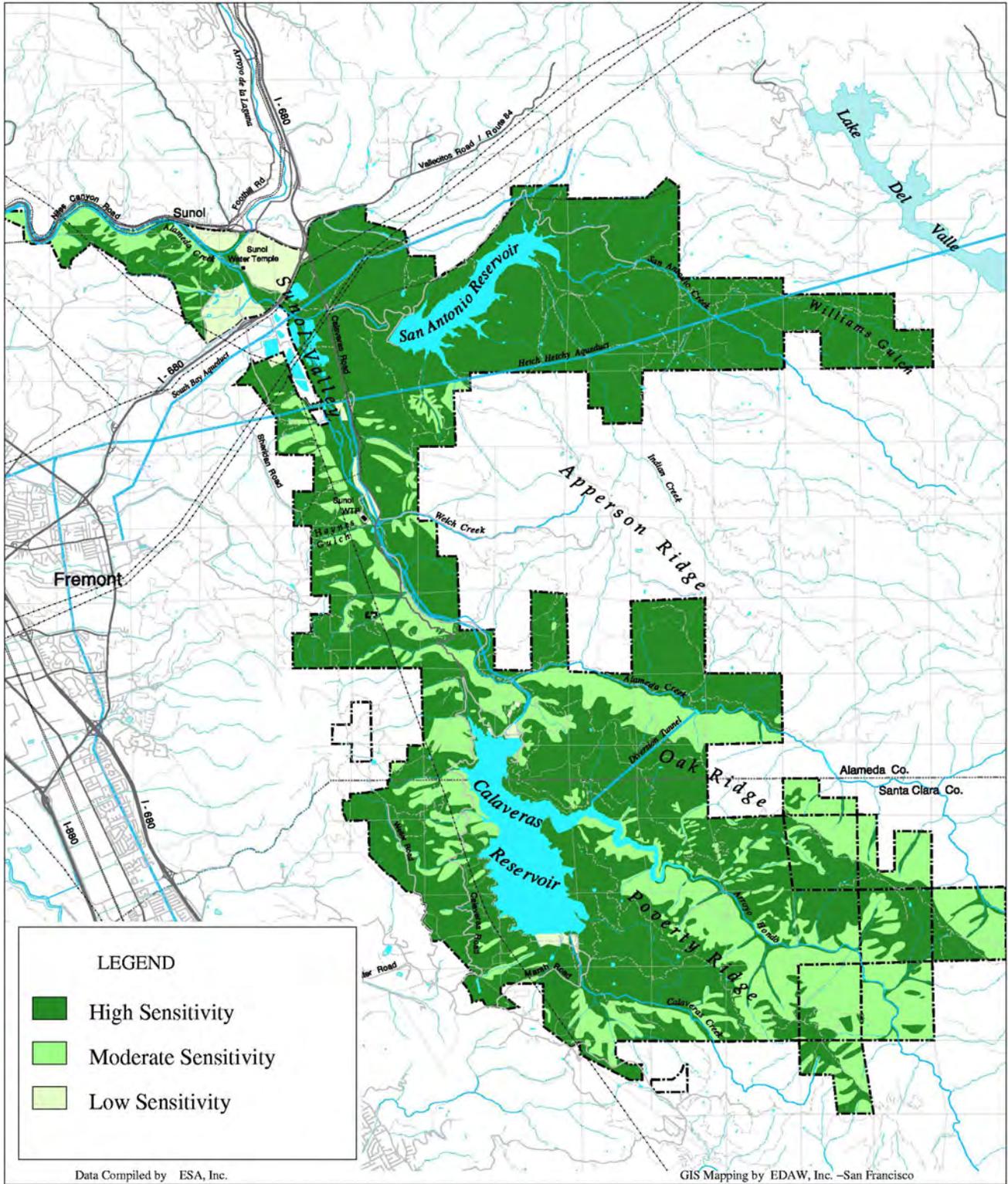


Figure 2-7 Composite Ecological Sensitivity Zones

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## 2.7 Fisheries

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Tributary streams to Calaveras and San Antonio Reservoirs contain native and non-native warmwater fishery resources such as minnows, suckers, catfish, bass, and sunfish. Native warmwater fish species have declined over time. Many Bay Area watershed tributary streams contain trout. Anadromous steelhead runs have also declined due to fish passage barriers and urbanization.

Important and sensitive fishery resources that exist in the watershed in-

clude the anadromous steelhead trout, the resident rainbow trout, and native non-game fish. Downstream of SFPUC lands, a “put-and-take” rainbow trout fishery was established in the Niles Canyon area of Alameda Creek in 1974, with annual trout plants of 30,000 fish. For further information on fisheries, refer to the Natural and Cultural Resources study in Appendix A-4.

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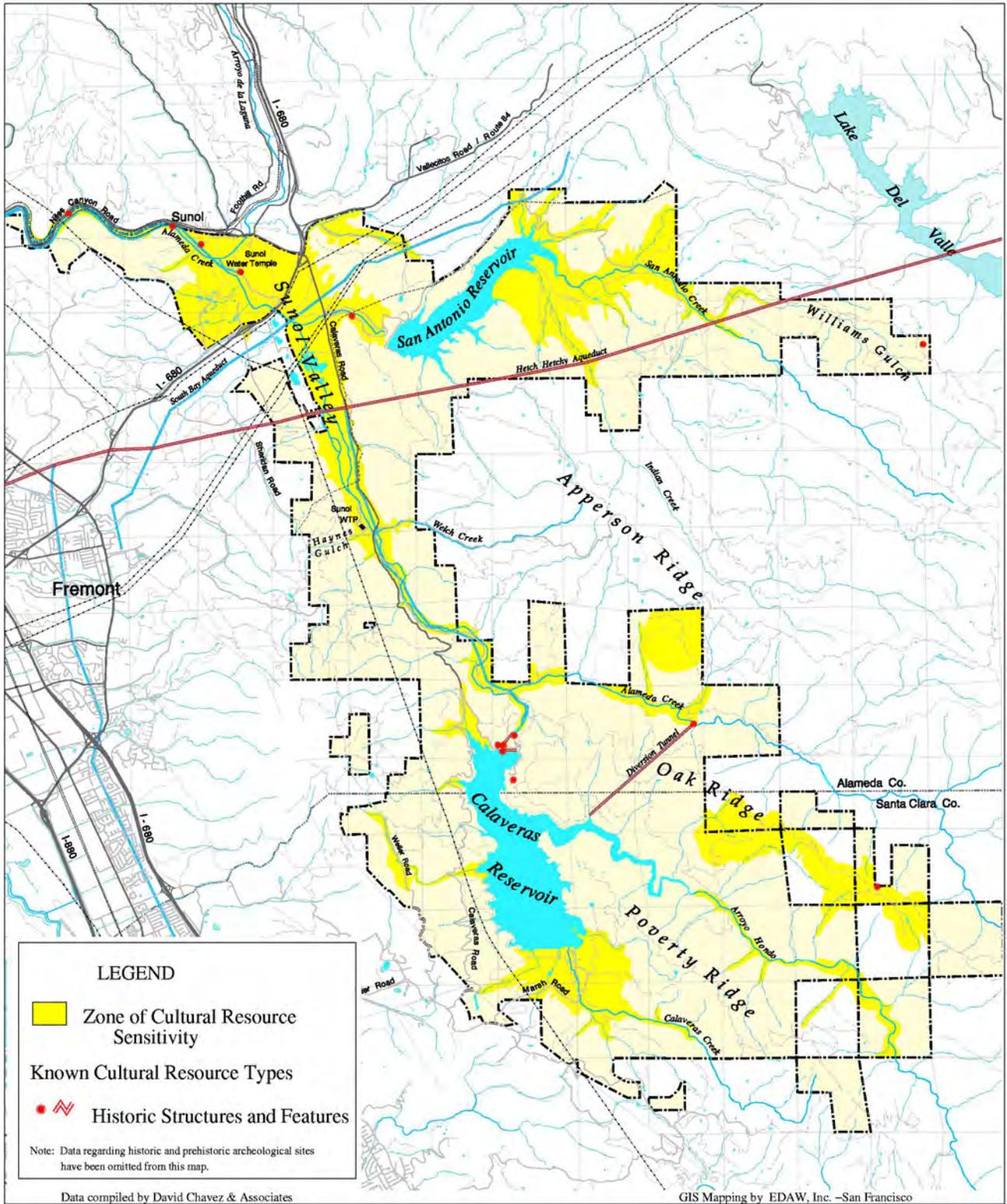
## 2.8 Cultural Resources

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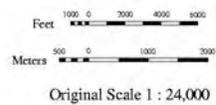
Archaeological evidence suggests that the Alameda Watershed region was a favorable locale for permanent as well as seasonal habitation from prehistoric times up to the ethnohistoric period (circa A.D. 1769). The numerous creeks in Sunol Valley and Alameda Creek are excellent locations for potential prehistoric and ethnohistoric resources. Remote areas such as the upper La Costa Valley, in the vicinity of San Antonio and Indian Creeks, offer good locations for potential archaeological resources. The upper Calaveras Valley, at the south end of the watershed, could contain additional resources as well.

Preliminary historical review for the Alameda Watershed suggests that the

major historical periods include the Spanish Exploration/Mission, Mexican Rancho, American, and Spring Valley/San Francisco Water Department eras. Numerous historic archaeological sites and historic features and structures associated with most of these periods are located throughout the Alameda Watershed. Figure 2-8 illustrates zones of cultural resource sensitivity as well as historic places and structures. Known historic structures and features include wells, reservoirs, dams, tunnels, and the Sunol Water Temple. There are no watershed resources currently listed on the National Register of Historic Places (NRHP). For further information, refer to the Natural and Cultural Resources study in Appendix A-4.



**Fig 2-8 Cultural Resources and Potential Sensitivity Zones**



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## 2.9 Aesthetics

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For the most part, the watershed is relatively remote and not accessible to or viewed by the general public; however, several major roads such as I-680 and State Route 84 do provide viewing opportunities for a limited portion of the watershed. Particular features of interest include views of Calaveras Reservoir, the Sunol Water Temple, the Little

Yosemite area, and the narrow and heavily forested Niles Canyon. Key observation points are offered from the following: I-680, Calaveras Road, Vallecitos Road, Geary Road, Mill Creek Road, and Sunol Water Temple. For further information on aesthetics of the watershed, refer to the visual resources technical memorandum in Appendix C-5.

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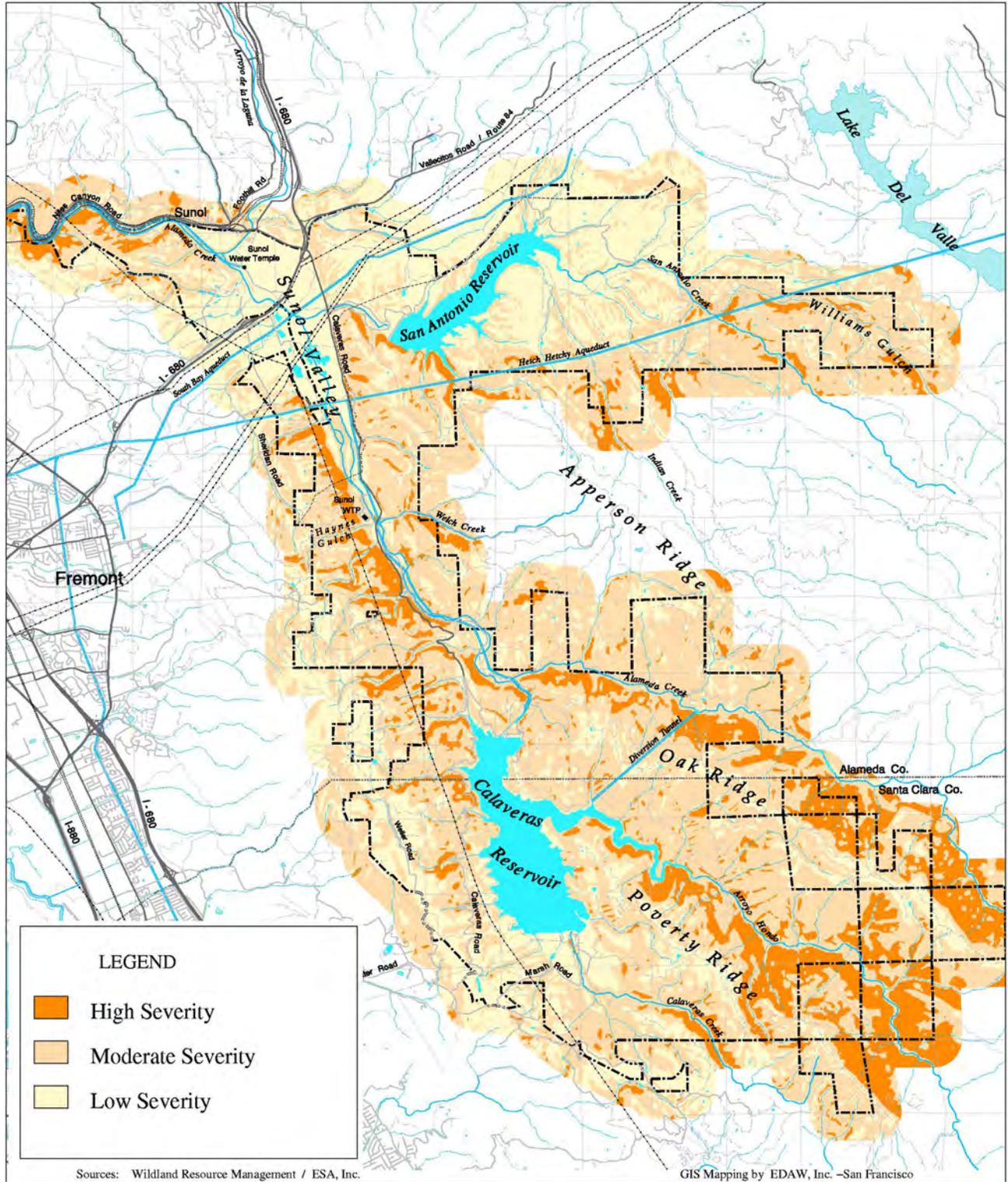
## 2.10 Fire Hazard

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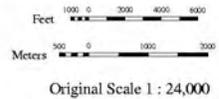
The Alameda Watershed's Mediterranean climate is characterized by long, dry, hot summers that promote a high chance of ignition, and by vegetation that is extremely drought resistant and adapted to frequent fires. Grassland coverage promotes the likelihood of fires since grass is easily ignited. In addition, the sloping terrain of the watershed is conducive to fire. The expanding areas of residential development adjacent to the watershed raise concerns regarding the values which could be damaged by a fire. This adjacent development creates additional potential ignition sources. In addition to development, other ignition sources include recreational use of the EBRPD Sunol Wilderness and roadside igniting from Calaveras Road.

The watershed is generally shielded from view with respect to surrounding population centers, and thus concerns regarding fire and aesthetic quality are low. The watershed is likewise shielded from strong prevailing westerly winds. As true of all SFPUC lands, the impacts of fire on water quality and quantity are of greatest concern. For further information on fire hazards associated with the watershed, refer to the Fire Management Element in Appendix A-1.

Figure 2-9 shows the Wildfire Severity map, which illustrates the potential severity of wildfires as a measure of dwelling density, slope, vegetation as a fuel source, and fuel hazard rating as established by the Bates Bill (AB 337).



**Fig 2-9 Wildfire Severity**



## 2.11 Land Status and Adjacent Uses



*EBRPD Sunol Regional Park - Leased Lands*

The SFPUC's Alameda Watershed holdings encompass only 30 percent of the entire hydrologic watershed. Therefore, activities which occur within the greater hydrologic watershed but outside of the SFPUC holdings can affect SFPUC water quality.

Communities adjacent to the Alameda Watershed include Milpitas (population 59,300) and Fremont (population 185,300) to the west, and Pleasanton (population 58,200) and Livermore (population 66,000) to the northeast (population figures are for 1995 and were provided by the Association of Bay Area Governments [ABAG]). Lands to the south and east are generally unincorporated ranchlands; however, these lands are under residential development pressure. The unincorporated town of Sunol adjoins the northern boundary of the watershed.

The 36,000-acre Alameda Watershed is split between Alameda County (23,000 acres) and Santa Clara County (13,000 acres). Alameda County has a total population of 1,364,000, which is expected to increase by 17 percent in the next 20 years (ABAG 1994). Santa Clara County has a total population of 1,611,200, which is expected to increase by 17 percent in the next 20 years.

The General Plans for Alameda and Santa Clara Counties have assigned

land use designations for SFPUC watershed lands. The Alameda East County Area encompasses 418 square miles and includes the cities of Livermore, Pleasanton, Dublin, the town of Sunol, and a portion of Hayward, as well as surrounding unincorporated areas. SFPUC-owned lands within Alameda Watershed are zoned as Resource Management/Watershed Protection under the Alameda East County Area Plan. Alameda County also recently identified portions of the Sunol Valley as an agricultural enhancement zone. This designation allows for subdivision of large parcels into 20-acre homesites each with an agricultural component. SFPUC-owned watershed lands within Santa Clara County are classified as Resource Conservation Area/Other Public Open Land in the Santa Clara County General Plan.

Land uses north of the watershed include the Vallecitos Atomic Laboratory, and the Castlewood Country Club and Golf Course, founded in the early 1900s and located along Arroyo de la Laguna or property, which is now under a mixed use development and annexation to the City of Pleasanton. The Union Pacific Railroad Line, on which trains run daily, is located along the northwest border.

The EBRPD's Sunol Regional Wilderness is located on the eastern border of the watershed. In the Milpitas area, ad-

adjacent to the southwest boundary of the watershed, homes continue to be built in the hills. For further information on

adjacent land uses, refer to General Plans Review in Appendix C-9.

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## 2.12 Transportation and Access

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A total of 51 miles of paved roads and 106 miles of unpaved roads and trails have been identified on the Alameda Watershed through GIS analysis. The road system consists of approximately 6 miles of Interstate highway and ramps, 11 miles of state highways, 34 miles of paved roads and streets, 82 miles of unpaved roads, and 24 miles of trails.

The major transportation corridor near the Alameda Watershed is I-680. About

2 miles of I-680 traverse the watershed. The Pleasanton-Sunol and Highway 84-Calaveras Road interchanges provide local access to watershed areas. Limited-access dirt roads are used for fire access, maintenance, and security purposes. There is one active railroad track operated by Union Pacific that bisects the watershed.



*Sunol Valley Lease Activities*

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## 2.13 Utilities

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Within the watershed, underground petroleum and natural gas pipelines are operated by utilities and private companies. The Chevron Pipeline Company operates a pipeline for the transport of refined petroleum products that runs through the San Antonio Reservoir watershed and then crosses Alameda Creek in the Sunol Valley, for a total distance of about 8 miles within the watershed. Pacific Gas and Electric (PG&E) operates natural gas and electrical transmission lines in two corridors west of

Calaveras Reservoir, and three high pressure natural gas transmission lines in the San Antonio Valley.

In addition, the Hetch Hetchy electrical transmission lines cross through watershed lands west of San Antonio Reservoir and Sunol Valley. The Hetch Hetchy Aqueduct is underground in the southeast part of the watershed. Refer to the Utilities and Infrastructure Review, Appendix C-10, for further information.

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## 2.14 Operations and Maintenance

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SFPUC operations within the watershed include land maintenance and/or construction which must occasionally be performed. The watershed is patrolled by SFPUC staff. SFPUC operates boats on the two reservoirs for use in patrolling and maintaining the reservoirs. SFPUC also operates the Sunol WTP

adjacent to Alameda Creek and an operations and maintenance yard in the Sunol Valley. In addition, resource management activities performed by the SFPUC include fire management, exotic species control, rodent control, erosion control, and road maintenance.

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## 2.15 Recreation

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Public recreational opportunities on the Alameda Watershed include those at the Sunol Regional Wilderness and Ohlone Regional Wilderness. Individual access to existing internal Watershed roads and fire roads is not permitted. Existing recreational uses are located primarily in the central and northern portions of the Watershed. SFPUC currently leases approximately 3,800 acres to the East Bay Regional Park District (EBRPD) as part of the 6,858 acre Sunol Regional Wilderness.

The Sunol Regional Wilderness includes more than 26 miles of hiking, equestrian, and biking trails. EBRPD facilities include picnic areas, group and backpack camps, a visitor's center, and equestrian facilities.

The Ohlone Regional Wilderness is located to the east of the Sunol Regional Wilderness and currently contains 9,736 acres of land and has more than 42 miles

of hiking and equestrian trails. EBRPD facilities include backpack camps and Camp Ohlone, a group camp (by reservation).

Collectively, the Sunol Regional Wilderness and the Ohlone Regional Wilderness are known as the Sunol-Ohlone Regional Park. Approximately 200,000 persons per year use the combined recreation areas. The intention of this Plan is to provide for the continuation of trail uses on the trails managed by EBRPD. Trails on the Watershed are rugged; therefore, the intensity of use is low during the hot, dry summer. The Sunol Valley Golf Course is located in the northern portion of the Watershed, north of I-680, and is used by approximately 88,000 persons per year.

Recreational facilities adjacent to the Alameda Watershed include the following:

- Pleasanton Ridge Regional Park (3,999 acres) - EBRPD lands located off Foot-hill Boulevard north of Sunol; developed with 20 miles of hiking, equestrian, and biking trails. Facilities include picnic areas and equestrian facilities.

- Del Valle Regional Park (4,311 acres) EBRPD lands located on Del Valley Blvd., south of Mines Road; developed with camping, swimming, picnic areas, and windsurfing and boating facilities as well as more than 20 miles of hiking, biking and equestrian trails. This park is contiguous with the Sunol-Ohlone Regional Park.

- Mission Peak Regional Preserve (2,999 acres) - EBRPD lands located off Mill

Creek Road, off Mission Boulevard in Fremont; developed with more than 20 miles of hiking, biking and equestrian trails. Facilities include picnic areas and equestrian facilities. This preserve is contiguous with the Sunol-Ohlone Regional Park.

Ed R. Levin County Park (1,544 acres) - Santa Clara County lands located off Calaveras Road in Milpitas; developed with 15 miles of hiking and equestrian trails as well as boating, fishing and volleyball facilities. Spring Valley Golf Course is also located within this park.

For further information on recreation, refer to in Appendix C-11.

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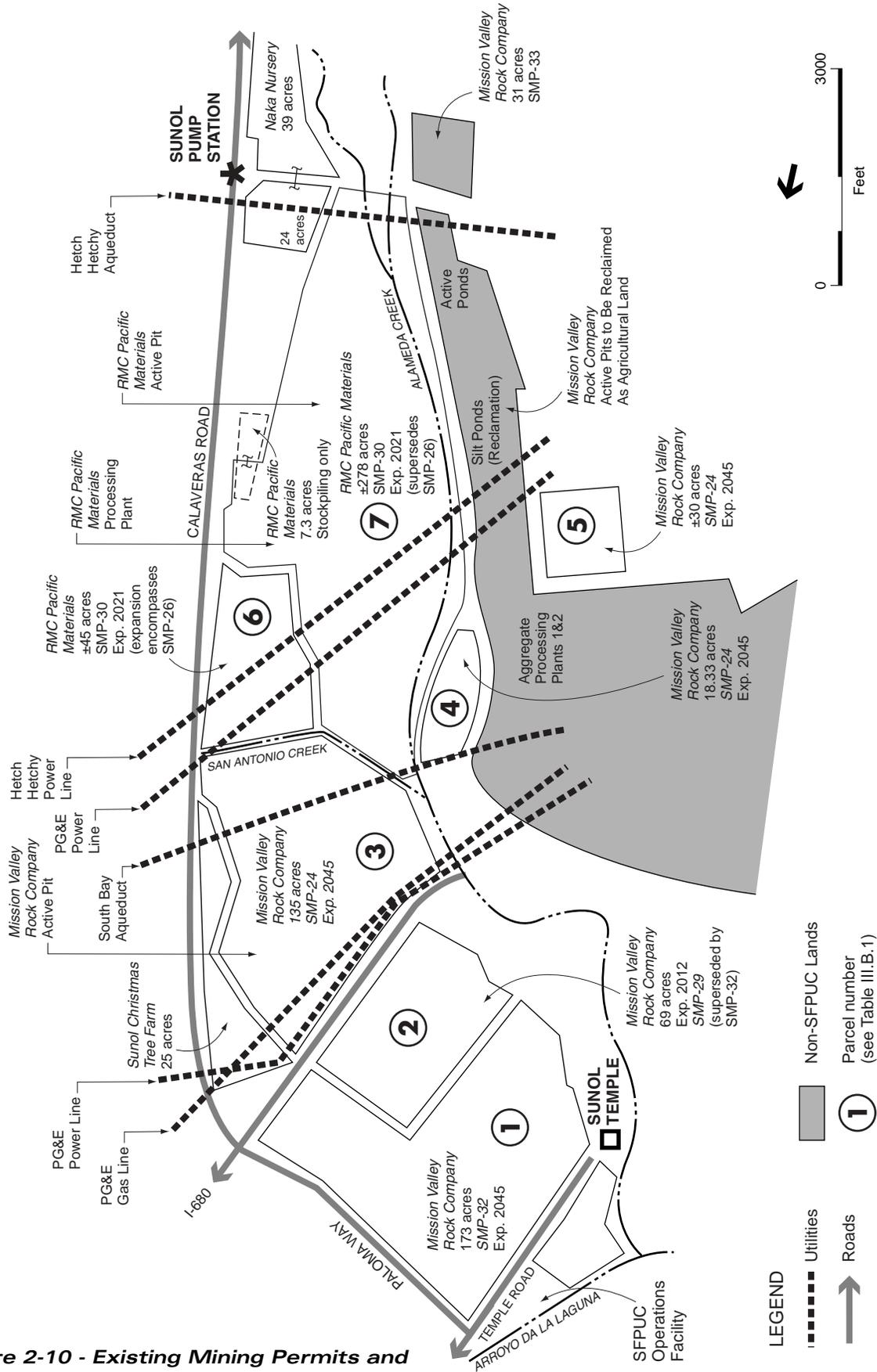
## 2.16 Gravel Mining & Other Watershed Activities

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Principal land uses and/or activities within the primary and secondary Alameda Watershed include: utility, automobile, and railroad corridors; SFPUC operations and resource management activities; recreation areas; access by permits and leases; trespassing; residential land uses; livestock grazing; nurseries; closed industrial facilities; sanitary facilities; and wildlife and livestock activities. Quarry activities and golf course areas occur only in the secondary watershed. Changes to land uses in or adjacent to the watershed that are currently being planned for by local land use agencies (via General Plans,

permits granted, or other steps undertaken) include development of the Apperson Ridge quarry in the San Antonio Watershed, urban development of residential lands upstream of Calaveras Reservoir in Santa Clara County, consideration of portions of the Sunol Valley as an agricultural enhancement zone, and recent considerations for residential development and a toll road along Highway 84 within the hydrologic watershed of San Antonio Reservoir.

Figure 2-10 shows existing mining permits and activities in Sunol Valley as of April of 1996.



**Figure 2-10 - Existing Mining Permits and Activities in Sunol Valley (as of April 1996)**

Alameda Watershed Management Plan EIR / 930385

SOURCE: EDAW, Inc., 1998, Environmental Science Associates.

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## 2.17 Revenue Generation

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In addition to earning revenues from city and suburban water sales, SFPUC earns revenue on a number of permits and leases for activities on SFPUC-owned watershed lands. There are two forms of lease agreements: agricultural leases and non-agricultural leases, as well as revenue-producing land use permits. Generally, leases have a longer term than permits, which are generally issued for one year and must be renewed annually. Agricultural leases include grazing, nursery and agricultural uses, and some recreation activities. These leases cover a total of approximately 30,124 acres and in fiscal year (FY) 1999-2000 generated approximately \$355,442 in revenue.

Non-agricultural leases include those for gravel mining, recreation, and commercial operations. These activities occur on approximately 4,051 acres of the watershed and in FY 1999-2000 generated approximately \$2,859,299 in revenue.

Revocable land use permits are granted for activities similar to the agricultural leases— grazing, nurseries, and agricultural activities, as well as recreational and commercial activities. These permits are granted for approximately 1,068 acres and in FY 1999-2000 generated approximately \$14,629 in revenue. Refer to Appendix C-7 for further information on this topic.

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## 2.18 Existing Codes and Regulations

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Certain Federal and State codes and regulations apply to the management of the watershed. The following is a summary of applicable regulations.

### 2.18.1 Environmental Review

Three levels of environmental review are possible for actions on the Alameda Watershed, based on CEQA and the National Environmental Policy Act (NEPA). CEQA review is generally sufficient for all programs/projects unless there is a proposed Federal action, in which case NEPA analysis is required.

Under CEQA, both programmatic and project-level reviews are possible. Programmatic review generally applies in cases such as the Alameda Watershed Management Plan where a broad set of actions and policies that are related geographically are being proposed. Project-level analysis is generally conducted on a site-specific action such as the construction of a new building or golf course. NEPA review occurs when there is a proposed Federal action. The following sections describe the CEQA program-level and project-level review processes, as well as the NEPA review processes in greater detail.

### ***CEQA Program-Level Review***

The Alameda Watershed Management Plan is subject to environmental review under CEQA (Section 15378 of the CEQA Guidelines). The City and County of San Francisco is the “Lead Agency” (i.e., the government agency which has the principal responsibility for approving the Plan). As Lead Agency, the Office of Environmental Review (OER) will oversee the preparation of the required CEQA environmental review, including determination of what level of environmental review is required. In its administration of CEQA, OER has determined that the Plan requires the preparation of a Program-level EIR to be prepared in accordance with State CEQA Guidelines Section 15168 and 15120 et seq.

A program EIR is appropriate for this project because the Alameda Watershed Management Plan constitutes a series of actions that can be characterized as one large project which is related: “..a) geographically; b) as logical parts in a chain of contemplated actions; and c) in connection with the issuance of...plans...to govern the conduct of a continuing program..” [Section 15168(a), State CEQA Guidelines].

Program-level EIRs are commonly used by government agencies for projects similar to the adoption of this Plan. Advantages associated with preparing a program-level EIR include: it offers the Lead Agency and the public an oppor-

tunity to see the overall impacts of the program; ensures consideration of cumulative impacts that might be slighted if considered on a case-by-case basis; avoids duplicative reconsideration of basic policy considerations; allows the CCSF to consider broad policy alternatives and program-wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts; and allows reduction in paperwork.

As a program EIR, the document will identify the anticipated program-wide environmental impacts and mitigation measures, including a description of the current environmental conditions within the study area and identification of the potential environmental impacts that could result from implementation of the Plan. Impacts deemed significant will be reduced to an insignificant level by modifying the Plan to reduce or avoid impacts, and by implementing measures to mitigate impacts. This process allows the decision-makers the flexibility to refine the Plan (and/or develop mitigation measures) as the environmental analysis occurs, thereby enhancing their ability to put forth an environmentally sustainable Plan.

### ***CEQA Project-Level Review***

Following certification of the program-level EIR and adoption of the Plan, additional environmental analysis may be

required prior to implementation of individual projects. Such projects include those that would have effects not specifically or comprehensively examined within the scope of this program-level EIR, including construction and operation of projects proposed by private entities (e.g., a golf course) which would require approval/discretionary action by the CCSF. In addition, some SFPUC activities which require approval from another agency, such as dredging or controlled burn operations, may be subject to subsequent CEQA review.

The level of subsequent environmental review needed would be determined by the CCSF (or other government agency charged with approval authority - i.e., issuance of a permit) on a case-by-case basis. Such review may include the preparation of a Subsequent EIR or simply an Initial Study/Negative Declaration. All subsequent analysis would tier off of the program-level EIR wherever feasible. To “tier off” means that the subsequent analysis would rely on information and/or incorporate by reference the analysis provided in the program-level EIR, including use of existing conditions, cumulative impacts, growth inducement, and other sections as appropriate. In so doing, the CCSF can effectively streamline and reduce the amount of paperwork needed for the required environmental review process.

### ***NEPA Review***

The National Environmental Policy Act of 1969 is the Federal equivalent of

CEQA. As such it is administered by Federal agencies and would be applicable to the watershed if activities were proposed which were either financed, assisted, conducted, or approved by a Federal agency. For example, issuance of a discretionary permit from a Federal agency, such as the Army Corps of Engineers (COE), National Park Service (NPS), or the U.S. Fish and Wildlife Service (USFWS), may trigger the need for environmental review under NEPA.

In general, the requirements of NEPA and CEQA are very similar, although NEPA places greater emphasis on alternatives’ development and analysis, and socioeconomic/environmental justice effects (the latter of which are not required by CEQA). In the event that NEPA documentation was required for a specific watershed activity, the information and environmental analysis provided in the program-level EIR prepared for the Alameda Watershed Management Plan may be used where feasible. It should be noted, however, that the responsibility and oversight of NEPA compliance would be that of the Federal “Lead Agency” and not the CCSF, unless the City reached agreement regarding joint lead agency status with the Federal agency.

### **2.18.2 Other Relevant Codes & Regulations**

In addition to the environmental review requirements described above, implementation of individual programs or ac

tivities may be subject to the review and approval (i.e., issuance of a permit) of a government agency other than the City and County of San Francisco.

Many of SFPUC’s standard operation and maintenance practices, as well as new activities or periodic uses, may be regulated by agencies other than the SFPUC. This “regulation” ranges from review authority to formal consultation to permit approval. A list of the primary agencies which may have this purview over watershed activities is provided below, followed by a summary of the activities that would trigger the need for their review/permit approval.

**Federal**

U.S. Fish and Wildlife Service  
U.S. Army Corps of Engineers

**State**

Alquist-Priolo Fault Hazard Act  
California Department of Fish and Game  
California Department of Forestry and Fire Protection  
California Department of Health Services

California Department of Pesticide Regulation  
California Department of Transportation  
California Department of Water Resources  
Division of Safety of Dams  
State Office of Historic Preservation  
State Water Resources Control Board

**Regional**

Bay Area Air Quality Management District  
Regional Water Quality Control Board

Activities that may trigger the need for a permit or other review by the agencies listed above include: activities which may affect a Federal or State-listed species; application of pesticides; dredging; dam maintenance; construction activities which would emit pollutants into the atmosphere or disturb more than 5 acres; controlled burns; activities conducted within a state highway right-of-way; and/or alteration of jurisdictional wetland (Federal) or streambed (State).

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**2.19 Related SFPUC Projects and Studies**

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**2.19.1 Alameda Creek Water Resources Study**

The Alameda Creek Water Resources Study (ACWRS) was initiated in August 1992 and completed in January 1995. The ACWRS was not prepared as part

of the Alameda Watershed Management Plan; however, the goals of the two studies were coordinated and the recommendations set forth in the ACWRS were developed to consider the broad goals of the Alameda Watershed Management

Plan. Following are the objectives for the ACWRS:

- Identify the potential for establishing fisheries above Sunol Valley considering biological requirements, riparian vegetation conditions, recapture feasibility, and institutional responsibilities.
- Identify the potential for Sunol Valley groundwater management including recharge, storage, and extraction to increase overall SFPUC yield of water supply.
- Recommend reservoir operation policies to ensure adequate water quality conditions and maximize water supply.
- Development recommendations for the beneficial uses of Sunol Valley including water supply, gravel mining, nursery use, water treatment facilities, and public recreation.

A number of findings and conclusions were identified in the ACWRS, which is included in Appendix A-5. The three recommendations resulting from the study were:

1. SFPUC should formalize an agreement regarding objective flows, operating conditions, monitoring requirements, and respective obligations with the CDFG per their October 19, 1994 letter to SFPUC.
2. SFPUC should prepare a plan on the flow recapture facilities and their operation, including a geo-

technical investigation of foundation conditions at alternative sites for a rubber dam, sizing of project features, an initial environmental evaluation, operation requirements, and capital and annual cost estimates.

3. The SFPUC should develop an Integrated Resources Management Plan (IRMP) for Sunol Valley and its other resources in the East Bay area. Conceptually, an IRMP would help SFPUC maximize the revenue-generating potential in the Sunol Valley while simultaneously protecting the watershed and facilitating establishment of a trout fishery. The IRMP would assist SFPUC in administering the gravel quarry leases, in converting abandoned quarries to surface water storage reservoirs, and in administering the fisheries program.

Since the above recommendations were made, SFPUC has established a Memorandum of Understanding (MOU) with CDFG which obligates SFPUC to move forward with the recommendations for establishing a water release and recapture facility along Alameda Creek. This facility will allow for the release of water from Calaveras Reservoir into Calaveras and Alameda Creeks to balance enhancement of trout fisheries with maintenance of native non-game fisheries. These releases will also improve riparian vegetation. SFPUC would recapture these releases, to be used as part

of the water supply, at a surface impoundment just downstream from the Sunol WTP. A conceptual engineering report for the fish release and recapture facility was completed in June 1997. Detailed design and environmental review of the facility should commence within the coming year.

In addition, SFPUC undertook conceptual planning of the Sunol Valley as a part of the Watershed Management Plan. This study recommended a configuration and depth of mining to provide additional water storage for SFPUC, once mining was complete. It also provided recreation concepts in conjunction with development of these water storage reservoirs. The Sunol Valley Resources Management Element is described in Section 1.2.2 of this Plan. Policies and management actions from this Element are included in Chapters 4 and 5. The Element itself is included in Appendix A-3.

Finally, SFPUC is in the process of preparing an overall Water Supply Master Plan for the entire water system. This plan will look at the water supply and storage issues in the Sunol Valley and on the entire Alameda Watershed in greater detail.

### **2.19.2 Other Plans and Studies**

In addition to the projects described above, the SFPUC is also undertaking

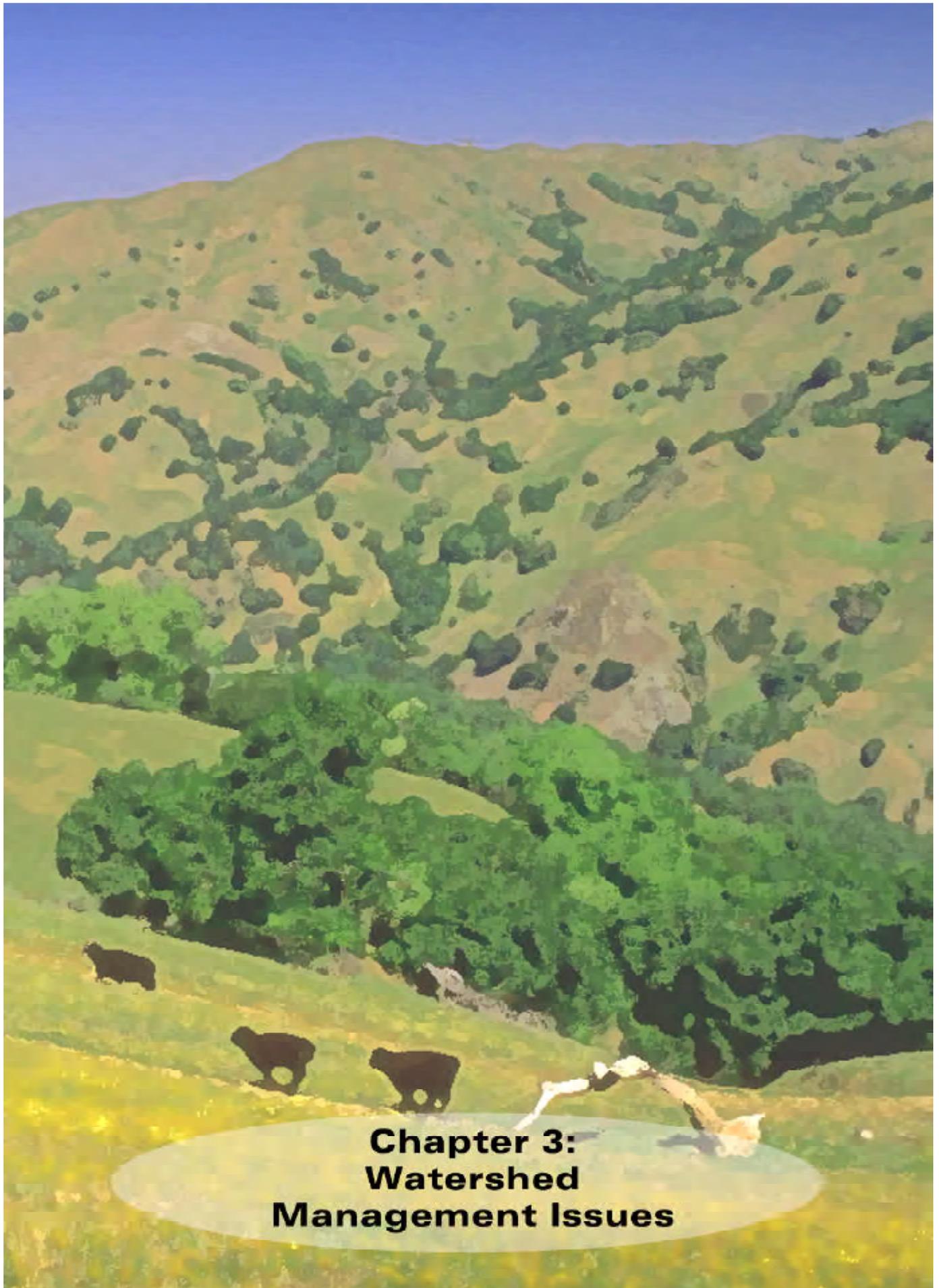
the following projects on the Alameda Watershed:

- Minor upgrades, ongoing improvements/repairs and additions/alterations to existing structures:
  - Watershed Facilities Demolition: removal of dilapidated, abandoned or duplicative structures
  - Adit Structures: replacement, repair and construction for new adit structures, which are vertical pipe and valve enclosures that allow access for maintenance staff.
  - Watershed Cottage Maintenance and Renovation
  - Watershed and Facility Fencing
  - Watershed Roads Maintenance and Repair
- Alameda Creek Diversion Tunnel outlet Protection - Restoration of the existing structure including concrete work to reinforce water release outfall structure.
- Sunol Water Temple and Grounds Restoration Plan - Three-phase plan that addresses the restoration of the Sunol Temple Building, entry road and areas immediately adjacent to the Temple and along Alameda Creek, and the area that generally extends from Temple Road to the edge of the proposed quarry pit and to Alameda Creek and Arroyo de la Laguna.
- Sunol Water Temple Landscape and Recreation Plan - Conceptual plan that provides information to assist the SFPUC in developing lease terms and conditions for a future

gravel quarry. The plan shows future recreational activities and landscape concepts for the area bounded by I-680 on the south, Paloma Way on the east and Alameda and Arroyo de la Laguna Creeks on the west and north respectively.

- Alameda Creek Diversion Dam Sluice Gates - Restoration of the existing structure including concrete work to reinforce water release out-fall structure.
- Bridge Across Turner Dam Spillway - Construction of shortcut for administrative vehicle traffic for safety/security.
- Rehabilitate Access in Calaveras Outlet Tower - Repair/upgrade of existing structure.
- Indian Creek Chlorine Monitoring - Installation of chlorine monitoring station on the existing Hetch Hetchy Aqueduct at the Coast Range Tunnel.
- Calaveras Pipeline Slope Stabilization - Erosion control and slope protection project.
- Sunol Water Temple Treatment Chloramine Conversion Plant Improvement Project - Expansion of existing plant and construction of new facilities.
- Hetch Hetchy Water Treatment Chloramine Conversion Project - Includes construction of numerous facilities at multiple locations along the Hetch Hetchy water system, including a major plant and contact station for chloramination of water.
- Sunol Fire Protection System (Town) - Installation of additional water tanks (non-potable water) for fire protection.
- Alameda Creek Discharge for Non-Compliant Water - Installation of discharge facility on the Alameda Creek siphon.
- Potassium Permanganate Feed Building at Calaveras - Demolish existing chlorine feed building and install new potassium permanganate feed building and system at Calaveras Reservoir.
- Alameda Creek Fisheries Enhancement Project - Construction of a recapture facility (including an inflatable rubber bladder dam, pump station, and pipeline extensions) to direct flows either to the Sunol Valley Water Treatment Plant or the San Antonio Reservoir for storage and later use. The project would also improve native fisheries and historic trout streams on Alameda and Calaveras Creeks downstream from Calaveras Reservoir.
- Aeration Facilities - Upgrade of existing facility at Calaveras Reservoir and installation of a new aeration facility, including compressor building, at San Antonio Reservoir. 

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**Chapter 3:  
Watershed  
Management Issues**

## Chapter 3. Watershed Management Issues

### 3.1 Introduction

The watershed management issues discussed in this chapter were identified during the planning process and collected from a number of sources, including: site surveys and analysis by the watershed planning team, interviews with SFPUC staff, three rounds of agency and public workshops, and a statistically valid consumer survey of randomly selected households in the SFPUC's service area. The identification and clarification of all pertinent issues is an integral part of the planning process and sets the stage for the development of goals, policies, and actions required for successful management of watershed resources.

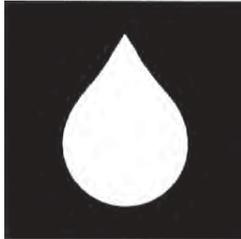
Watershed issues are highly complex and interrelated. For example, there is a potential for fertilizer-laden runoff to increase reservoir nitrogen and phosphorus levels. This in turn can increase algae growth. Large algae populations can lead to reduced oxygen concentrations as they decompose. Treatment difficulties often result from anoxic water. The SFPUC occasionally applies copper sulfate to the reservoirs to kill the algae blooms; however, copper sulfate can affect aquatic species. This issue, once solely an issue of water quality, now overlaps a number of issue areas.

Another example of how watershed issues overlap relates to water quality,

water supply, ecological resources, fire and safety, and fiscal impacts. The absence of fire from the watershed affects ecological resources by causing a modification of natural fire cycles and a build-up of fuels. This affects human safety by increasing the risk of fire within the watershed and on neighboring lands. Following a catastrophic fire, water runs off the burned slopes at an increased rate causing erosion, turbidity, and sedimentation in the reservoirs, affecting both water quality and water supply. Secondary impacts may also include reduced storage capacity and consequent flooding potential. Related fiscal impacts include liability and increased water treatment costs, as well as the costs of natural resource restoration measures required to mitigate impacts.

This chapter is organized into the following sections: water quality, water supply, natural and cultural resources, fire and safety, watershed activities, fiscal concerns, and public awareness. Within each of these sections, watershed management issues are identified and generally organized in order of highest to lowest priority. The goals, policies, management actions, and guidelines identified in Chapters 4 and 5 are based on the issues identified in this chapter. Chapter 6 outlines the phasing required for implementing the management actions.

*“Watershed issues are complex and interrelated.”*



*This symbol refers to Water Quality throughout the Plan*

## 3.2 Water Quality

 Protection of water quality is the primary mission and responsibility of the SFPUC. The primary concern of the public is also protection of the quality of their drinking water as indicated by comments received during the public workshops and reinforced by the results of the public survey. The 30,000 acres of primary watershed lands are of greatest concern in the protection of water quality as activities in the primary watershed directly affect SFPUC drinking water. The following section identifies the management issues related to water quality including: roads and vehicle usage; grazing; risks associated with microorganisms; erosion control; vegetation and pest management; risks associated with hazardous materials; water quality monitoring; risks associated with metals; earthquakes and other geological hazards; and interjurisdictional coordination and regulatory responsibilities.

### 3.2.1 Roads and Vehicle Usage

- Amount and intensity of runoff from paved roads, dirt roads, road cuts, road construction, and maintenance;
- The existing road system needs to be evaluated to determine if there are more roads than necessary to meet SFPUC maintenance and operation needs;
- Runoff of vehicle-related contaminants from roads, parking areas, and SFPUC facilities; and

- Construction and maintenance-related activities, fire management activities, and vehicular use/maintenance.

### 3.2.2 Grazing

- Rate and volume of runoff to reservoirs from compacted soils due to cattle; and
- Disturbance to streams and riparian corridors.

### 3.2.3 Risks Associated with Microorganisms

- Human and animal waste (e.g., cattle, horses, pets, feral pigs, deer, and other wildlife) increases the risk of microorganisms entering the reservoirs;
- Certain microorganisms such as *Cryptosporidium*, which are a major public health concern, are extremely difficult to remove from the water supply;
- Public access and trespassing can lead to body contact with reservoirs;
- Potential lack of use by the public of sanitation facilities;
- Potential spills/leakage from SFPUC facilities and chemical toilets used during construction and temporary field operations; and
- Potential leakage from residential sewage collection systems, septic systems, and sanitation facilities associated with upstream uses.

### 3.2.4 Erosion Control

- Increased turbidity and sedimentation in the reservoirs, resulting from erosion, degrades water quality and increases the risk of trihalomethane (THM) precursors;
- Lack of explicit guidelines for construction, maintenance, and operational activities;
- Vegetation removal through construction and maintenance activities and by wildlife;
- Rate and volume of runoff to reservoirs from compacted soils;
- Increased sediment loading due to deferred maintenance on sedimentation basins;
- Amount and intensity of recreational uses;
- Maintenance and irrigation activities at SFPUC facilities;
- SFPUC operational activities related to construction and maintenance, parking and vehicle usage, reservoir water level fluctuation, and Sunol WTP activities;
- Amount and intensity of runoff from impervious surfaces, dirt roads, road cuts, storm drainages, road construction and maintenance activities, and fire management activities;
- Amount and intensity of runoff from existing and new watershed and upstream activities. Issues include exposed soils, runoff due to inadequate site drainage, irrigation, and lawn/garden maintenance; and
- Risk of fire caused by vehicular use, recreational use, commercial uses (e.g., gas pipelines), and nearby residences.

### 3.2.5 Vegetation and Pest Management

- Runoff of pesticides and fertilizers from maintenance activities;
- Fertilizer-laden runoff increases the nitrogen and phosphorus content of the reservoirs and results in increased algae growth;
- Vegetation management along roadways, water pipeline corridors, and from fire management activities; and
- Rodent population control activities.

*“Protection of water quality is the primary mission and responsibility of the SFPUC”*

### 3.2.6 Risks Associated with Hazardous Materials

- Hazardous materials spills from vehicles, boats, and chemical toilets;
- Runoff from household use of hazardous materials;
- Spills related to chemical and fuel delivery and site runoff;
- Runoff of fire suppression chemicals used by SFPUC staff and other fire management groups;
- Runoff of asbestos fibers, found in serpentine formation along the north slope of Alameda Creek, in the case of disturbance;
- Failure, explosion, or damage of natural gas and petroleum pipelines during an earthquake or excavation activities; and
- Improper disposal of household chemicals. The U.S. Environmental Protection Agency (EPA) has identified 23 priority pollutants that are likely to be disposed of down household drains. Disposal of these chemicals may impair septic system

function and may contaminate ground or surface water.

### **3.2.7 Water Quality Monitoring**

- Need for additional monitoring of existing activities to determine their impact on water quality;
- Need for additional monitoring downstream of known contaminant sources; and
- Need for additional monitoring where streams enter the watershed to determine upstream impacts on watershed water quality.

### **3.2.8 Risks Associated with Metals**

- Runoff of metals from abandoned junk and debris; and
- Runoff of lead and other metals associated with vehicle use.

### **3.2.9 Earthquakes and Other Geological Hazards**

- Failure of facilities, infrastructure, and utilities;
- Slope failure and landslides; and
- Exposed soils and potential leaks associated with the quarry operations.

### **3.2.10 Interjurisdictional Coordination and Regulatory Responsibilities**

- Need for coordinated actions between the SFPUC and other upstream, downstream, and adjacent agencies, jurisdictions, and private parties to address water quality issues;
- Increasingly strict water quality regulations to protect drinking water quality;
- Reduced flexibility and available alternatives to meet newer and stricter regulatory standards; alternatives are limited to more capital and operation costs and stricter control of the watershed; and
- General plans allow for additional residential development in the upper watershed.

### 3.3 Water Supply



Closely related to protection of water quality is ensuring a reliable water supply. The SFPUC constantly strives to find new ways to increase the water supply and to make the present supply more reliable. Management issues related to water supply are erosion control and storage capacity, and water reclamation.

#### 3.3.1 Erosion Control and Storage Capacity

- Erosion causes sedimentation, which decreases the storage capacity of reservoirs and tributaries and increases the potential for flooding;
- Reservoir storage capacity has been reduced substantially since reservoir creation due to sedimentation;
- Need for additional water storage;

- Need for additional potable water supply to provide emergency storage;
- Increasing demand for water;
- Increasingly longer periods of drought; and
- See concerns listed under Section 3.2 Water Quality: Erosion Control.

#### 3.3.2 Water Reclamation

- Use of potable water where non-potable, reclaimed water could be substituted; and
- Increased use of raw water by cattle, watershed users (e.g., golf course, agricultural activities, nurseries, irrigation of residential areas, gravel operations), and SFPUC facilities reduces available water for system wide use.



*This symbol refers to Water Supply throughout the Plan*

### 3.4 Ecological and Cultural Resources



The plants, wildlife, and fishery resources on the watershed are all part of a healthy and balanced ecosystem. Protection of the watershed resources and maintaining a balanced ecosystem helps the SFPUC meet its primary goal of providing high quality water to its customers. Cultural resources on the watershed include SFPUC structures and facilities over 50 years old, as well as Native American resources. Protection of these resources is a component of responsible land management. Man-

agement issues related to natural and cultural resources on the watersheds include: impact of watershed activities, operations/maintenance and regulatory compliance, training, protection of habitat integrity, emergency planning, and data research and monitoring.

#### 3.4.1 Impact of Watershed Activities

- Existing fuel, pest, and vegetation management activities are not coordinated;



*This symbol refers to Ecological and Cultural Resources throughout the Plan*

*“The public is concerned with protecting the ecological and cultural resources of the watershed”*

- Impacts of grazing on soil, wildlife habitat, native vegetation, and riparian corridors;
- Impacts of golf course on habitats;
- Impacts of trail use and maintenance on wildlife and special status species;
- Existing fuelbreak and firebreak construction and maintenance do not adequately address wildlife habitat and use;
- Vegetation management (e.g., roadside clearing, noxious weeds) activities do not address special status species habitat;
- Pest eradication programs do not address impacts on other species;
- Compatibility of Sunol Valley quarries and cultural resources;
- Hydrological functions need to be balanced with habitat needs;
- Disruption of natural drainage systems and degradation of aquatic habitat;
- Altered stream channel morphology;
- Altered aquatic and floodplain habitats;
- Impacts of reservoir fluctuation on shoreline habitat;
- Operations and maintenance impacts on aquatic species;
- Improved management of sedimentation basins and stock ponds is required to adequately address aquatic resources and wetlands/riparian habitat;
- Impact of downstream releases on fisheries, riparian habitat, and streambank erosion; and
- Build-up of copper used during some SFPUC activities may adversely affect aquatic species.

### **3.4.2 Operations/ Maintenance and Regulatory Compliance**

- Actions to satisfy operational and long-term infrastructure maintenance needs may cause inadvertent damage to ecological and cultural resources, and may conflict with environmental regulatory compliance requirements.

### **3.4.3 Training**

- SFPUC operations work forces are not all trained in watershed resources (e.g., resource identification, regulatory compliance), which has resulted in inadvertent damage to natural and cultural resources;
- Need for training related to operational guidelines that can be readily applied by contractors and field staff; and
- Need for additional funding for training related to permitting management, personnel training, and continuing education.

### **3.4.4 Protection of Habitat Integrity**

- Impacts to native vegetation, riparian corridors, and oak regeneration from cattle;
- Fragmentation and disruption of terrestrial habitat;
- Lack of adequate protection of sensitive habitat areas;
- Introduction of aggressive, exotic species that displace native species and decrease biodiversity;

- Disturbance to and loss of habitat from new development and land uses;
- Impact on wildlife movement from roads, trails, fences, and additional watershed activities;
- Increasing feral pig population and related damage to watershed resources;
- Increasing ground squirrel population; and
- Disruption of native wildlife by domesticated wildlife, as areas adjacent to the watershed become urbanized.

#### **3.4.5 Emergency Planning**

- Need for additional emergency planning and pre-incident preparation for the protection of natural resources

during emergency response can result in short and long-term impacts on ecological and cultural resources; and

- Need for guidelines for response to fires and spills in areas with sensitive resources.

#### **3.4.6 Data Research and Monitoring**

- Need for additional baseline resource data and ongoing program monitoring hampers effective resource decisionmaking; and
- Effectiveness of various resource management actions on affected resources needs to be monitored to determine their successes and failures.

### 3.5 Fire and Safety



*This symbol refers to Fire and Safety throughout the Plan*



A catastrophic fire can have a tremendous impact on natural resources, the visual environment, and potentially on adjacent urban areas and can also have a significant deleterious effect on water quality and the water supply system. The SFPUC strives to protect the watershed from fire and manage the watershed fuels to prevent a catastrophic fire and avoid these far reaching impacts. Management issues relate to fire management, emergency response, and liability.

#### 3.5.1 Fire Management

- Need for a comprehensive fire management plan;
- Fire suppression activities which result in alteration of natural fire cycles;
- Increased risk and potential magnitude of fire hazard due to excessive fuel load (i.e., vegetation overgrowth);
- Lack of sufficient fire hazard reduction activities;
- Need for additional fire response staff and equipment;
- Shortage of fire response staff during the fire season;
- Because grazing reduces fire hazard, fuel management issues will arise if grazing is limited or eliminated;
- Limited ability to respond to a major fire due to inadequate infrastructure (e.g., heliports) and incomplete system of water collection and storage facilities throughout the watershed;
- Public access to high fuel areas and during high fire season increases the risk of fire;
- Inadequate vehicle maintenance increases risk of fire;
- Urban encroachment adjacent to and upstream of the watershed increases the risk of fire damage to adjacent properties;
- Incidence of fire starts from upstream and adjacent neighboring areas; and
- Incidence of fire from roadways, fuel pipelines, and electric transmission lines that pass through the watershed.

#### 3.5.2 Emergency Response

- An integrated emergency response plan and appropriate training for response to all watershed emergencies is needed;
- Need for improved communications equipment;
- Inadequate coordinated emergency response with other agencies; and
- Inadequate internal coordination between watershed-wide and facility-specific emergency response.

#### 3.5.3 Liability

- New or expanded watershed activities may increase personal-injury risks and thus increase SFPUC's liability;
- Liability associated with public access; and
- Liability associated with fire hazard.

### 3.6 Watershed Activities



The SFPUC and the public are generally in agreement on the key issues in the areas of water quality, water supply, natural and cultural resources, fire and safety, public awareness and fiscal concerns. However, in the area of watershed activities (which includes watershed maintenance and lease management as well as public access), the SFPUC and the public have differing goals. The SFPUC's major responsibility is to protect water quality and the watershed resources with emphasis on the primary watershed areas where watershed activities have the greatest potential to impact SFPUC water quality. It manages its own activities and the activities of lessees to meet these responsibilities. However, without some control over public access and activities, it is difficult to ensure high water quality and protection of natural resources.

Certain members of the public understand this need for control while others do not. This results in the public being divided on the appropriate levels of public access. Various members of the public have supported all of the following levels of access—exclusion of public access, controlled public access, balancing public access, maintaining the current access level, low impact public access, balancing public access with watershed protection, increased public access, and unlimited public access. Specific access issues on which the public is divided in-

clude golf courses, hiking, equestrian access, fishing, boating, hunting, shooting ranges, and mountain bike use. The public is also divided on the value of educational and scientific access—some feel it should be increased and others feel it should be limited to avoid damage to the watershed.

The management issues related to watershed activities are: determining activity compatibility and impacts; lease management; public access; SFPUC operations, management, and maintenance; visual impacts; interjurisdictional coordination; and public education.

#### 3.6.1 Determining Activity Compatibility and Impacts

- Expansion of Sunol Valley quarries and their compatibility with adjacent land uses;
- Need for policies and management actions to determine which activities are compatible and incompatible with watershed protection and management;
- Need for a process to assess proposals, projects, and work orders by requiring the completion of an environmental impact checklist, which will assess the impacts of watershed activities on watershed resources; and
- The impacts of existing recreational activities on the watershed are not



*This symbol refers to Watershed Activities throughout the Plan*

*“The public is concerned with public access issues and are divided on the appropriate level of public access to the watershed”*

monitored to determine whether watershed resources or the recreational experience (e.g., overcrowding) are being adversely affected. A threshold for significant impacts is needed.

**3.6.2 Lease Management**

- Management of existing leases is not coordinated with protection of watershed resources;
- Impacts of existing lease activities on water quality, water supply, and ecological and cultural resources need further study; and
- Existing lease activities have been in place for many years without evaluation of their appropriateness as watershed activities.

**3.6.3 Public Access**

- Need for updated and clear public access policies and guidelines;
- Need for a clear and efficient permitting system to cover activities requiring a permit; and
- If the watershed is opened to extensive public access, it will be difficult to close and restore the watershed if the activities are found to be detrimental.

**3.6.4 SFPUC Operations, Management, and Maintenance Activities**

- Need for ongoing annual maintenance activities to occur on a timely basis;

- Policies and practices are not currently in place for some SFPUC management and maintenance activities, resulting in damage to watershed resources; and
- Some watershed roadways do not meet standards for levels of use.

**3.6.5 Visual Impacts**

- The visual impacts of existing watershed activities have not been evaluated; and
- Lack of guidelines to determine the visual impacts of existing and proposed watershed activities.

**3.6.6 Interjurisdictional Coordination**

- Urban encroachment; and
- General plan designations of Alameda County and Santa Clara County lands upstream of primary reservoirs are not compatible with watershed protection.

**3.6.7 Public Education**

- Lack of facilities, resources, and methods to educate and interpret watershed values.

### 3.7 Fiscal



The cost of providing high quality water to SFPUC customers is borne primarily by the rate payer, with additional funding from leases and permits. These rates cover the costs of maintaining a high quality delivery and treatment system. It is appropriate for the SFPUC to pay for watershed activities which protect the quality and quantity of water and the natural resources. Fiscal management issues include: costs and benefits of lease and permit activities; SFPUC coordination; funding for watershed management activities; staffing and training; watershed land acquisition; and inter-jurisdictional coordination.

#### 3.7.1 Costs and Benefits of Lease and Permit Activities

- Costs and benefits of existing lease/permit activities are difficult to determine accurately. Revenue generation is accurately tracked by the SFPUC, but costs of the lease/permit activities (e.g., lease administration, staffing, physical improvements required on the land, water consumption, impacts to water quality, additional treatment costs required, impacts to ecological resources, etc.) are not balanced against the revenue;
- Costs of managing the lease may exceed revenues generated in some cases;

- Costs and benefits of public access activities and related management/monitoring activities (e.g., fire management activities, water quality/ecological monitoring) have not been evaluated;
- Costs related to risk (e.g., water quality, fire, etc.) are difficult to quantify;
- Some lessees are paying a discounted rate for water and are not required to implement water conservation practices;
- Revenue generation and responsible resource management may not be compatible;
- Permit fees do not always cover the costs of permit administration;
- Additional treatment costs related to watershed activities; and
- Any activity on the watershed that directly (e.g., chemical spill) or indirectly (e.g., causes erosion) reduces the water supply should be considered a cost.

#### 3.7.2 SFPUC Coordination

- Water system maintenance and improvement activities (e.g., pipeline repair, fence maintenance, road construction and maintenance) are often not coordinated with the LRMS, which leads to inadvertent damage to watershed resources and associated costs.



*This symbol refers to Fiscal Resources throughout the Plan*

### **3.7.3 Funding for Watershed Management Activities**

- Funding for watershed management activities is limited;
- Funding for the staff, training, and equipment required to implement the Watershed Management Plan must be recognized by the SFPUC as a necessity that must be committed to;
- Need to investigate additional watershed management funding sources (e.g., watershed trust fund, user fees, lotteries) as well as cost-saving methods for implementation (e.g., use of volunteer forces);
- SFPUC may have surplus land not essential to maintain high water quality, which could be sold and the revenue used to purchase lands which are critical; and
- Revenues generated by watershed activities are not used to fund watershed management and maintenance activities and land acquisition.

### **3.7.4 Staffing and Training**

- Need for training of existing SFPUC staff to undertake watershed management activities; and

- Need for additional staff to implement the Watershed Management Plan.

### **3.7.5 Watershed Land Acquisition**

- SFPUC does not own/manage certain critical watershed lands where activities may have an impact on water quality; and
- Inholdings and adjacent lands represent threats to water quality where more intensive development may be allowed.

### **3.7.6 Interjurisdictional Coordination**

- Coordination with adjacent jurisdictions is needed to establish development restrictions and/or buffer zones to protect critical watershed lands upstream of reservoirs.

## 3.8 Public Awareness and Agency Participation



Public awareness involves ongoing education and outreach to the general public, to upstream landowners, and to other agencies or organizations. The level and type of outreach must be different for each group; however, providing an understanding of water quality and the importance of watershed protection in maintaining water quality is the primary focus of public outreach. This section addresses public awareness needs and management concerns relating to the general public, upstream landowners, and agency participation.

### 3.8.1 General Public

- Public education is needed to clarify the purpose and vulnerability of the watershed, and their implications in terms of public access. This education should distinguish between public park lands devoted to public recreation purposes and watershed land that is critical for water supplies and water quality;
- Educational efforts in the use and value of the watershed are needed to increase public support for SFPUC watershed protection efforts (e.g., protection of water quality, water supply, or watershed resources);
- Lack of facilities and revenues to educate and interpret watershed values concerning water and natural resources; and

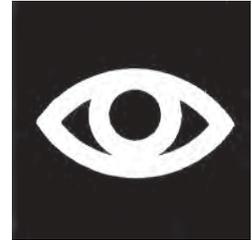
- Coordination with nonprofit organizations which have educational and resource protection goals similar to the SFPUC may be beneficial to provide educational programs.

### 3.8.2 Upstream Landowners

- Lack of awareness by landowners upstream of SFPUC watershed lands about activities that impact water quality, water quality protection, and improvement practices and procedures.

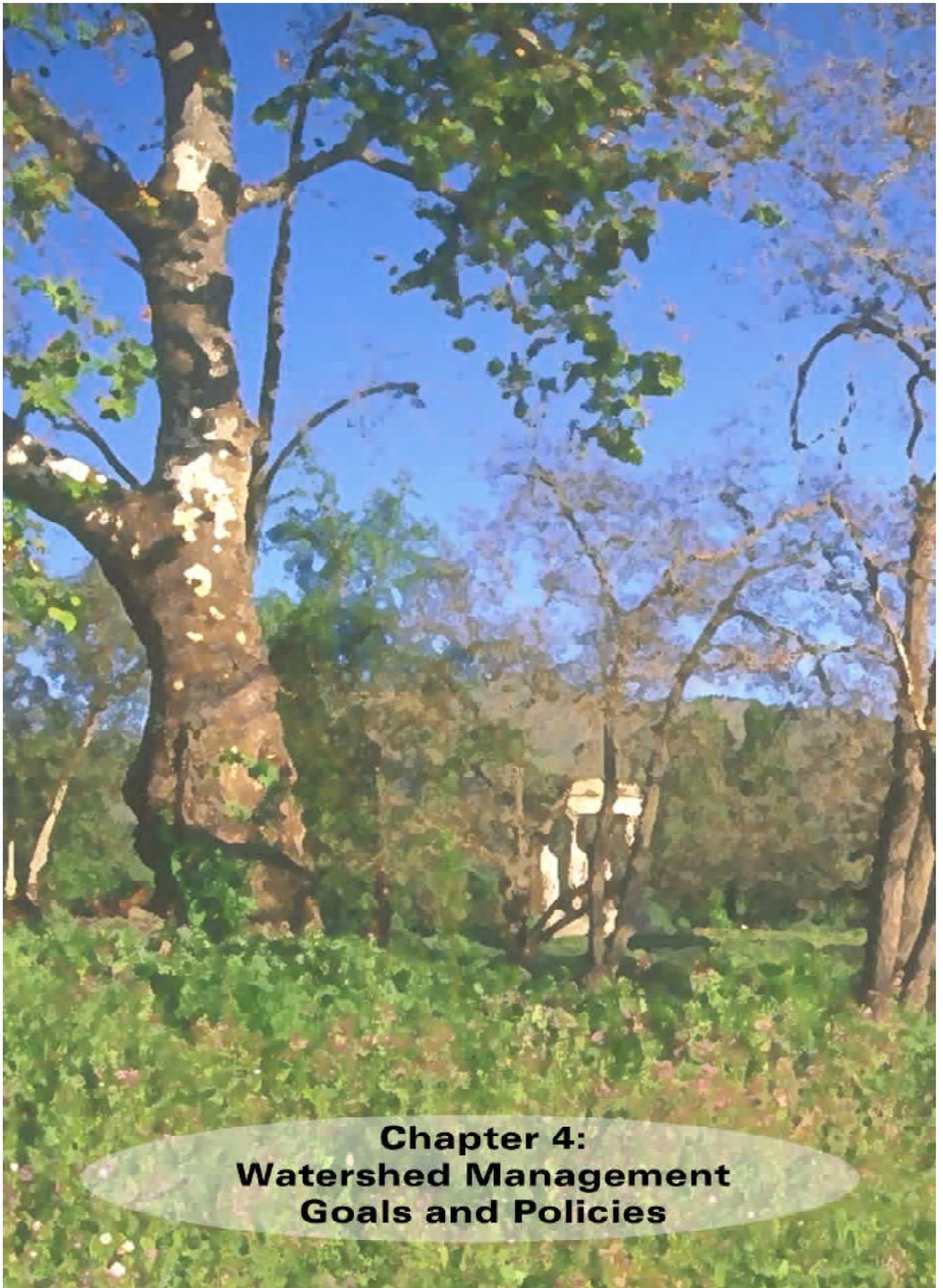
### 3.8.3 Agency Participation

- Need for increased emphasis on conservation, reclamation, and reuse of water by various agencies; and
- Need for coordinated, interjurisdictional land management activities with the following agencies:
  - Southern Alameda Creek Watershed Project - participating in a Coordinated Resource Management Plan with upstream owners;
  - Alameda County - quarry management;
  - EBRPD (recreation management, grazing, vegetation management, etc.);
  - ACWD - coordinated approach to range management;
  - Various agencies - mutual aid agreements regarding fire response and prescribed burning;



*This symbol refers to Public Awareness throughout the Plan*

- California Department of Forestry and Fire Protection and local fire marshals - fire management and fire response;
- CDFG - downstream fisheries management, wildlife management, and Stream Alteration Agreements;
- California Department of Pesticide Regulation - pesticide use;
- Regional Water Quality Control Board - water quality monitoring requirements;
- USFWS - Canada goose and Aleutian Canada goose and other waterfowl; and
- National Marine Fisheries Service (NMFS) - steelhead and salmon management. 



**Chapter 4:  
Watershed Management  
Goals and Policies**

# Chapter 4. Watershed Management Goals and Policies

## 4.1 Introduction

This chapter identifies the goals and policies for managing the watershed. The goals were established during the course of the planning process and address the principal watershed planning issues and concerns identified in Chapter 3. The policies have been developed from the goals and serve as the framework to guide ongoing decision-making by the SFPUC and other responsible parties.

The watershed management goals include the primary goal, which is focused on maintaining and improving water quality, and six supporting secondary goals. In management of the primary watershed (i.e., those lands upstream of San Antonio and Calaveras Reservoirs, and the Fish Release and Recapture Facility), the primary goal must be met first, even if an intended action is focused on a secondary goal. Each goal is represented by an icon. These icons are used throughout this document to indicate that a given policy or management action is derived from and addresses the goal each icon represents.

The policies have been organized into eleven major topic areas:

 Water Quality (WQ)

-  Water Supply (WS)
-  Vegetation (V)
-  Wildlife (W)
-  Aquatic Resources (AR)
-  Cultural Resources (CR)
-  Fire (F)
-  Safety and Security (S)
-  Watershed Activities (WA)
-  Public Awareness (PA)
-  Administration and Finance (AF)

Each topic area is referenced by the first letter(s) of each word for easy recognition. Within each topic area, associated policies are numbered. 

### Watershed Management Goals

**Primary Goal**

-  Maintain and improve source water quality to protect public health and safety.

**Secondary Goals**

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

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## 4.2 Water Quality (WQ)



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

Maintaining and improving the quality of source drinking water is the primary watershed management goal. The deterioration of water quality can be caused by the effects of poor watershed policies and decision-making associated with the management of natural resources, watershed activities, and other land uses. Problems associated with water quality are generally physical (e.g., particulates and solids), chemical (e.g., synthetic organic compounds [SOCs], THMs, and nutrients), or biological (e.g., microorganisms) in nature. Watershed management policies aim to minimize or reduce water quality problems through the control of erosion, sedimentation, storm-water runoff, the introduction of undesired constituents into the water supply (e.g., pathogens, excess nutrients, disinfection byproduct precursors [DBPs], pesticides, and other hazardous materials), and land ownership and activities.

Water quality policies have been organized into the following topic areas

- Physical, Chemical, and Biological Considerations
- Roads, Trails, and Rights-of-Way
- Erosion, Sedimentation, and Run-off

- Coordination, Collaboration, and Land Management
- Wetlands, Riparian Areas, and Stream Channels
- Access Restrictions and Enforcement
- Monitoring

#### **Physical, Chemical, and Biological Considerations**

**Policy WQ1** Prevent the introduction of pesticides and chemicals into the water supply by minimizing and controlling the use of these constituents; implementing alternative methods for pest control, where feasible; and by controlling chemical use and requiring that non-toxic, non-persistent alternatives are used where practical.

**Policy WQ1.1** Avoid disturbance to and location of activities on lands within the High Water Quality Vulnerability Zone to reduce the possibility of negative water quality impacts. At a minimum maintain a 300-foot disturbance-free buffer around all waterbodies and streams.

**Policy WQ2** Restrict aerial broadcast spraying of chemical pesticides as a means of vegetation management and pest control. Ultra-low volume (ULV) aerial spraying of biorational controls



*Primary Goal:  
“... Improve Water Quality to Protect Public Health and Safety”*

such as *Bacillus thuringiensis israelensis* (a bacterium) and *Lagenidium giganteum* (fungal parasite), which are host-specific agents (affecting mosquito larvae), may be allowed if consistent with the CCSF City Pesticide Management Plan (No. 274-97) and the SFPUC Draft Integrated Pest Management Plan (IPMP) since they do not have the side effects of persistence, accumulation, and non-selective mortality associated with chemical pesticides.

**Policy WQ3** Minimize nutrient loading to the water supply.

**Policy WQ4** Minimize the introduction of disinfection by-product precursors (DBPs) to the water supply.

**Policy WQ5** Minimize the risk of metals leaching to waterbodies and prohibit dumping of metals within the watershed.

**Policy WQ6** Prevent the introduction of asbestos fibers into the water supply.

**Policy WQ7** Prevent the potential for hazardous materials spills into the water supply by controlling their use and transport within the watershed.

**Policy WQ8** Minimize the introduction of pathogens to the water supply.

**Policy WQ9** Once the Sunol Valley quarries have been reclaimed as reservoirs, maintain water quality in the reservoirs so that the water remains treatable by

the Sunol WTP. Runoff from the surrounding areas shall be diverted away from the reservoirs to protect them from water potentially containing sediments, pathogens, synthetic organic compounds, and total organic carbon.

### **Roads, Trails, and Rights-of-Way**

**Policy WQ10** Minimize, and where possible prohibit, the construction of new roads and trails.

**Policy WQ11** Where new roads or trails are required, locate and design them to follow natural topography, minimize steep slopes and stream crossings, avoid large cut and fill road designs, minimize excavation, and avoid highly erodible areas.

**Policy WQ12** Minimize and where possible restrict the construction of new roads or access easements through primary watershed lands to serve new development not in SFPUC ownership to areas of low vulnerability.

**Policy WQ13** Minimize and where possible restrict new easements and rights-of-way through primary watershed lands to areas of low vulnerability. Allow only existing uses, those within existing alignments, or those that do not pose a threat to water quality.

**Policy WQ14** Optimize the existing road system such that there are no more roads than necessary for operations and maintenance purposes.

**Policy WQ14.1** Limit traffic speeds on unpaved roads to 15 miles per hour except during emergencies.

### **Erosion, Sedimentation, and Runoff**

**Policy WQ15** In the primary watershed, minimize, and where possible prohibit, land uses and activities that have the potential to cause erosion, sediment generation, and stormwater runoff.

**Policy WQ16** Where suitable, use sedimentation basins to control the effects of erosion and sediment transport.

**Policy WQ17** Minimize and where possible prohibit the creation of impervious surfaces in primary watershed lands. Restrict the creation in secondary watershed lands to areas of low vulnerability.

**Policy WQ18** Minimize vehicle-related contaminants in runoff from road, parking lots, maintenance facilities, and other sources.

### **Coordination, Collaboration, and Land Management**

**Policy WQ19** Minimize and where possible prohibit the construction of new on-site waste treatment systems to serve facilities or other new developments on primary watershed lands. Restrict construction within secondary watershed lands to areas of low vulnerability.

**Policy WQ20** Coordinate water quality concerns with fire management activities to prevent erosion.

**Policy WQ21** Foster interagency agreements with adjacent jurisdictions to limit new construction on non-SFPUC lands within the hydrologic watershed to minimize adverse effects to water quality.

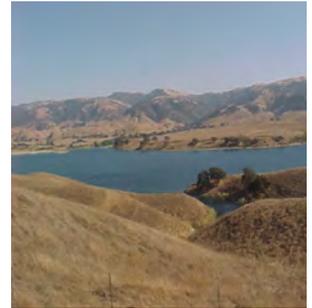
**Policy WQ22** Actively seek acquisition of or purchase of conservation easements over lands within the hydrologic watershed that are critical to water quality and supply that are not in SFPUC ownership. Encourage the use of applicable Plan policies and management actions to manage lands under a conservation easement.

**Policy WQ23** Prohibit the sale or exchange of SFPUC lands within the primary watershed that are critical to water quality, supply, and SFPUC operations.

**Policy WQ24** Actively participate in local and regional government planning processes to keep abreast of new projects which may affect SFPUC lands and water quality.

### **Wetlands, Riparian Areas, and Stream Channels**

**Policy WQ25** Wherever possible, preserve and protect stream channels and banks in the primary watershed to protect water quality by maintaining or improving channel stability and reducing bank erosion.



*San Antonio Reservoir*

**Policy WQ26** Prohibit unauthorized fill or excavation activities on wetlands, riparian zones, etc. Achieve regulatory compliance for maintenance activities within wetland and riparian areas.

### **Access Restrictions and Enforcement**

**Policy WQ27** Prohibit swimming, boating, and windsurfing and other body contact activities in all water sources.

**Policy WQ28** Strictly control public access to minimize adverse effects to water quality.

**Policy WQ29** Actively enforce penalties and other standard enforcement procedures on activities that adversely affect water quality.

### **Monitoring**

**Policy WQ30** Require intensive management and ongoing monitoring of land uses and activities that could result in the introduction of pathogens into the water supply.

**Policy WQ31** Require ongoing water quality monitoring of reservoirs and tributaries to detect decreases in water quality related to watershed activities. 

### 4.3 Water Supply (WS)



#### *Secondary Goal: Maximize Water Supply*

To achieve this goal, policies have been developed that focus on a number of objectives, including: maximizing reservoir and groundwater storage, preventing interruptions to water supply, minimizing water use within the watershed through conservation and reclamation, and enhancing the water yield of the watershed.

Water supply polices have been organized into the following topic areas:

- Water Storage
- Conservation and Reclamation
- Water Quality and Yield
- Water Releases

#### **Water Storage**

**Policy WS1** Maximize reservoir storage capacities by minimizing sedimentation in reservoirs.

**Policy WS2** Evaluate the potential for reclamation of the Sunol Valley quarry pits as reservoirs for water supply purposes.

#### **Conservation and Reclamation**

**Policy WS3** Require conservation practices, where appropriate, to minimize water use within the watershed.

**Policy WS4** Require the use of reclaimed water, where appropriate, to minimize water use within the watershed.

#### **Water Quality and Yield**

**Policy WS5** Prevent a reduction in the water supply by reducing risks to water quality.

**Policy WS6** To ensure adequate water quality protection, require that all reclaimed water used on the watershed meet Department of Health Services (DHS)/Regional Water Quality Control Board (RWQCB) requirements.

**Policy WS7** Enhance the water yield of the watershed, where compatible with other natural resource management policies, while prohibiting activities that could adversely affect water quality.

#### **Water Releases**

**Policy WS8** Minimize the release of water that cannot be recaptured. 



*Secondary Goal:  
"Maximize Water Supply"*

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## 4.4 Vegetation (V)



### *Secondary Goal: Preserve and Enhance the Ecological and Cultural Resources of the Watershed*

Several policies addressing vegetation management have been developed to accomplish this goal. These policies aim to protect, preserve, enhance, and restore significant plant environments, foster botanical investigations for the benefit of SFPUC, control the use of chemicals, and identify potential adverse impacts to vegetation caused by proposed projects.

Vegetation policies have been organized into the following topic areas:

- Pest Management and Chemical Use
- Control of Invasive Species and Noxious Weeds
- Special Status Plant Communities
- Specialized Habitat Considerations
- Impact Assessment for Future Projects

#### **Pest Management and Chemical Use**

**Policy V1** Manage an Integrated Pest Management (IPM) program, under the responsibility of an SFPUC-licensed Pest Control Advisor (PCA), in accordance with the City and County of San Francisco’s City Pesticide Management Plan Ordinance (No. 274-97) and the SFPUC IPMP to restrict, and where possible eliminate, the use of chemical ap-

plications (including pesticides or other poisons) that adversely affect water quality, accumulate in the food chain, and/or have adverse effects on ecological function and reproductive success of wildlife and fish. Require that the most appropriate method of pest control be used to achieve desired objectives from a range of treatment alternatives.

**Policy V2** Focus chemical use reduction efforts in areas where they are currently being used most intensively.

#### **Control of Invasive Species and Noxious Weeds**

**Policy V3** Prohibit the planting of exotic plant species.

**Policy V4** Reduce the occurrence of noxious weeds and invasive exotic plant species through eradication and control practices.

#### **Special Status Plant Communities**

**Policy V5** Protect, preserve, and enhance significant botanical resources, including populations of rare, threatened, endangered, and sensitive plant species and their habitat.



*Secondary Goal:  
“Enhance the Ecological Resources of the Watershed”*



*Oak Woodlands*

**Policy V6** Encourage and allow investigations of special status plants and communities on the watershed to further the SFPUC’s understanding of the watershed’s vegetation and its condition.

**Specialized Habitat Considerations**

**Policy V7** Preserve the biodiversity and genetic integrity of the watershed plant communities, where possible.

**Policy V8** Protect, conserve, and enhance wetlands and riparian communities.

**Policy V9** Protect and restore unique, local, and/or indigenous plant species to maintain biodiversity and specialized habitat values.

**Policy V10** Manage grasslands and rangelands to balance, wherever possible, wildlife habitat values, the restoration of native perennial species, and the reduction of fuel loads and noxious weeds.

**Policy V11** Manage shrub communities to reduce fuel loads, prevent soil erosion

and sedimentation, improve wildlife habitat access and use, and control invasive plants.

**Policy V12** Manage woodlands and forests to maintain healthy, vigorous, and diverse stands with a multiplicity of age and size classes.

**Policy V13** Use controlled fire to enhance natural vegetation regimes, and enhance wildlife habitat.

**Policy V14** Give priority to restoring degraded habitat rather than creating new habitat, with the exception of sites for wetland mitigation banking where new wetland habitat should be created.

**Impact Assessment for Future Projects**

**Policy V15** Require a site-specific analysis prior to proposed facility and infrastructure projects, operations and maintenance activities, and proposed construction projects to determine the presence of sensitive vegetation resources and the potential effects of the activity on the resource. Analyses shall be conducted in accordance with all applicable State and Federal laws, statutes, and guidelines. 

## 4.5 Wildlife (W)



### *Secondary Goal: Preserve and Enhance the Ecological and Cultural Resources of the Watershed.*

Wildlife policies have been developed as part of this Plan to protect and enhance the wildlife resources of the watershed. These policies focus on protecting, conserving, enhancing and restoring significant wildlife resources; eradicating pest species; controlling public access; identifying potential adverse impacts to wildlife caused by future projects; and fostering wildlife investigations and monitoring activities for the benefit of the SFPUC.

Wildlife policies have been organized into the following topic areas:

- Protection and Enhancement of Wildlife Resources and Habitat
- Pest Management and Control
- Access, Restriction, and Management
- Impact Assessment for Future Projects
- Compliance and Coordination
- Studies and Monitoring

#### **Protection and Enhancement of Wildlife Resources and Habitat**

**Policy W1** Protect high Ecological Sensitivity Zones (ESZs), including host plant communities supporting populations of State and Federally listed animals, using sound scientific methods.

**Policy W2** Protect, conserve, and enhance existing native wildlife populations and their habitat.

**Policy W3** Preserve the biodiversity and genetic integrity of local wildlife populations, where possible.

**Policy W4** Protect, conserve, and enhance ecosystems that provide important wildlife habitat values.

**Policy W5** Protect, preserve, and monitor important habitat features such as mature trees with cavities, downed trees, snags, rock outcrops, cliff ledges, and caves for wildlife use, where they do not conflict with health and safety issues.

**Policy W6** Maintain the integrity of the watershed creeks to retain their value as riparian ecosystems and wildlife corridors.

#### **Pest Management and Control**

**Policy W7** Control, and where possible eradicate, pest species, including harmful, feral, or introduced animals.



*Tule Elk Herd*

### **Access, Restriction, and Management**

**Policy W8** Restrict public and control staff access to high ESZs to minimize human disturbance to sensitive wildlife and their habitat.

### **Impact Assessment for Future Projects**

**Policy W9** Require a site-specific analysis prior to proposed facility and infrastructure projects, operations and maintenance activities, and proposed construction projects to determine the presence of sensitive wildlife resources and the potential effects of the activity on the resource. Analyses shall be conducted in accordance with all applicable State and Federal laws, statutes, and guidelines.

**Policy W10** Protect the integrity of wildlife movement corridors by properly siting infrastructure, facilities, and public access features to maintain landscape connectivity, and minimize fragmenta-

tion and degradation of wildlife habitat.

### **Compliance and Coordination**

**Policy W11** Achieve appropriate compliance, when watershed activities and operations affect regulated and legally protected species, by implementing comprehensive wildlife protection programs (such as habitat conservation plans), obtaining appropriate permits, and establishing conservation easements.

### **Studies and Monitoring**

**Policy W12** Encourage and allow investigations of wildlife, including the distribution and occurrence of special status species and their habitats, on the watershed to further the SFPUC's understanding of the watershed's wildlife resources and their condition.

**Policy W13** Monitor the short- and long-term effects of wildlife management programs for relative effectiveness and benefit to ecological integrity. 

## 4.6 Aquatic Resources (AR)



### *Secondary Goal: Preserve and Enhance the Ecological and Cultural Resources of the Watershed.*

Aquatic resource policies have been developed as part of this Plan to preserve and enhance the aquatic resources of the watershed. These policies aim to protect, preserve, enhance, and restore significant aquatic resources; identify potential adverse impacts to aquatic resources caused by future projects; and manage the aquatic resources in cooperation with other agencies and groups.

Aquatic resource policies have been organized into the following topic areas:

- Protection and Enhancement of Aquatic Resources and Habitat
- Water Quality
- Fisheries
- Impact Assessment for Future Projects
- Management and Coordination
- Mitigation Banking

#### **Protection and Enhancement of Aquatic Resources and Habitat**

**Policy AR1** Conserve, protect, and enhance the biodiversity, genetic integrity, and habitat of the watershed’s aquatic resources.

**Policy AR2** Protect special status species and adhere to applicable State and Federal management regulations.

**Policy AR3** Control populations of predaceous exotic aquatic species that threaten special status species.

**Policy AR4** Promote healthy, diverse riparian and wetland vegetation to provide shade and cover necessary for fish spawning, rearing, and feeding areas.

#### **Water Quality**

**Policy AR5** Minimize and where possible eliminate the introduction of chemicals (e.g., copper sulphate, chlorine, etc.) into reservoirs and streams to protect aquatic resources.

#### **Fisheries**

**Policy AR6** Prohibit artificial stocking or other introduction of non-native fish into existing watershed aquatic habitat to conserve native biodiversity.

#### **Impact Assessment for Future Projects**

**Policy AR7** Require a site-specific analysis prior to proposed facility and infrastructure projects and proposed construction projects to determine the presence of sensitive aquatic resources and the potential effects of the project on aquatic resources. Analyses will be conducted in accordance with all ap-



*Niles Dam and Fish Ladder*

plicable State and Federal laws, statutes, and guidelines.

### **Management and Coordination**

**Policy AR8** Manage the watershed's aquatic resources in cooperation with State, Federal, and local agencies, as well as scientific institutions.

**Policy AR9** Cooperate with stream management organizations to protect and enhance aquatic habitat of streams in the hydrologic watershed.

**Policy AR10** Prohibit selected classes of activities, or limit land use type, duration, and intensity within the high water quality vulnerability zones, consistent with other management elements in this Plan.

### **Mitigation Banking**

**Policy AR11** Promote wetland mitigation banking to offset impacts to wetlands from SFPUC activities on SFPUC lands. 

## 4.7 Cultural Resources (CR)



### *Secondary Goal: Preserve and Enhance the Ecological and Cultural Resources of the Watershed*

Policies addressing cultural resource management have been developed as part of this Plan to protect and enhance the watershed’s cultural resources. These policies aim to protect and preserve historic structures and features, require consultation with Native American organizations, monitor known cultural resource sites, identify potential adverse impacts to cultural resources caused by future projects, and enhance knowledge of existing cultural resources within the watershed.

Cultural resources policies have been organized into the following topic areas:

- Preservation and Protection of Cultural Resources
- Coordination and Consultation
- Monitoring, Future Studies, and Education
- Impact Assessment for Future Projects

#### **Preservation and Protection of Cultural Resources**

**Policy CR1** Preserve where possible historic structures and features and protect them from deterioration, removal, demolition, vandalism, or severe alterations.

**Policy CR2** Provide the highest level of priority to the protection and preservation of cultural resources eligible for or listed on the National Register of Historic Places or the California Register of Historic Places.

**Policy CR3** Provide appropriate and adequate protection for cultural resource sites subject to public access.

**Policy CR4** Protect submerged cultural resources from damage and vandalism when exposed in reservoirs during low water conditions.

#### **Coordination and Consultation**

**Policy CR5** Consult and coordinate with appropriate Native American organizations regarding cultural resource preservation and protection, where applicable.

**Policy CR6** Provide access to Federally recognized Native American organizations with a historic link to the watershed, including access to burial grounds and sacred sites used for traditional ceremonies or rites, if practicable.

**Policy CR7** Restrict circulation of known cultural resource site descriptions to appropriate watershed management per-



**Secondary Goal:**  
**“Preserve the Cultural Resources of the Watershed”**



*Sunol Water Temple*

sonnel and qualified professionals only to avoid adverse effects on resources.

**Monitoring, Future Studies, and Education**

**Policy CR8** Enhance knowledge of cultural resources by encouraging, where feasible, the evaluation of archaeological sites, historic structures, and historic/archaeological features.

**Impact Assessment for Future Projects**

**Policy CR9** Require a site-specific analysis prior to, as well as ongoing monitoring of, all facility and infrastructure projects, operations and maintenance

activities, and proposed construction projects which involve disturbance to or the movement of soils to determine the presence of sensitive cultural resources and the potential effects of the activity on known and potentially occurring cultural resources. Analyses shall be conducted in accordance with all applicable State and Federal laws, statutes, and guidelines and conducted by a certified and trained archeological specialist. 

## 4.8 Fire (F)



### *Secondary Goal: Protect the Watersheds, Adjacent Urban Areas, and the Public From Fire and Other Safety Hazards*

Fire is a particular concern on the Alameda Watershed; the watershed is near populated urban areas and the buildup of fuels can pose a risk to public safety. A wildfire could have tremendous impacts on water quality, water supply, and ecological and cultural resources, as well as to the aesthetics of the watershed and to adjacent residential areas. If properly managed, however, use of fire as a vegetation management tool can be both beneficial and economical to the watershed ecosystem and have little impact on water quality, water supply, and aesthetics. To protect against wildfire hazards, policies focus on supporting fire pre-suppression efforts including fuel management activities and prescribed burns, restricting public access during high fire hazard periods, regulations compliance, staff training, controlling fire suppression activities, and using grazing as a fire management tool.

Fire policies have been organized into the following topic areas:

- Protection of Natural and Cultural Resources
- Fire Pre-Suppression
- Fire Suppression
- Access Control and Management

- Coordination and Monitoring
- Fuel Management

### **Protection of Natural and Cultural Resources**

**Policy F1** Conduct fire defense, management, and suppression activities in such a manner that natural and cultural resources are adequately protected from damage.

### **Fire Pre-Suppression**

**Policy F2** Prohibit smoking, fireworks, and other activities likely to cause a fire as well as equipment that has not been properly equipped, serviced, and maintained in order to prevent fires.

**Policy F3** Require all lessees and permittees to conduct fire hazard reduction activities.

### **Fire Suppression**

**Policy F4** Suppress fires that threaten life, private property, and/or public safety.

**Policy F5** Provide adequate water supplies, road infrastructure, and equipment to allow fire personnel to effect-



*Secondary Goal:  
“Protect the Watersheds From Fire”*



*Calaveras Watershed Grasslands*

ively respond to and suppress fires on the watershed.

**Policy F6** Provide staff training to adequately detect, respond to, suppress, and report on fires on SFPUC lands.

**Access Control and Management**

**Policy F7** Prohibit unsupervised access to the watershed to reduce the risk of fire.

**Policy F8** Restrict access to the watershed, implement strict fire hazard reduction practices, and initiate the public notification process during periods of extreme fire hazard.

**Coordination and Monitoring**

**Policy F9** Coordinate fire management activities with the CDF and other mutual-aid fire protection agencies.

**Policy F10** Monitor the effects of fire management activities.

**Fuel Management**

**Policy F11** Use a combination of prescribed fire, shaded fuel breaks, and mechanical manipulation to control and manage fuels as appropriate.

**Policy F12** Require that fuel treatment activities be conducted in an ecologically sound manner to the greatest extent possible and that when prescribed burning is undertaken, it strives to mimic natural fire regimes. If mowing and disking are both feasible management tools, mowing is the preferred strategy from an environmental perspective.

**Policy F13** Actively manage fuels in a timely manner to reduce ignition potential, minimize surface fire spread/compartmentalize fires, reduce/minimize fire intensity, and reduce ember production and distance embers are cast.

**Policy F14** Focus fuel management activities adjacent to the following priority areas: developed areas; watershed facilities and improvements; sensitive natural and cultural resources; major egress and emergency ingress routes; areas of crown fire potential; and on potential and existing fuel breaks.



## 4.9 Safety and Security (S)



### *Secondary Goal: Protect the Watersheds, Adjacent Urban Areas, and the Public From Fire and Other Safety Hazards*

Policies addressing safety concerns focus on procedures that will help prevent safety hazards from occurring on the watershed. These policies aim at reducing the likelihood and/or safety risk associated with seismic and geohazards, public access, and hazardous material spills or other emergency conditions and also address the role of SFPUC staff as both a security force and an emergency response team.

Safety and security policies have been organized into the following topic areas:

- Public Access
- Seismic, Geological, and Hazardous Material Risk
- Response, Monitoring, and Enforcement Procedures
- Liability Issues

#### **Public Access**

**Policy S1** Require that new or expanded recreation activities address and accommodate public safety issues.

**Policy S2** Maintain and enforce a safety and security program for the watershed.

**Policy S3** Reduce the likelihood of dangerous condition liability on the watershed, through periodic safety inspections of improvements and facilities used by the public.

#### **Seismic, Geological, and Hazardous Material Risk**

**Policy S4** Minimize damage from future seismic hazards by avoiding construction of facilities in active fault zones and traces, where feasible.

**Policy S5** Minimize damage from potential mass movement hazards by avoiding construction or other disturbances in known dormant landslides and on slopes greater than 30 percent, without proper engineering.

**Policy S6** Conduct (for SFPUC-owned) and require (for easements) inspection of facilities and utilities near active landslide areas and fault traces following earthquakes and slope failures to assess their stability and integrity, and complete repairs or further monitoring as needed to prevent geohazards.

**Policy S7** Require adequate seismic and static geohazards engineering studies for proposed facilities, infrastructure, and utilities easements within the watershed.



### *Secondary Goal: “Protect the Public From Safety Hazards”*

**Policy S8** Require that utility pipelines within the watershed meet current seismic standards and comply with applicable hazardous materials regulations.

### **Response, Monitoring, and Enforcement Procedures**

**Policy S9** Adhere to identified appropriate response procedures during the following high priority emergency situations:

- A. Toxic spills and leaks
- B. Pipeline damage
- C. Damaged electric transmission and distribution lines
- D. Wildfire
- E. Flooding/inundation
- F. Geologic and soil related disturbance
- G. Human injury accidents.

**Policy S10** Conduct ongoing boat patrols of watershed reservoirs for surveillance and monitoring purposes.

**Policy S11** Members of the LRMS staff, with cooperation from other authorized

law enforcement agencies, shall strictly enforce all rules, and regulations, federal, state, county, and watershed policies to minimize illegal dumping, poaching, and other trespass and illegal activities on the watershed.

### **Liability Issues**

**Policy S12** Require that the types and appropriate levels of insurance coverage held by lessees and permittees be commensurate with the amount of risk and potential liability with which the SFPUC is faced.

**Policy S13** Liability associated with public access on lands leased/managed by EBRPD shall be the responsibility of EBRPD. This provision shall be incorporated into all existing and future lease/management agreements.

**Policy S14** Work with other local agencies to acquire downstream flood and conservation easements over lands where flooding poses significant risks to life and property, and to enhance habitat. 

## 4.10 Watershed Activities (WA)



***Secondary Goal: Continue Existing Compatible Uses and Provide Opportunities for Potential Compatible uses on Watershed Lands, Including Educational, Recreational, and Scientific Uses***

Policies have been developed to address the multitude of existing and potential future activities on the watershed. The policies focus on public access to and use of the watershed; SFPUC operations and maintenance; and coordination with other applicable agencies and organizations.

Watershed activities policies have been organized into the following topic areas:

- Prohibitions and Restrictions on New Activities/Development
- Activities Allowed by Permit
- Recreational Access
- Review Process for Proposed Plans and Projects
- Requirements for New Facilities, Projects, Activities, and Development
- SFPUC Operations and Maintenance Activities
- Evaluation of Existing Activities
- Coordination

**Prohibitions and Restrictions on New Activities/Development**

**Policy WA1** Prohibit activities which are detrimental to watershed resources. Prohibited activities are as follows:

- A. The unauthorized take or possession of fish, amphibians, birds, or invertebrates.
- B. The unauthorized take of vegetation, including flowers, foliage, seeds, fruits, and berries of plants as well as leaf mold, humus, grass, turf, shrubs, cones, ferns, mushrooms, and deadwood.
- C. Swimming and body contact with the water by humans and domestic animals.
- D. Walking of domestic pets, with the exception of guide dogs, search and rescue dogs, and police dogs.
- E. Boating with the exception of SFPUC maintenance, operations, and monitoring activities and in selected emergency storage reservoirs.
- F. Activities which result in direct public access to reservoirs and tributaries (e.g., fishing, new trails at or near shoreline).
- G. Smoking, campfires, and fireworks.
- H. Dumping and littering.
- I. Use of motorized vehicles with the exception of SFPUC maintenance and operations personnel and their agents and, in an emergency, response agencies and their agents.
- J. Use of septic systems on SFPUC lands.



***Secondary Goal:  
“Provide Opportunities for Compatible Uses on Watershed Lands”***

- K. Use of the watershed during periods of extreme fire weather conditions.
- L. Hunting.
- M. All alcoholic beverages.
- N. Unauthorized release and feeding of all animals.
- O. Use of unauthorized firearms, and bows and arrows.
- P. Fishing, except as authorized by the SFPUC.
- Q. Mobile vendor activities.
- R. Unsupervised public access to all existing internal roads/fire roads and trails.
- S. Camping.
- T. Off-trail use by recreational users.
- U. Unauthorized construction of new trails.
- V. Mountain biking, except on specifically designated trails.
- W. Equestrian use, except on specifically designated trails.
- X. New golf courses.

**Policy WA2** Prohibit the construction of new trails and unsupervised access to existing roads and trails not addressed in this Plan.

**Policy WA3** Prohibit the construction of new pipelines through the primary watershed for the transmission of gas, oil, or other hazardous substances. Restrict construction of new hazardous substance pipelines in the secondary watershed to areas of low vulnerability.

**Policy WA4** Prohibit all commercial and non-SFPUC residential development

on primary watershed lands that is not addressed in this Plan. Limit commercial and residential development on secondary watershed lands to that which is compatible with water quality protection, water storage purposes, ecological resource conservation, agricultural conservation, and recreational and visual aesthetics.

**Policy WA5** Prohibit instream mining and/or development along reservoir shorelines and tributary streams which are located within primary watershed lands.

**Policy WA6** Restrict new utility lines proposed on the watershed for the power transmission or tele-communications to existing utility corridors, and require that new power lines be buried, where feasible. All proposed alignments shall undergo a scenic impact analysis.

**Policy WA7** Limit the number of facilities requiring construction of new waste disposal systems on SFPUC lands to those that are essential where possible. Require state-of-the-art waste systems on new or existing facilities.

**Policy WA8** Private concession sales at SFPUC recreation sites shall be limited to those items necessary for the enjoyment and use of recreation opportunities at the site, including usage fees, food and beverages, and recreational equipment rental.

**Policy WA9** Require that new communication facilities (e.g., antennae, satellite dishes, cell towers, etc.) proposed on the watershed which require open and unobstructed sites be sited to minimize the impact to visual resources and wherever possible be co-located with existing facilities. If new facilities require additional new locations, require that watershed studies be conducted to minimize, eliminate, or conceal the violations of scenic values.

### Activities Allowed by Permit

**Policy WA10** The activities listed below shall be allowed on the watershed by SFPUC permit only. Unless otherwise stated, permits shall be limited to one day per permit and for day use hours only. Activities allowed by permit only are:

- A. Overnight use.
- B. Off-trail activities.
- C. Off-road vehicle use except for emergencies or by SFPUC maintenance and operations personnel.
- D. Blasting of explosives.
- E. Open fires.
- F. Trapping and release of introduced fish and wildlife into the watershed.
- G. Collection of plant or animal specimens.
- H. Use of Sunol Water Temple for wedding ceremonies, lectures, meetings, etc.
- I. Collection of State game or State protected fishery and wildlife resources.

- J. Collection of Federally regulated or protected fish and wildlife species.
- K. Supervised public access to existing internal roads/fire roads and trails.
- L. Research/scientific study by non-SFPUC personnel.
- M. Educational activities.
- N. Hunting for, and control of pest species.
- O. Removal of vegetation including timber harvest and/or salvage related to natural resource management activities or to meet fire management goals.

**Policy WA11** Allow access by permit to select areas of the watershed generally closed to the public for scientific research by institutions, agencies, and groups which is compatible with water quality protection and all applicable watershed management goals and policies. Research activity permits shall include:

- A. Permits for use by qualified individuals or groups for the sole purpose of conducting research pertinent to the watershed.
- B. Research may include, but not be limited to: water quality monitoring; botanical and wildlife studies; geophysical, paleontological, archaeological, and cultural research; restoration and enhancement efforts; and analysis of watershed ecological systems and processes.
- C. Researchers shall furnish SFPUC with a copy of all significant resource data, GIS files, results, theses, dissertations, studies, and



*Sunol Water Temple*

reports for inclusion in the Watershed Education Center.

- D. Researchers shall provide interpretive information for use in educational programs, when appropriate.
- E. Permit duration shall be dependent on specific research requirements and granted on an individual and project-specific basis.

**Policy WA12** Allow supervised access by permit to select areas of the watershed generally closed to the public for educational activities. Educational activity permits shall include:

- A. Permits for groups with the purpose of educating persons on aspects inherent to the watershed.
- B. Educational activities may include, but not be limited to: wildlife and wildflower observation, watershed ecological processes analysis, and volunteer restoration and enforcement efforts.
- C. These permits shall be limited to day use only.
- D. Groups shall be limited to no more than 25 persons.

**Recreational Access**

**Policy WA13** Proposed recreation activities shall be compatible with their landscape setting, shall not adversely affect watershed resources, and shall comply with the goals and policies in this Plan.

**Policy WA14** New recreation and public access activities in the primary wa-

tershed shall be resource-based, outdoor recreation or educational activities only. Resource-based recreation includes uses that are integrally dependent upon the inherent natural, scenic, and/or cultural resources present, but do not adversely affect those resources upon which they depend. For the Alameda Watershed, this is limited to hiking, nature study, wildlife viewing, sightseeing, and visiting education centers.

**Policy WA15** Limit open public access to recreational trails on the periphery of the watershed to minimize disturbance to sensitive wildlife and vegetation communities, reduce chance of fire ignition, minimize spread of weeds, and cause the least disruption to wildlife movement resulting from trailside fencing.

**Policy WA15.1** Existing public trails as of January 2000 shall remain open to individuals and groups without a permit except where a permit is currently required.

**Policy WA15.2** The addition of new trails in zones of lesser vulnerability and risk will be considered where consistent with the goals and policies of this plan.

**Policy WA15.3** Retain existing public trails, defined as public trails as of January 2000, and the activities allowed upon them. Encourage the most active trail use upon these trails.

**Policy WA15.4** Support new trail connections that link to adjacent commu-

nities and to the trail facilities of other agencies, where the new trail connection is in a zone of lesser vulnerability and risk.

**Policy WA16** Inform all individuals allowed entry into the watershed, either by permit or open access, of the watershed's primary purpose and the rules and regulations governing watershed activities.

**Policy WA17** All individuals and groups granted permits to watershed lands shall be charged user fees to cover the operational costs of the Watershed Information and Permit Reservation System and other SFPUC costs associated with the use of SFPUC facilities and backcountry access.

**Policy WA18** Manage a volunteer docent program to accommodate supervised access to the watershed.

**Policy WA18.1** Consider expansion of existing golf courses in zones of low vulnerability/sensitivity.

### **Review Process for Proposed Plans and Projects**

**Policy WA19** To ensure that all future land management decisions and uses remain consistent with the goals and policies set forth in this Plan, all proposed plans and projects on the watershed shall be reviewed according to the process illustrated in Figure 4-1, Review Process for Proposed Plans and Projects.

All proposed plans and projects on the watershed shall be analyzed for compliance with the goals and policies set forth in the Watershed Management Plan and must undergo this review process prior to being approved or denied. The SFPUC is responsible for making final determination as to whether a particular plan or project is compatible with the goals and policies of the watershed management plan and should proceed through the environmental review process. LRMS staff are responsible for making recommendations to aid the SFPUC decision-making process.

**Policy WA20** Should the SFPUC determine that the proposed plan/project would not comply with the watershed goals and policies then LRMS staff shall make appropriate comments so that the applicant may bring the proposed plan/project into compliance with the Watershed Management Plan.

**Policy WA21** All costs associated with reviewing, analyzing, and making decisions related to future plans and projects proposed on the watershed shall be borne by the plan/project applicant.

### **Requirements for New Facilities, Projects, Activities, and Development**

**Policy WA22** Proposals for new facilities, structures, roads, trails, projects and leases, or improvements to existing facilities shall be:

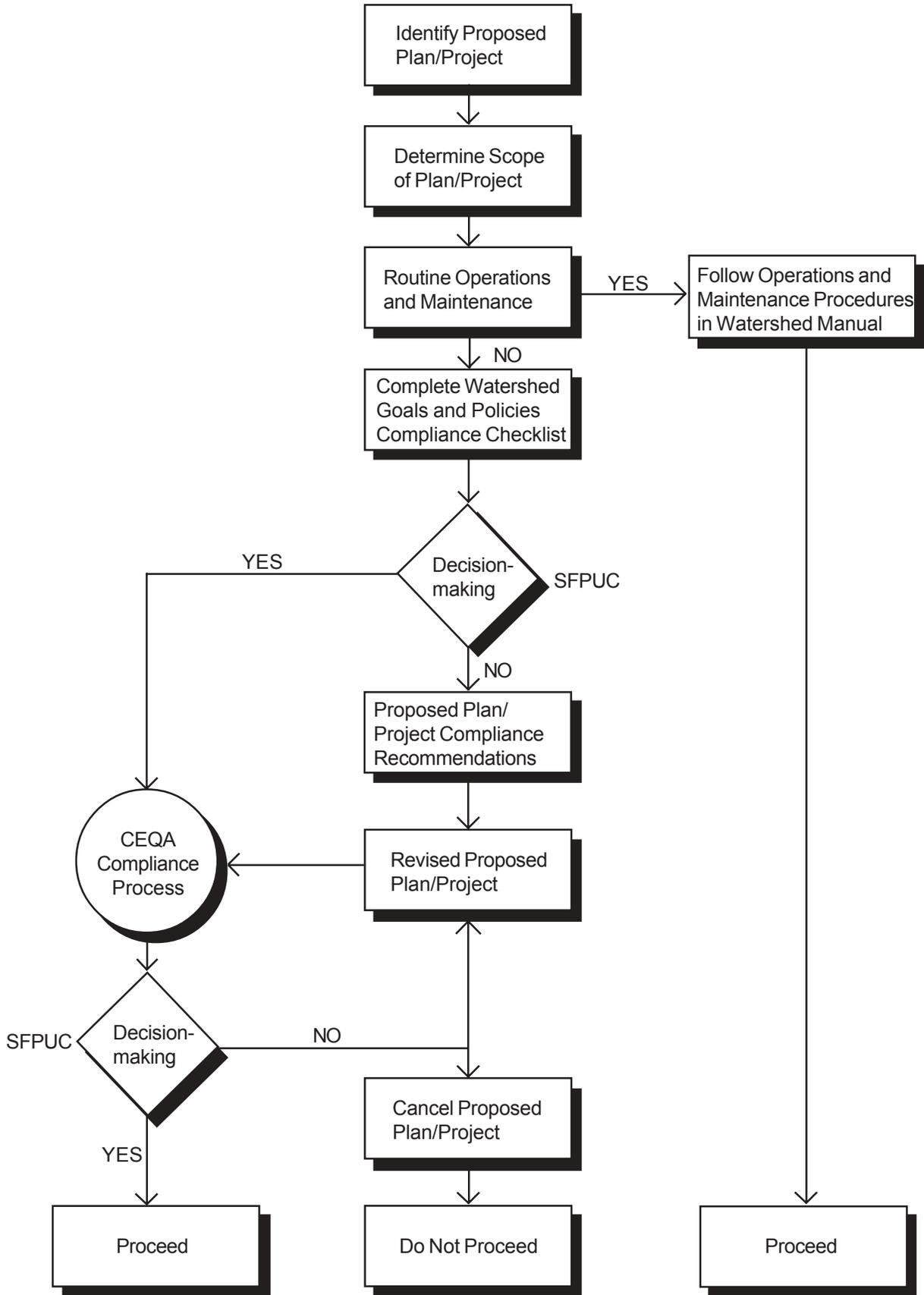


Figure 4-1 Review Process for Proposed Plans and Projects

- A. Limited to essential public services and not attractions unto themselves, but incidental to the primary purposes of the watershed (water quality protection and water supply), or to its enjoyment and conservation in its natural condition, or to the education/interpretation of watershed values.
- B. Limited to zones of low vulnerability and risk.
- C. Designed, sited, constructed, and maintained to blend with the natural landscape and conform with the goals and policies set forth in this Plan.
- D. Reviewed by appropriate SFPUC personnel to ensure compliance with all applicable Federal, State, and local laws, as well as SFPUC rules and regulations.
- E. Non-water related projects shall be approved only if potential impacts on the quality and quantity of the water supply and natural environment would be insignificant or mitigated to a level of insignificance. Water related projects may be subject to a finding of overriding considerations on a case-by-case basis.
- F. Monitored by appropriate SFPUC personnel to evaluate the potential occurrence of impacts and to prescribe specific mitigation prescriptions to protect watershed values.
- G. Design and site overpasses, safety, and directional signs and other road and highway structures to be unobtrusive to the surrounding landscape.

- H. Design and site new facilities, structures, roads, and trails to minimize, wherever possible, grading and the visibility of cut banks and fill slopes.

**Policy WA23** Require that all development, except for water-dependent structures, be excluded from the high water quality vulnerability zone and be set back from the ordinary high water mark of reservoirs and from the centerline of all watershed tributaries.

**Policy WA24** Require that all proposed development involving any grading of land include the submittal of a grading plan to SFPUC to retain the existing topography where feasible, minimize grading, minimize the impacts on scenic, ecological, and cultural resources, and minimize off-site soil loss from erosion.

**Policy WA25** All lessees and permittees requiring the use of pesticides shall comply with the provisions of the CCSF's City Pesticide Management Plan Ordinance (No. 274-97) and the SFPUC Integrated Pest Management Plan and submit a proposed pesticide use budget and record of pesticide applications and a Chemical Application Management Program (CHAMP), both to be approved annually by the IPM Coordinator and the Water Quality Bureau.

**Policy WA26** All maintenance, operation, and construction activities shall incorporate Best Management Practices (BMPs), as applicable.

**Policy WA27** Enforce strict design and siting standards for all signage on the watershed.

**Policy WA28** All proposed plans and projects shall be subject to review under CEQA and/or NEPA, where applicable. SFPUC staff are responsible for overseeing the CEQA compliance process.

**Policy WA29** Require the use of LRMS GIS as an integral part of watershed planning efforts.

**Policy WA30** Prior to initiating new construction, consider re-use of existing structures for departmental uses.

**Policy WA31** Provide universal access in the design of all new and modified facilities, structures, trails, and programs to the maximum extent practicable. At a minimum, all applicable trails, facilities and programs shall meet legally mandated accessibility standards (per the Americans with Disabilities Act of 1990 [ADA], and the 1991 ADA Accessibility Guidelines; Section 504 of the Rehabilitation Act of 1973, as amended in 1978; and Title 24 of the California Building Code).

**Policy WA32** A reclamation plan shall be required and adhered to for all existing and any new mineral, sand, and gravel extraction sites as approved by SFPUC. Plans shall be approved by the SFPUC and other applicable State

and local agencies prior to any new or expanded development.

### **SFPUC Operations and Maintenance Activities**

**Policy WA33** To avoid unintentional or inadvertent impacts to watershed resources, the LRMS staff shall administer, manage, direct, and supervise all watershed operations and maintenance activities. Operations and maintenance activities include road maintenance, mowing, road grading, slide repair, controlled burning, etc.

**Policy WA34** To avoid unintentional or inadvertent impacts to watershed resources, all water system maintenance activities should be handled in an advisory fashion, with consultation and concurrence of LRMS staff. Supervision and project management of these projects should be delegated to SFPUC staff (e.g., plumbers, resident engineers, or project managers) who are specially trained in watershed protection practices.

### **Evaluation of Existing Activities**

**Policy WA35** Periodically evaluate ongoing and proposed activities for compatibility with the goals of this Plan.

### **Coordination**

**Policy WA36** Review and/or participate in comprehensive land management planning efforts on adjacent lands

potential actions that may affect EBRPD leased lands or involve development of public use facilities or trails/trail-access.

### **Sunol Valley**

**Policy WA37** Manage the timing and location of mining in the Sunol Valley to expedite the creation of water storage facilities while minimizing the impacts to natural, cultural, and aesthetic resources, and maximizing revenues from gravel extraction and other revenue sources (e.g., increased water sales, recreation, vineyards, and nurseries).

**Policy WA38** Promote the development of recreational amenities in the Sunol Valley, including water-based recreation, as compatible with future quarry water supply reservoirs.

**Policy WA39** Prohibit body contact with water in the Sunol Valley reservoirs.

**Policy WA40** Allow non-motorized boating and fishing in one of the Sunol Valley Reservoirs. 

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## 4.11 Administration and Finance (AF)



***Secondary Goal: Provide a Fiscal Framework that Balances Financial Resources, Revenue-generating Activities, and Overall Benefits, and an Administrative Framework that Allows Implementation of the Watershed Management Plan***

Policies have been developed regarding administration of the watershed and financing of watershed programs and activities. These policies focus on staffing responsibilities and training, funding sources, and allocation relative to watershed activities as well as cost/benefit analysis.

Administration and finance policies have been organized into the following topic areas:

- Staffing - Responsibility and Training
- Funding Allocation/Sources
- Cost/Benefit Analyses and Considerations
- Coordination

### **Staffing - Responsibility and Training**

**Policy AF1** LRMS staff shall be responsible for, and shall have authority over, general administration/management of watershed management policies and associated actions.

**Policy AF2** SFPUC staff shall be knowledgeable of the Plan goals and policies and shall be adequately trained to

implement, or supervise implementation of, all management actions and guidelines.

**Policy AF3** SFPUC and LRMS staff shall stay abreast of and adhere to all applicable new laws, rules, regulations, and listings by USFWS and CDFG, as well as other appropriate agencies.

**Policy AF4** Provide appropriate staff levels and associated support structure (e.g., materials, equipment) to facilitate the implementation of, and compliance with, all Plan goals, policies, and management actions.

**Policy AF5** Provide SFPUC employees with relevant information regarding water quality; water conservation; natural and cultural resource protection; and SFPUC policies, initiatives, and priorities.

### **Funding Allocation/Sources**

**Policy AF6** Funding for watershed operations and maintenance activities, equipment, training, etc. shall be allocated at levels that are appropriate to meet all applicable Plan goals, policies, and management actions.



***Secondary Goal:  
“Provide a Fiscal Framework that Balances Financial Resources”***

**Policy AF7** Funding for the administration and management of watershed activities (i.e., leases, permits, and public use) that are not related to water quality, water supply, and responsible watershed management and protection shall be borne by the parties benefiting from the uses specific to those activities.

**Policy AF7.1** The cost of providing recreational facilities and docents shall not be borne by the water rate payers.

**Policy AF8** Finance the purchase of watershed lands and/or easements outside of SFPUC ownership that are critical to watershed water quality and supply, or may be used for mitigation banking in connection with habitat conservation or project-related mitigation activities.

**Policy AF9** Ensure that the costs associated with the construction and operation of Sunol Valley recreation facilities are not borne by the rate payers.

**Policy AF10** Consider the sale of SFPUC property in the secondary watershed which does not directly impact the reservoir water quality or future water supply operational requirements and use the proceeds to purchase non-SFPUC primary watershed lands (or conservation easements over these lands) which are critical to water quality.

## **Cost/Benefit Analyses and Considerations**

**Policy AF11** Require that the costs of the permit process be borne by the applicant either directly through recreation permit fees or indirectly through increased lease fees.

**Policy AF12** Require that direct and indirect benefits associated with watershed leases, permits, and public access activities meet or exceed direct and indirect costs.

**Policy AF13** Prior to making changes to existing or implementing new operations and maintenance activities, SFPUC staff or contractor shall determine the relative costs and benefits (in terms of erosion and sedimentation) for alternative locations or types and intensities of the proposed land use or activity; possible future corrective actions (slope repairs and maintenance); and/or increased maintenance costs for downslope sediment capture and removal.

## **Coordination**

**Policy AF14** Actively participate in local and regional government planning processes.

**Policy AF15** Coordinate with and integrate data between the LRMS's GIS and the GIS and other systems of SFPUC organizational units. 

## 4.12 Public Awareness and Agency Participation (PA)



### *Secondary Goal: Enhance Public Awareness of Water Quality, Water Supply, Conservation, and Watershed Protection Issues*

The watershed offers incomparable opportunities to educate and inform students of all ages about water quality, water supply, water conservation, natural resources, and watershed protection issues. The resources of the watershed provide an opportunity for future generations to appreciate these varied resources and better understand their responsibility for maintaining this valued heritage for future generations.

As part of enhancing public awareness it is also important to provide opportunities to educate decision makers and to make the public aware of the numerous SFPUC careers related to water quality protection and watershed management.

Policies have been developed to enhance public awareness of water quality, water supply, conservation, and watershed protection issues. The policies focus on educating the general public and upstream landowners, as well as interjurisdictional coordination with other agencies and organizations.

Public awareness policies have been organized into the following topic areas:

- Public Education
- Coordination

- Research and Monitoring

### **Public Education**

**Policy PA1** Educate the public on the importance of protecting their water supplies and on measures to minimize risk.

**Policy PA2** Foster and support public information and educational programs that emphasize individual and community responsibility for resource protection and conservation, and foster an appreciation for the history, cultural resources, biology, ecology, and water supply system of the watershed.

**Policy PA3** Foster individual public awareness programs for: (a) visitors to the watershed; (b) lessees, landowners, and others within the hydrologic region that may have direct impacts upon the watershed; (c) outreach education efforts (e.g., schools, conferences, seminars); and (d) the general public.

**Policy PA4** Encourage and support, in coordination and cooperation with local school districts and colleges, educational use of the watershed and the watershed GIS data for ecological sciences curriculum.



*Secondary Goal:  
“Enhance Public Awareness of Watershed Protection”*

**Policy PA5** Provide educational opportunities for underprivileged groups, school children, and families to visit and learn about the watershed.

### **Coordination**

**Policy PA6** Encourage agencies with jurisdiction over watershed lands outside of SFPUC control to adopt similar regulations, management practices, and ordinances to protect water quality and watershed lands.

### **Research and Monitoring**

**Policy PA7** Encourage and allow investigations of natural resources on the watershed for scientific research and

education to increase the general understanding of these resources and their condition.

**Policy PA8** Conduct research and monitoring activities through collaborative and cooperative efforts with other agencies/groups whenever possible.

**Policy PA9** Restrict dissemination of maps identifying sensitive resources (e.g., ecological and cultural resources) to appropriate watershed personnel and qualified professionals only to avoid possible resource disturbance through inadvertent disclosure of site information to unauthorized personnel. 



**Chapter 5:  
Watershed Management  
Actions and Guidelines**

## Chapter 5. Watershed Management Actions and Guidelines

### 5.1 Introduction

The previous chapter presented the goals and policies to be used by the SFPUC to make decisions regarding watershed management. This chapter presents the management actions and guidelines which serve to implement the goals and policies. The management actions are specific tasks and are intended to guide SFPUC staff and LRMS staff in the day-to-day activities required to properly manage the watershed. Guidelines provide additional direction and clarification for selected management actions. Management actions are intended to be implemented over the next 25 years and are included here because they are the most appropriate actions for management of the watershed at the present time. Inclusion of these actions does not ensure that funding, staff, or equipment will be available to implement these actions nor does it obligate the SFPUC to implement actions it chooses not to.

Rather than being organized by goal as previous chapters were, this chapter is organized by management topic to facilitate ease of use by SFPUC and LRMS staff. The management topics are the functional areas (e.g., roads, stormwater, vegetation) which are already managed by SFPUC and LRMS staff.

Table 5-1 indicates the goals and policies from which the management actions are derived. As mentioned above, the management actions implement the goals and policies. In the table, a circle designates that the action directly implements a specific goal and its policies. A diamond indicates that the action has an indirect role in implementing a specific goal and its policies. For example, the management actions set forth under Waste - Human and Animal directly implement the water quality goal and policies. These actions are designed to prevent human and animal waste from entering the reservoirs and contaminating the water supply. Alternatively, the actions for Aquatic Zone Protection indirectly implement the water quality goal and policies but these actions also directly protect fishery resources and wildlife. In keeping with the primary goal of water quality protection, most of the management actions either directly or indirectly implement the water quality goal and policies.

Table 5-2 includes a list of the 22 management action topics and sub-topics as well as their applicable section number, acronym, and location within the chapter. The sub-topics provide further clarity and readability. Many of

*“Management actions are specific tasks, intended to guide staff in the day-to-day activities required to properly manage the watershed”*

the management actions also refer the reader to other relevant topics and/or actions. Although certain management actions may be applicable to several topics, actions are listed only once in this chapter, under the topic which is most relevant.

Each action includes, in boldface type, a set of key words which summarizes the management action. These key words are carried forward into Chapter 6: Phasing and Implementation, where each action is assigned a phasing priority. Coordination responsibilities and related actions are also identified in Chapter 6.

Codes are included in Chapter 5 to identify the phase in which each action is proposed to occur. These codes are:

- Phase 1: within five years of plan adoption;
- Phase 2: within ten years of plan adoption;
- Phase 3: within twenty years of plan adoption; and/or
- (A): on an As-Needed basis
- (B) at regular intervals throughout the life of the Plan.

Coding of actions can be either a phase number, a combination of phase num-

ber and an (A) or (B) or an (A) or (B) alone. For example an action can be identified as Phase 1 indicating it should commence within the five years of Phase 1 adoption. An action can also be identified as Phase 1A indicating that it should commence in Phase 1 and recur on an as-needed basis. An action can also be identified as Phase A indicating that the time of commencement of the action is uncertain but the action should occur on an as-needed basis. Phase A actions are generally related to proposals for new projects on the watershed. There are no actions which are Phase B alone.

Several actions included in this chapter are alternatives for the same action. These actions have the same number and a letter identifies the alternatives after the action number (e.g. Action sun2a, sun2b). The EIR will evaluate the alternative actions and determine which one is environmentally preferable. The SFPUC, when adopting the Watershed Management Plan, will adopt only one of the alternative actions.

For a more detailed discussion of phasing please refer to Chapter 6. 

WATERSHED MANAGEMENT GOALS AND POLICIES

							
		Water Quality	Water Supply	Ecological and Cultural Resources			
				Vegetation	Wildlife	Aquatic Resources	Cultural Resources
WATERSHED MANAGEMENT ACTIONS AND GUIDELINES	Stormwater (sto)	●	◆			◆	
	Hazardous Materials & Contaminants (haz)	●	◆			◆	
	Waste - Human & Animal (was)	●	◆			◆	
	Roads (roa)	●	◆			◆	
	Conservation & Reclamation of Water (con)		●				
	Fire Management (fir)	●	◆	◆			
	Safety and Security (saf)	◆					
	Vegetation & Soil Management (veg)	●	◆	●			
	Wildlife (wil)				●		
	Aquatic Zone Protection (aqu)	●	◆				
	Fisheries (fis)					●	
	Cultural Resources (cul)						●
	Environmental Compliance (env)	◆		◆	◆	◆	◆
	Lease & Permit Requirements (lea)	●	◆				◆
	Public & Agency Outreach (pub)	◆	◆	◆	◆	◆	◆
	Staffing & Training (sta)	●	◆	●	●	●	●
	Fiscal Framework (fic)	◆	◆	◆	◆	◆	◆
	Information Management (inf)	◆	◆	◆	◆	◆	◆
Design & Construction Requirements (des)	●	◆	◆	◆	◆	◆	
Sunol Valley (sun)	◆	●				◆	
Grazing Management (gra)	●	◆	◆	◆	◆		

WATERSHED MANAGEMENT GOALS AND POLICIES

- Directly Achieves Goal
- ◆ Indirectly Achieves Goal

						
		Fire and Safety		Watershed Activities	Administration and Finance	Public Awareness
		Fire	Safety & Security			
WATERSHED MANAGEMENT ACTIONS AND GUIDELINES	Stormwater (sto)				◆	◆
	Hazardous Materials & Contaminants (haz)				◆	◆
	Waste - Human & Animal (was)				◆	◆
	Roads (roa)	◆			◆	
	Conservation & Reclamation of Water (con)				◆	◆
	Fire Management (fir)	●	◆		◆	◆
	Safety and Security (saf)	◆	●		◆	◆
	Vegetation & Soil Management (veg)	◆			◆	◆
	Wildlife (wil)					
	Aquatic Zone Protection (aqu)				◆	
	Fisheries (fis)					◆
	Cultural Resources (cul)					◆
	Environmental Compliance (env)		◆		◆	
	Lease & Permit Requirements (lea)				◆	◆
	Public & Agency Outreach (pub)	◆	◆	●	◆	●
	Staffing & Training (sta)	●	●	◆	◆	◆
	Fiscal Framework (fic)				●	
	Information Management (inf)	◆	◆			◆
Design & Construction Requirements (des)		◆		◆		
Sunol Valley (sun)			◆	◆	◆	
Grazing Management (gra)	◆		◆	◆	◆	

Table 5-1 Derivation of Watershed Management Actions from Goals and Policies

<b>Section</b>	<b>Management Topic</b>	<b>Acronym</b>	<b>Page Number</b>
5.2	Stormwater	sto	5.2-1
5.3	Hazardous Materials and Contaminants <ul style="list-style-type: none"> <li>• SFPUC Facilities and Procedures</li> <li>• Spill Containment and Response</li> <li>• Coordination and Collaboration</li> </ul>	haz	5.3-1
5.4	Waste - Human and Animal <ul style="list-style-type: none"> <li>• SFPUC Facilities and Procedures</li> <li>• Lessees and Non-SFPUC Facilities</li> <li>• Additional Surveys and Monitoring</li> <li>• Coordination and Collaboration</li> </ul>	was	5.4-1
5.5	Roads <ul style="list-style-type: none"> <li>• Assessment and Management of Existing Roads</li> <li>• New Roads</li> </ul>	roa	5.5-1
5.6	Conservation and Reclamation of Water	con	5.6-1
5.7	Fire Management <ul style="list-style-type: none"> <li>• Fire Pre-Suppression</li> <li>• Fire Defense Improvement</li> <li>• Fuel Management</li> <li>• Fire Response</li> <li>• Fire Management Plan Implementation</li> <li>• Monitoring</li> </ul>	fir	5.7-1
5.8	Safety and Security <ul style="list-style-type: none"> <li>• Law Enforcement</li> <li>• Safety and Security Program</li> <li>• Watershed Reservoir Patrol</li> <li>• Watershed Manual</li> <li>• Coordination and Collaboration</li> </ul>	saf	5.8-1
5.9	Vegetation, Soil, and Pest Management <ul style="list-style-type: none"> <li>• Vegetation Management Plan</li> <li>• Assessment Prior to New Activities</li> <li>• Exotic Species</li> <li>• Restoration</li> <li>• Soils Management</li> <li>• Integrated Pest Management</li> <li>• Coordination and Collaboration</li> </ul>	veg	5.9-1
5.10	Wildlife <ul style="list-style-type: none"> <li>• Assessment Prior to New Activities</li> <li>• Wildlife Movement</li> <li>• Wildlife Habitat</li> <li>• Sensitive, Rare, Threatened and Endangered Species</li> <li>• Future Studies and Monitoring</li> </ul>	wil	5.10-1
5.11	Aquatic Zone Protection <ul style="list-style-type: none"> <li>• Assessment Prior to New Activities</li> <li>• Reservoirs and Reservoir Shorelines</li> <li>• Stream Channels and Banks</li> <li>• Wetlands</li> <li>• Sedimentation Basin Management</li> <li>• Monitoring</li> </ul>	aqu	5.11-1
5.12	Fishery Resources <ul style="list-style-type: none"> <li>• Fish Migration</li> <li>• Habitat Management</li> <li>• Future Studies and Monitoring</li> </ul>	fis	5.12-1

**Table 5-2 Management Action Topics, Acronyms, and Page References**

<b>Section</b>	<b>Management Topic</b>	<b>Acronym</b>	<b>Page Number</b>
5.13	Cultural Resources <ul style="list-style-type: none"> <li>• Assessment Prior to New Activities</li> <li>• Protection of Existing Resources</li> <li>• Monitoring</li> </ul>	cul	5.13-1
5.14	Environmental Compliance <ul style="list-style-type: none"> <li>• Environmental Compliance Responsibilities</li> <li>• Assessment Prior to New Activities/Leases</li> <li>• EIR Mitigation Measures</li> <li>• Coordination and Collaboration</li> </ul>	env	5.14-1
5.15	Lease and Permit Requirements <ul style="list-style-type: none"> <li>• Public Access Permits</li> <li>• Land Use Lease and Permit Requirements</li> </ul>	lea	5.15-1
5.16	Public and Agency Outreach <ul style="list-style-type: none"> <li>• Public Education Program</li> <li>• Facilities and Information</li> <li>• Docent Program</li> <li>• Coordination and Collaboration</li> </ul>	pub	5.16-1
5.17	Staffing and Training <ul style="list-style-type: none"> <li>• Staffing</li> <li>• Enforcement Procedures Training</li> <li>• Watershed Resource and Watershed Management Plan Training</li> <li>• Fire Management and Emergency Response Training</li> </ul>	sta	5.17-1
5.18	Fiscal Framework <ul style="list-style-type: none"> <li>• Costs and Benefits of Watershed Activities</li> <li>• Lease and Permit Fees</li> <li>• Watershed Management Funding</li> <li>• Funding Sources</li> <li>• Acquisition of Watershed Lands</li> <li>• Fines</li> </ul>	fic	5.18-1
5.19	Information Management <ul style="list-style-type: none"> <li>• Watershed Natural Resources Center</li> <li>• GIS Operations and Database Maintenance</li> <li>• Watershed Web Page Maintenance</li> <li>• Coordination and Collaboration</li> </ul>	inf	5.19-1
5.20	Design and Construction Requirements <ul style="list-style-type: none"> <li>• Review Process for Proposed Plans and Projects</li> <li>• Construction Fencing</li> <li>• Design Guidelines</li> <li>• Accessibility Compliance</li> </ul>	des	5.20-1
5.21	Sunol Valley <ul style="list-style-type: none"> <li>• Gravel Mineral Resources</li> <li>• Reservoir Design Considerations</li> <li>• Reservoir Operations</li> <li>• Water Quality Monitoring</li> <li>• SFPUC Facilities</li> <li>• Recreation and Other Activities</li> <li>• Economic Resources</li> </ul>	sun	5.21-1
5.22	Grazing Management <ul style="list-style-type: none"> <li>• Grazing Management Strategy</li> <li>• Grazing Lease Strategy</li> <li>• Watershed Protection Areas and Improvements</li> <li>• Watershed Monitoring</li> </ul>	gra	5.22-1

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## 5.2 Stormwater (sto)

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Stormwater runoff is the overland flow of precipitation. Stormwater from the local watersheds contribute approximately five to ten percent of the water system's total supply. As such, the quality and maintenance of this important resource is integral to maintaining high quality water. Impervious or highly compacted surfaces (such as roads and parking lots) represent the areas of greatest concern with regard to stormwater. Approximately 51 miles of paved roads including portions of I-680, Calaveras Road, and Niles Canyon Road and 106 miles of unpaved roads and trails are located on the Alameda Watershed. These dense surfaces accelerate the rate of flow, and subsequently increase the potential for downstream erosion, which affects water quality and water supply (by reducing reservoir storage capacity). In addition, roads and parking lots are a source of contaminants (e.g., motor oil, etc.) and flows over these areas likewise affect water quality.

The actions presented in this section are focused on proactively managing existing stormwater drainage facilities and incorporating the use of alternative technologies wherever feasible, with an emphasis on water quality. Additional actions which are related to stormwater management but are more appropriately addressed in other sections include:

- actions relating to road management (Section 5.5: Roads)
- actions relating to soils management (Section 5.9: Vegetation, Soil, and Pest Management).

For additional detail on recommended BMPs, refer to Appendix C-6.

**Action sto1 (Phase 2A)** Assess the **on-site stormwater** collection and drainage **systems** at SFPUC facilities, Sunol Water Temple, applicable EBRPD facilities, the Sunol Valley Golf Course, quarries, and nurseries for adequate sizing and erosion. Remediate where necessary by establishing preventive maintenance programs, infiltration drainfields and trenches, or wet and dry detention basins to optimize the quality of stormwater which flows into reservoirs and tributaries. Guidelines include:

- A. Determine appropriate storm drain outlet locations to develop water quality detention basins which capture stormwater and filter out undesirable water quality constituents. This can be accomplished through vegetated filter strips/swales, porous soils, first-flush diversions, wetlands, and other BMPs identified in Appendix C-6 for stormwater quality control.
- B. Direct pollutant loadings away from bridge decks by diverting runoff to land for treatment. Effort and sizing should be focused on

first-flush events (capturing the highest concentration of contaminants during the first significant rainfall of the season).

- C. Assess structural features allowing isolation of hazardous materials spills prior to reaching reservoirs or tributaries.
- D. Develop a monitoring program for stormwater runoff areas of concern to establish baseline conditions (e.g., roads with heavy vehicle usage proximate to waterbodies). Continue monitoring after implementation of BMPs to measure any improvements. Conduct regular inspection of storm drainage facilities to ensure proper operation.
- E. Maintain up-to-date plans of roadway storm drainage systems and include stormwater contamination assessment and spill prevention plan.



### 5.3 Hazardous Materials and Contaminants (haz)

The use, storage, and/or occurrence of hazardous substances in the watershed is associated with three basic activities: standard SFPUC maintenance practices (e.g., application of herbicides for vegetation management, use of petroleum products for SFPUC vehicle/equipment operations and maintenance, etc.); public uses such as major roadways; and existing areas containing potential contaminants (i.e., asbestos-containing serpentine formation along north slope of Alameda Creek). Proper management of hazardous substances is essential to the preservation and maintenance of water quality.

The management actions for hazardous materials and contaminants provided in this section are divided into the following topics:

- SFPUC Facilities and Procedures
- Spill Containment and Response
- Coordination and Collaboration

Additional actions related to hazardous materials and contaminants but more appropriately addressed in other sections include:

- backwash disposal procedures (Section 5.4: Waste - Human and Animal);
- runoff of vehicle related contaminants (Section 5.5: Roads);
- the application of fire suppression chemicals (Section 5.7: Fire Management);

- development of emergency response plans and procedures (Section 5.8: Safety and Security);
- the use of pesticides, and other chemicals (Section 5.9: Vegetation, Soil and Pest Management); and
- requirements for lessees dealing with hazardous materials (Section 5.15: Lease and Permit Requirements).

#### SFPUC Facilities and Procedures

**Action haz1 (Phase 1)** Develop **hazardous chemical management procedures** addressing the type, use, storage, transport, and disposal of hazardous chemicals and pesticides used in watershed activities (e.g., SFPUC operations, nurseries, quarries, pest management, easements and leases, etc.). Guidelines include:

- A. Ensure proper material transport procedures (e.g., tie-down/attach material to vehicle).
- B. Carry appropriate spill response chemicals when transporting hazardous chemicals and pesticides.

**Action haz2 (Phase 2B)** Inventory and annually monitor all above- and below-ground **fuel storage tanks**, refueling stations, and vehicle maintenance yards within the watershed (e.g., Sunol Valley Golf Course, operations and maintenance yard, Sunol WTP, etc.) for control of vehicle-related contaminants and

*“Hazardous substances in the watershed are associated with SFPUC maintenance practices, public uses such as major roadways, and existing areas containing potential contaminants.”*

for compliance with applicable hazardous materials storage and handling requirements, as well as underground storage tank requirements.

**Action haz3 (Phase 2)** Identify and prioritize for removal from SFPUC lands, **dump sites** that pose a hazard to water quality or watershed resources. The program shall include:

- A. A thorough inventory of all existing dump sites and elements found within them.
- B. A plan to safely remove and dispose of the contents of each of the dumps.
- C. Strategies developed in conjunction with appropriate local agency(ies) to discourage future dumping on SFPUC lands, including signage, patrols, public notices, and fines.

**Action haz4 (Phase 1)** Conduct regular servicing for the SFPUC vehicle fleet and equipment so that leaks/drips/spills of **contaminants** are minimized. Guidelines include:

- A. Immediately report accidental spills of hazardous materials into surface waters to the Water Quality Bureau and the appropriate State agencies.
- B. Require that buckets and absorbent materials be carried in all SFPUC vehicles in case of an accident or breakdown in which vehicle-related fluids are released.
- C. Follow appropriate BMPs in Appendix C-6 to minimize leaching of vehicle-related contaminants into the soil or groundwater from facilities.

- D. For fire protection purposes, ensure that all vehicles and equipment are equipped with spark arrestors and each vehicle carries fire suppression equipment.

**Action haz5 (Phase 1)** Review and standardize SFPUC **boating practices**. Guidelines include:

- A. Standardize servicing, including inspection and maintenance schedules.
- B. Prohibit boat maintenance (e.g., refinishing or cleaning of hulls) within the watershed.
- C. Standardize refueling procedures to minimize the possibility of spills.
- D. Develop containment methods should a spill occur.
- E. Install air/fuel separators on air vents or tank stems of inboard fuel tanks on all boats to reduce amount of fuel spilled during refueling.
- F. Convert existing boat engines to cleaner burning four-stroke or fuel-injected engines.

**Spill Containment and Response**

**Action haz6 (Phase 1)** Identify **high-risk spill potential areas** and implement measures (e.g., fines, barricades, etc.) to reduce the risk of hazardous spills.

**Action haz7 (Phase 1)** Develop **spill response and containment measures** for SFPUC vehicles on the watershed. These measures should be coordinated with the overall Emergency Response Plan developed in Action saf7.

**Action haz7.1 (Phase 1)** Periodically assess the **adequacy** of the **hazardous materials spill clean-up** contractor to assure that all anticipated needs will be met in the event of a spill.

**Action haz7.2 (Phase 1)** Identify additional **hazardous materials clean-up supplies** and **equipment** that the LRMS should purchase. Guidelines include:

- A. Anticipate the likely size and type of hazardous materials spills that the LRMS would respond to on its own.
- B. Identify the appropriate types and amounts of supplies/equipment needed.
- C. Identify training and staffing needs to support operation of the additional clean-up equipment.

**Action haz8 (Phase 1)** **Train** staff members, as appropriate, in **spill response and containment** measures for SFPUC vehicles as well as for other types of spills on the watershed.

**Action haz9 (Phase 1)** Maintain a **network of hazardous materials clean-up storage lockers** at accessible locations on each reservoir and at areas where spill potential is high.

## **Coordination and Collaboration**

**Action haz10 (Phase A)** Require CalTrans to include **spill containment and diversion facilities** in new and upgraded facilities along I-680 and Route 84 to protect the secondary watershed as needed. Review adequacy of facilities per SFPUC's needs and policies.

**Action haz11 (Phase 1B)** Practice **interagency spill response** to isolate contaminants released in various reaches of the roadway. Assess adequacy and where needed, improve elapsed time between spill event, and notification of SFPUC staff.

**Action haz12 (Phase 1B)** **In coordination with Chevron, conduct ongoing monitoring** of the pipeline for potential hazards and assure that spill response measures are adequate.



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## 5.4 Waste - Human and Animal (was)

The presence and disposal of human and animal waste products within the watershed has a direct effect on water quality. The parasite *Cryptosporidium* is of the greatest concern on the Alameda Watershed; however, *giardia lamblia* and other pathogens also pose significant health risks.

The management actions for human and animal waste provided in this section are divided into the following topics:

- SFPUC Facilities and Procedures
- Lessees and Non-SFPUC Facilities
- Additional Surveys and Monitoring
- Coordination and Collaboration

Additional actions related to human and animal waste but more appropriately addressed in other sections include:

- minimizing and containing stormwater runoff, which is one of the primary methods for dispersion of waste products into the water system (Section 5.2: Stormwater);
- the management of cattle to maintain herd health and reduce the potential for pathogens to enter the water bodies (Section 5.22: Grazing Management); and
- requirements for adequate sanitary facilities in new development (Section 5.20: Design and Construction Requirements).

### SFPUC Facilities and Procedures

**Action was1 (Phase 2)** Inspect all SFPUC facilities to assess conditions of **vault, chemical, and composting toilets** and repair/replace as necessary. To minimize risk of contaminating water supplies, follow the guidelines below:

- A. Establish a frequent and regular service and inspection schedule.
- B. Require secondary containment for vaults or leak detection alarm (for example, bolt chemical toilets to foundation and install berm to catch spills).
- C. Verify that there are adequate numbers of chemical or composting toilets.
- D. Coordinate with EBRPD to inspect EBRPD facilities on lands leased from the SFPUC.

### Lessees and Non-SFPUC Facilities

**Action was2 (Phase 2)** Inspect sanitation and waste treatment systems at **Sunol Valley Golf Course** to assess condition, performance, and impacts on surface and groundwater quality. Implement the following guidelines:

- A. Stipulate maintenance/repair/replacement schedule in lease provisions.

*“The parasite Cryptosporidium is of the greatest concern on the Alameda Watershed.”*

- B. Reduce risk associated with chemical toilets by requiring bolting to foundation and installation of berm or other secondary containment. Vaults should include secondary containment/alarm system. Implement BMPs if needed.
- C. Conduct ongoing monitoring to detect surface water degradation. Include groundwater monitoring under the following conditions: if adequate wells are available to reduce sampling costs, if there is evidence of surface water contamination, or in the event that other concerns appear.

**Additional Surveys and Monitoring**

**Action was3 (Phase 3)** Conduct monitoring in areas where wildlife concentrate (e.g., bats, birds, etc.) to assess the contribution of **wildlife excrement** to water quality degradation. If necessary, develop a management strategy to mini-

mize this situation consistent with protection of the water quality.

**Coordination and Collaboration**

**Action was4 (Phase A)** Consult with Alameda and Santa Clara Counties regarding **new residential development** within the greater hydrologic watershed to provide appropriate guidance related to on-site waste disposal systems and encourage the following:

- A. Export waste outside of the watershed.
- B. Routine systems inspection and performance testing.
- C. Construction of upgrades such as leak alarms and secondary containment berms, if necessary.
- D. Use of BMPs, including a schedule of system care and pumping frequency, inspection schedule and procedures, and disposal options.
- E. Conduct ongoing monitoring to detect impacts on reservoir.



## 5.5 Roads (roa)

Paved and unpaved roads on the watershed are natural receptacles of by-products such as motor oil, gasoline, refuse, and residue from exhaust emissions. The dense nature of the roadway surfaces (whether paved or not) accelerates the rate of stormwater flow, which has the potential to increase erosion and transports these by-products of motor vehicle operation into the water supply, thereby jeopardizing water quality. In addition, the major thoroughfares (such as I-680) typically function as transportation corridors for trucks carrying hazardous cargo. The transfer of hazardous cargo through the watershed introduces the risk of spill, which further increases the threat to water quality.

The management actions for roads provided in this section are divided in the following topics:

- Assessment and Management of Existing Roads
- New Roads

Additional actions related to roads but more appropriately addressed in other sections include:

- stormwater runoff control measures (Section 5.2: Stormwater);
- erosion control measures (Section 5.9: Vegetation, Soil, and Pest Management);
- emergency response procedures for hazardous roadway spills (Section 5.3: Hazardous Materials and Con-

taminants and Section 5.8: Safety and Security); and

- fire defense improvement requirements (Section 5.7: Fire Management).

For additional detail on relevant BMPs, refer to Appendix C-6.

### Assessment and Management of Existing Roads

**Action roa1 (Phase 1)** Evaluate, rank the importance of, and implement **modifications to the existing road system** to reduce erosion and sedimentation, and achieve the “least” road (modify length and width) to meet projected needs. Guidelines for the evaluation include:

- A. Evaluate the need for the road.
- B. Identify present and future level and type of use.
- C. Inventory physical characteristics.
- D. Evaluate historical performance.
- E. Determine ownership/responsibility.
- F. Follow BMPs for evaluation guidelines.

**Action roa2 (Phase 1) Relocate** existing necessary **high use roads**/road segments in proximity to streams (i.e., within 150 feet) that are the primary source of excessive erosion and sedimentation, wherever possible.



*Watershed Internal Road*

*“Roads are natural receptacles of by-products such as motor oil, gasoline, refuse, and residue from exhaust emissions. Roadway surfaces accelerate the rate of stormwater flow, which increases the potential for erosion.”*

**Action roa3 (Phase 1) Modify** the grading and drainage of existing necessary **high use roads**/road segments to reduce the potential for excessive erosion and sedimentation. Guidelines for these modifications include:

- A. Convert non-sloped roads to sloped roads.
- B. Reduce the use of inside ditch lines and culverts by installing rolling dips at intervals dictated by terrain and road angle.
- C. Improve the performance of remaining ditches and culverts by adding flared inlets and permanent erosion protection at the culvert outfalls. Prohibit improper culvert installation practices such as shotgun culvert outfalls, culverts without energy dissipaters, improperly sized culverts, etc.
- D. Ensure that stream crossings have the hydraulic capacity to safely handle the expected storm frequency for lifespan of crossing.
- E. Modify or replace culverts with inadequate capacity or alignment.
- F. Establish artificial toe mass for slumps and slides.

**Action roa4 (Phase 1) Close and retire (regrade, revegetate, restore) roads** that are not needed for safety or access and eliminate or minimize problem erosion points by installing culverts and waterbars, or otherwise stabilizing the roadway.

**Action roa5 (Phase 2) Reduce the need for multiple** maintenance access roads

on infrastructure easements by consolidation.

**Action roa6 (Phase 2A) Inspect and manage unpaved roads**, appurtenant stormwater collection systems, unlined stormwater conveyance systems, and other stormwater facilities according to applicable sections of the California Forest Practices Act Rules (also see Action sto1). Guidelines include:

- A. Remediate and stabilize areas experiencing significant erosion (e.g., road cuts and stream crossings).
- B. Regrade unpaved roads to minimize erosion.

**Action roa7 (Phase 1B) Maintain fire roads** to minimize sediment generation through effective installation of waterbars, avoidance of unnecessary grading, and paving short lengths of road where needed.

**Action roa8 (Phase 2) Restrict access on low use roads** with sensitive soil types and emergent water features (e.g., emergency access only) by gates or barriers, allow revegetation by scarifying the road surface and planting grass seed, and use mowing as the road maintenance, or at a minimum provide water bars or broad dips.

**Action roa9 (Phase 2B) Periodically inspect closed roads** to ensure vegetation stabilization and drainage measures are operating as planned, and conduct re-seeding and drainage maintenance as needed.

**Action roa10 (Phase 2B)** Conduct **annual inspections and repairs**, as necessary, to reshape roads to conserve existing material, retain the design cross section, and prevent or remove irregularities that retard normal surface runoff; clear road inlets and outlet ditches, catch basins, culverts, and other stream-crossing structures of obstructions prior to the onset of the wet season.

**Action roa11 (Phase A)** Monitor road conditions during **heavy use periods** and/or unfavorable weather conditions; limit use on the basis of road condition when necessary to prevent excessive erosion or sedimentation, and close roads seasonally if conditions warrant.

### **New Roads**

**Action roa12 (Phase A)** Design, site, and construct **new roads and trails** following specific guidelines and BMPs for road location and alignment (slope position, distance from stream, stream crossings), design (gradient, width, drainage, etc.), and construction proce-

dures appropriate for wildland conditions. Specific practices should be drawn from the California Forest Practices Act; guidelines include:

- A. Avoid streams, riparian areas, and unstable slopes.
- B. Minimize the number of stream crossings.
- C. Locate required crossings at a right angle to streams.
- D. Select appropriate crossing types.
- E. Provide drainage that removes water before it becomes concentrated.
- F. Minimize grading.
- G. Bridges and culverts should be adequately sized and properly aligned; fords should only be used where the bed has a firm rock or gravel bottom, where approaches are low and stable, and where fish or other sensitive aquatic resources are not present during low flows.
- H. Locate and design new roads and trails to follow natural topography, minimize steep slopes and stream crossings, avoid large cut and fill road designs, minimize excavation, and avoid highly erodible areas.



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## 5.6 Conservation and Reclamation of Water (con)

Employing water conservation practices and using raw or reclaimed water for on-site needs help to increase the quantity of water available for SFPUC customers. This section addresses the most plausible opportunities to implement these practices, including the use of raw or reclaimed water for irrigation and fire suppression activities and enhancing aquifer recharge zones.

Actions related to water conservation and reclamation but more appropriately addressed in other sections include:

- actions requiring new lessees and permittees to conserve water (Section 5.15: Lease and Permit Requirements); and
- actions related to the creation of water storage reservoirs in quarry pits (Section 5.21: Sunol Valley).

**Action con1 (Phase 1B)** Periodically evaluate **landscaping and irrigation practices** for water efficiency and where necessary implement water conservation techniques. Guidelines include:

- Revegetate using native and/or drought-tolerant species.
- Customize irrigation techniques per plant species.

**Action con2 (Phase 1)** Evaluate the feasibility of, and implement where possible, the **use of raw untreated water or reclaimed water** for uses such as roadways, irrigation of SFPUC and EBRPD facilities and grounds, sanitation facilities, fire suppression, other landscape irrigation needs, and during construction or earth-moving activities within the watershed. Continue to use raw, untreated, or reclaimed water at the Sunol Valley Golf Course. 



*Sunol Water Treatment Plant*

*“Employing water conservation practices and using raw or reclaimed water for on-site needs increase the quantity of water available for SFPUC customers.”*

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## 5.7 Fire Management (fir)

Fire events on the watershed pose a direct threat to water quality and quantity due to the resultant increase in erosion, siltation, and nutrient loading and the potential introduction of chemicals used to suppress fires. The climate of the watershed is characterized by long, dry, hot summers which promote the potential for ignition. Fire events also pose hazards to persons and property. In particular, the grasslands and sloping terrain of the watershed increase the likelihood of fire, as grass is easily ignited and slopes cause fire to move more rapidly. However, approximately three-fourths of the Alameda Watershed is used for cattle grazing, which reduces the grassy fuels somewhat. To address the issue of fire management, the Alameda Fire Management Element (Fire Element) was prepared as part of the watershed planning process. It is provided in its entirety in Appendix A-1.

The Fire Element evaluated fire hazard on the Alameda Watershed using the following three methods: (1) the hazard (or more specifically, the severity) was mapped in accordance with rules defined under the California Wildfire Severity Law AB 337; (2) static fire behavior predictions were run using BEHAVE - a computerized fuel and fire behavior prediction model developed by the U.S. Forest Service (USFS); and (3) fire spread and growth potential were evaluated using FARSITE - a computer

program developed by the NPS and used by both the NPS and USFS.

The Fire Element presents an integrated approach to fire management which considers impacts to water quality, water supply, and ecological resources and protection of persons and property. It designates specific areas in need of fire management, identifies recommended management techniques for these areas, and provides a day-to-day operations and maintenance plan for fire-related activities. In so doing, the Fire Element is divided into four sub-elements: Fire Defense Improvement, Fuel Management, Fire Response, and Monitoring.

The actions presented below were derived from the Fire Element, are organized by each of the sub-elements, and focus on the broad actions set forth in the Element. The reader is encouraged to refer to the sub-elements of the Fire Management Element in Appendix A-1 for detailed descriptions of each action, as well as recommended techniques and standards.

The management actions for fire management provided in this section are divided into the following topics:

- Fire Pre-Suppression
- Fire Defense Improvement
- Fuel Management
- Fire Response



*Watershed Grasslands*

- Fire Management Plan Implementation
- Monitoring

Additional actions related to fire management but more appropriately addressed in other sections include:

- actions related to fire road maintenance and new roads (Section 5.5: Roads);
- actions related to emergency response plans and procedures (Section 5.8: Safety and Security);
- actions associated with the Vegetation Management Plan and also with reducing soil erosion (Section 5.9: Vegetation, Soil, and Pest Management);
- appropriate herbicides and use procedures for vegetation management (Section 5.9: Vegetation, Soil, and Pest Management);
- actions related to fire-related training (Section 5.17: Staffing and Training); and
- actions related to fire prevention equipment for SFPUC vehicles (Section 5.3: Hazardous Materials and Contaminants).

### Fire Pre-Suppression

**Action fir1 (Phase 1)** Prior to authorizing the use of any vehicle or equipment on the watershed, require that SFPUC **vehicle/equipment comply with the fire prevention regulations** established by CDF for use in the watershed. Non-SFPUC equipment must be certified by CDF. All vehicles/equipment shall include:

- spark arrestors
- carry fire suppression equipment during fire season.

### Fire Defense Improvement

**Action fir2 (Phase 1)** Install a total of nine **dry hydrants** into reservoirs or other water sources to reduce the complexity of long-distance water shuttle operations. The dry hydrants shall be installed at the following locations:

- Intersection of Sections 28, 29, 32, and 33 on Arroyo Hondo.
- Section 30 south of the eastern arm of the Calaveras Reservoir on the access road.
- Near Goldfish Pond, where Calaveras Road enters SFPUC land from the southwest.
- In the western half of Section 18 near Ridge Road.
- In Section 17 near the Diversion Dam.
- Along La Costa Creek south of the Hetch Hetchy Aqueduct east of BM 929.
- Along the dirt road that connects Indian and Apperson Creeks south of San Antonio Reservoir.
- At the Cottage at the spillway of San Antonio Reservoir.
- East of Calaveras Road, in the first drainage north of Hetch Hetchy Aqueduct at approximately 900 feet elevation.

**Action fir3 (Phase 1)** Install and maintain a total of **four helispots** on SFPUC property at the locations listed below.

The helispots shall include a paved area with a catchment system with asphalt berms, and a water collection basin or tank capable of holding approximately 10,000 gallons from which water can be drafted.

- A. In Section 27 on Weller Road at 1,800 feet elevation (adjacent to the access road).
- B. In Section 10 east of Mission Peak on the access road to southern fork of Mill Creek Road at 680 feet elevation (adjacent to the access road).
- C. In Section 23 in Williams Gulch on the access road as I-680 enters and leaves the SFPUC northeastern boundary at 2,000 feet elevation (adjacent to the access road).
- D. In Section 27 west of Arroyo Hondo on Hades Ridge at BM 3117.

**Action fir4 (Phase1)** Working with adjacent landowners, **install** three additional **helispots off of SFPUC lands** at the following locations:

- A. In Section 11, on Valpe Ridge on Rose Peak, VABM 3817.
- B. In Section 2, on Wauhab Ridge, at a local peak of 3,223 feet elevation.
- C. In Section 6 (off SFPUC lands) on EBRPD lands on the southern fork of Welsh Creek Road at a local peak of 2,030 feet elevation (adjacent to an access road).

**Action fir5 (Phase1)** Working with adjacent landowners, **install** an additional four **dry hydrants off of SFPUC lands** at the following locations:

- A. Section 3 near the southern intersection of Geary Road and Calaveras Road.
- B. At the Calaveras Test Site.
- C. At the northeast border of SFPUC lands along Vallecitos Road northwest of the Chevron facility.
- D. Where the jeep trail and Sunol Aqueduct intersect north of the Sunol Valley Golf Course

**Action fir6 (Phase 1)** **Install** one 10,000-gallon **water tank** and a supporting water collection system, and one hydrant (to be co-located) in the southwest corner of Section 3 where the jeep trail runs up to Poverty Ridge.

**Action fir7 (Phase 1)** **Identify and construct necessary road improvements** including turnouts, turnarounds, and safety zones as topography and soil characteristics permit (exact location to be determined in the field) to provide better access to enhance fire suppression capabilities.

**Fuel Management**

**Action fir8 (Phase 1B)** Complete the **fuel management projects** listed below, in coordination with applicable agencies, to reduce fuels on the watershed. In implementing these projects, adhere to the Fuel Management Standards, Guidelines and Fuel Management Methods Available (e.g., hand labor, tree removal, mechanical treatments, prescribed burning, grazing, and chemical treatments coordinated with the SFPUC

*“Fire events on the watershed pose a direct threat to water quality and quantity due to the resultant increase in erosion, siltation, and nutrient loading and the potential introduction of chemicals used to suppress fires.”*

IPM Plan) set forth in the Fire Management Element (Appendix A-1). A complete description of the fuel management projects as well as the recommended treatment and schedule is also included in the Fire Management Element.

- **Project 1 - Niles Canyon**  
 Treatment Goal: Limit fire spread to off-site lands.  
 Recommendations: Prune trees, mow grass, and work with neighbors to include off-site lands in treatments.
- **Project 2 - Calaveras Creek**  
 Treatment Goal: Limit fire spread to off-site lands.  
 Recommendations: Prune trees, remove understory, mow/disk grass, and conduct prescribed burn of woodland every 7 to 10 years.
- **Project 3 - Poverty Ridge**  
 Treatment Goal: Ease containment, reduce potential sedimentation, and increase infiltration.  
 Recommendations: Establish Coordinated Resource Management Program (CRMP) with neighboring land owners, install control lines where necessary, conduct prescribed burn of woodland every 7 to 10 years, and conduct prescribed burn of scrub every five years (or if chaparral, every 15 to 20 years).
- **Project 4 - Williams Gulch**  
 Treatment Goal: Increase infiltration with increased grass cover and

prevent sedimentation into reservoirs.

Recommendations: Develop CRMP with neighbor, install control lines where necessary, conduct prescribed burn of scrub every 10 to 15 years, and conduct prescribed burn of chaparral every 15 to 25 years.

- **Project 5 - Alameda Creek**  
 Treatment Goal: Minimize roadside ignition and fire spread.  
 Recommendations: Prune trees, remove understory, roadside mowing/disking, and conduct prescribed burn of woodland every 7 to 10 years or graze small portion with goats each year.
- **Project 6 - Below Sheridan Road**  
 Treatment Goals: Limit fire spread to off-site lands.  
 Recommendations: Prune trees, remove understory, install control lines where necessary, mow grass, and conduct prescribed burn of woodland every 7 to 10 years.
- **Project 7 - Prescribed Fire Above Calaveras Road**  
 Treatment Goal: Limit fire spread to off-site lands and increase infiltration.  
 Recommendations: Install control lines where necessary and conduct prescribed burn of each of four parcels every 7 to 10 years.
- **Project 8 - Exclusion Burns**

Treatment Goal: Limit fire spread to off-site lands, increase filtration, and halt succession into north coastal scrub fuels, to remove thatch to promote more healthy native grass stands.

Recommendations: Install control lines where necessary and conduct prescribed burn in each of four parcels every 5 to 7 years.

- Project 9 - Roadside Disking  
Treatment Goal: Minimize ignitions and limit fire spread with SFPUC lands and to off-site lands.  
Recommendations: Prune trees and mow/disk grass.
- Project 10 - Clearance Around Structures  
Treatment Goal: Reduce structural damage from a wildfire, reduce ignitions, and prevent spread of structural fire.  
Recommendations: Comply with defensible space guidelines.
- Project 11 - Grazing Leases  
Treatment Goal: Limit ignition, slow fire spread, and reduce fire intensity which could damage resources and increase sedimentation.  
Recommendations: Locate features which attract cattle near high risk areas and comply with range management plan.
- Project 12 - Power Line Clearing  
Treatment Goal: Prevent ignition from power lines.

Recommendations: Remove hazardous trees, remove trees which can blow across power lines, conduct annual inspection and remedial tree removal, and inspect power lines and poles after significant storms.

- Project 13 - Treefall Removal  
Treatment Goal: Remove heavy fuels to reduce damage to remaining adjacent trees.  
Recommendations: Remove hazardous trees and annual inspection and remedial tree removal.

**Fire Response**

**Action fir9 (Phase A)** Watershed staff shall **report and provide preliminary assessment** of all fires to Division Dispatch. Division Dispatch will in turn call 911 and notify the watershed manager.

**Action fir10 (Phase A)** Following assessment and reporting of the fire, **initial response** shall be made if the fire appears to be easily suppressed. If the fire is already large or is quickly gaining intensity beyond the capability of limited water and suppression ability, then evacuate and report situation and staff location to watershed dispatch.

**Action fir11 (Phase A)** If an **evacuation** is necessary, contact the Alameda and Santa Clara County Sheriff Departments, the Office of Emergency Services (OES), EBRPD, and CDF. Have the dispatcher notify SFPUC employees; and

set up an incident command (IC) system and liaison with other agencies.

**Action fir12 (Phase 1)** Prepare and provide to affected agencies and organizations **maps and information** that depict and explain items such as special requirements within the watershed to protect water quality, safe zones, turnout locations, locations of wet and dry hydrants, helispots/heliports, fuel break locations, natural barriers, evacuation routes, and areas of limited or modified suppression. Affected agencies and organizations include but are not limited to:

- A. East Bay Regional Park District.
- B. Spring Valley Structural Fire Department.
- C. Alameda County Fire Department.
- D. Lawrence Livermore National Laboratory.
- E. Central Fire Department.
- F. Milpitas Fire Department.
- G. Smith Creek CDF Stations.

### **Fire Management Plan Implementation**

**Action fir13 (Phase 1)** Assign the **duties of implementation of the Fire Management Plan** and incident commander to an existing or new **LRMS staff member**.

### **Monitoring**

**Action fir14 (Phase 2)** Establish **permanent transects** and vegetation plots in treatment and control areas, and measure suitable vegetation indices and physical characteristics over a five-year period to determine effects of vegetation treatments. Guidelines include:

- A. Monitoring should be done in a manner consistent with other land management agencies to obtain comparable data. Use comparable data to effectively increase sample size or to reduce demand by monitoring on staff.
- B. Appropriate personnel should obtain training regarding monitoring procedures and expected program results.
- C. Conduct ongoing monitoring in accordance with the monitoring plan set forth in the National Park Service Western Regional Fire Monitoring Handbook, 1992.



## 5.8 Safety and Security (saf)

Safety and security, as used in this context, relate primarily to human health and safety. Natural and human-induced events within the watershed that could potentially affect health and safety include: seismic events, flooding, fire, pipeline damage, toxic spills, and hazardous conditions along trails. The actions listed below identify ways the SFPUC can minimize the occurrence of such events, and if such an event should occur, set up systems for SFPUC staff to quickly and effectively respond. The actions listed below cover a range of issues (e.g., regular maintenance activities, emergency response, etc.); however, there are actions presented in other sections of this chapter which are related and should therefore be reviewed in conjunction with those listed below.

The management actions for safety and security provided in this section are divided into the following topics:

- Law Enforcement
- Safety and Security Program
- Watershed Reservoir Patrol
- Watershed Manual
- Coordination and Collaboration

Additional actions related to safety and security but more appropriately addressed in other sections include:

- fire response procedures (Section 5.7: Fire Management);
- pesticide use safety guidelines (Section 5.9: Vegetation, Soil, and Pest Management);

- required emergency response plans for all lessees (Section 5.15: Lease and Permit Requirements); and
- law enforcement training (Section 5.17: Staffing and Training).

### Law Enforcement

**Action saf1 (Phase 1)** Develop **law enforcement procedures** for SFPUC and LRMS staff.

### Safety and Security Program

**Action saf2 (Phase 1)** Develop and implement an LRMS **safety and security program** that includes regular maintenance and inspection procedures for areas used by the public; trespassing control; law enforcement responsibilities; on-site risk assessment studies; a system for accident reporting; employee training; watershed fencing inspections and repair procedures; emergency response plan and drills; and allows for periodic program evaluation and updating, as necessary.

**Action saf3 (Phase 1)** Designate and train an LRMS **safety coordinator**, in coordination with BP&T's Health and Safety staff, whose responsibilities shall include overseeing the implementation, evaluation, and monitoring requirements of the program, as well as training employees in safety and emergency response procedures (also refer to Action sta11).



*San Antonio Reservoir*

**Action saf4 (Phase 1)** Regularly **inspect and maintain the facilities and areas used by the public** and assign responsibilities for maintenance of these facilities to the appropriate agency. The following describes some of the most common types of safety concerns to be considered related to facilities used by the public.

- A. Vegetation Clearing And Management: Hazardous trees, overhanging limbs and weedy growth obstructing views and/or creating hazardous conditions, poisonous vegetation near trail, debris on trail surface.
- B. Streams: Eroding streambanks near trail, drainage pipes clogged with debris causing stream overwash.
- C. Roadway Crossings: Caution signs not located on trail and roadway, pavement markings for crossing inadequate, inadequate sightlines.
- D. Trail Tread Surfaces: Hard-surfaced pavement cracked and uneven, soft surface tread rutted, weedy vegetation encroaching into tread, standing water and mud in tread.
- E. Trail Bridges: Handrails loose; bridge decking warped, loose, or missing; bridge footings exposed from erosion; rotting structural timbers; approach rails missing.
- F. Roadway Underpasses/Overpasses: Tread surface wet or full of litter and debris, lighting systems inoperable, light bulbs burned out, fencing inadequate to protect users.
- G. Safety Railings: Not located in areas of need, post and footings loose, handrails missing, rotting timber, corroded steel, not long enough, not high enough for all users.
- H. Boardwalks: Handrails missing; rotting timber; bench seating vandalized; post and footings loose or sinking; decking warped, loose, or missing.
- I. Signage Systems: Regulatory and warning signs missing or improperly located, information signs vandalized or missing, sign posts corroded or rotting, signs vandalized.
- J. Lighting Systems: Bulbs burned out; fixtures broken or vandalized; support pole/structure damaged; electrical wiring exposed, damaged, or cut; ballast inoperable.
- K. Drinking Water Systems: Water not potable, spigot clogged, spigot switch inoperable, basin drain clogged, water pressure inadequate, standing water around fountain.
- L. Solid Waste Disposal: Trash receptacles overflowing, vandalized, or damaged; litter and debris discarded throughout the area; illegal dumping occurring.
- M. Sanitary Sewer System: Toilets clogged or inoperable, sanitary main inoperable, port-a-potty leaks, clean-outs damaged or inoperable, stalls and building vandalized, sinks clogged, standing water.
- N. User Conduct: Cyclists and roller-skaters/bladers riding too fast, horses using pedestrian tread, motorized users accessing trail or area, dogs (other than for the visually im-

paired) on trails, after hours partying, alcohol consumption.

- O. **Public Parking:** Pavement surface littered with broken glass and debris, parking spaces not well defined, inadequate signage, handicap spaces not provided or inadequate.
- P. **Erosion Control Structures on Trails:** Ensure proper function.
- Q. **Public Toilets:** Need for cleaning and pumping.

**Action saf5 (Phase 1B)** As part of the Safety and Security Program, conduct regular, **on-site risk assessment inspections** of SFPUC watershed facilities. Guidelines for on-site inspections include:

- A. Make a record of the inspections, noting where potentially hazardous situations occur, what type of hazard exists, and what user group is most likely at risk.
- B. Determine the likelihood of an accident occurring at the identified hazard, relative to the amount or intensity of use or as a result of ineffective or poor design.
- C. After identifying the problem area and determining the likelihood of an accident, management options include selecting one of the following four options:
  - 1. **Risk avoidance:** Prohibit use of the potentially dangerous area and reroute use until the areas or facility is repaired.
  - 2. **Risk reduction:** Repair the problem area immediately, in-

crease maintenance to the problem area, limit the intensity of use in a specific area, or post warning signs notifying users of the problem area.

- 3. **Risk retention:** Require and obtain risk waivers from all watershed users.
- 4. **Risk transfer:** Transfer the risk to the user by requiring the user to obtain necessary insurance prior to using the watershed.

**Action saf6 (Phase 1B)** Periodically and systematically **inspect** watershed perimeter **fencing, access gates, and locks** and repair/replace as required to minimize trespassing, straying cattle, illegal dumping, etc.

**Action saf7 (Phase 1B)** Develop and periodically revise an **Emergency Response Plan** which includes procedures for the following types of emergency situations:

- A. Toxic spills and leaks.
- B. Gas and water pipeline damage.
- C. Damaged electric transmission and distribution lines.
- D. Fire.
- E. Flooding/inundation.
- F. Geologic and soil-related disturbances.
- G. Human injury incidents/accidents.

Guidelines for emergency response procedures include:

- A. Assess adequacy of elapsed time between emergency occurrence and notification of SFPUC staff.

*“Natural and human-induced events within the watershed that could potentially affect health and safety include: seismic events, flooding, fire, pipeline damage, toxic spills, and hazardous conditions along trails.”*

- B. Coordinate emergency response with non-SFPUC agencies (e.g., Alameda and Santa Clara Counties, OES).
- C. Collect information on all accidents that occur on the watershed, including type of injury, date, time, location, conditions, and activity, as well as injured party (e.g., SFPUC employee or recreationist, scientist, etc.).
- D. Evaluate all accidents to determine areas which may require modifications for safety reasons.

**Action saf8 (Phase 1B)** Periodically conduct **emergency response practice drills** for the seven types of emergency situations (see Action saf7). Guidelines include:

- A. Assessment of response time.
- B. Coordination of practice drills with non-SFPUC agencies.
- C. Evaluation of drill to identify areas for improvement.

**Action saf9 (Phase 1B)** Periodically evaluate and update the **safety and security program**, as necessary.

**Watershed Reservoir Patrol**

**Action saf10 (Phase 1B)** Conduct **daily boat patrols** of San Antonio and Calaveras Reservoirs to assess water quality emergencies, trespassing problems, or other emergency situations.

**Action saf11 (Phase 1B)** Maintain two **LRMS patrol boats**, one on each reservoir (Calaveras and San Antonio), for ongoing patrols and emergencies.

**Watershed Manual**

**Action saf12 (Phase 1B)** Develop, publish, and periodically update a **Watershed Manual** that addresses SFPUC operations and maintenance procedures, emergency response procedures, and the safety and security program. The manual shall be distributed to all applicable SFPUC personnel, contractors, and others as needed. The manual shall include, but not be limited to:

- A. The names, phone numbers, and the chain of command for responsible entities/persons in charge of carrying out the applicable watershed management activities, as well as the agencies responsible for law enforcement, fire protection and medical emergencies.
- B. A description of SFPUC operations and maintenance procedures.
- C. A list of public use rules and regulations.
- D. Emergency response procedures for the following seven emergency situations:
  1. Toxic spills and leaks.
  2. Pipeline damage.
  3. Damaged transmission and power lines.
  4. Fire.
  5. Flooding/inundation.
  6. Geologic and soil-related disturbances (earthquakes, slides).

- 7. Human injury incidents/accidents.
- E. Response procedures for non-emergency situations (e.g., illegal dumping, downed trees, dead animals, etc.).
- F. A set of maps of the watershed.

**Coordination and Collaboration**

**Action saf13 (Phase 2)** Work with CalTrans and Alameda and Santa Clara Counties to **install signs, emergency call boxes, and emergency response telephone numbers** on I-680, Route 84, and Calaveras Road about risk of fires, vehicle accidents, and risk of spills.

**Action saf14 (Phase 1B)** Coordinate with the Alameda and Santa Clara Counties’ Sheriff and Fire Departments to develop and periodically update an **evacuation plan** for use during floods, earthquakes, fires, or other natural disasters.

**Action saf15 (Phase 1)** Review utility emergency response plans for adequate non-SFPUC **pipeline failure procedures** in event of earthquake, landslide, or other disaster. Emergency response teams should:

- A. Receive adequate notification time (the elapsed time between time of incident and time SFPUC is noti-

fied) to protect water supplies, and have a response plan which addresses how to protect the watershed from pipeline failures.

- B. Facilitate coordination between pipeline owner, LRMS staff (to secure water supply), and emergency response teams.
- C. Practice emergency response scenarios on various reaches of pipe with all participating agencies, and assess adequacy of the containment facilities.
- D. Mark the pipeline alignment with signs at more frequent intervals.
- E. Contact necessary numbers before digging, as well as emergency response telephone numbers.
- F. Incorporate any BMPs and changes which specify emergency response into pipeline leases.

**Action saf16 (Phase 1A) Coordinate with the EBRPD** in maintaining and enforcing the safety and security program for areas of the watershed where public access and use are allowed to occur.

**Action saf17 (Phase 1)** Coordinate with Alameda and Santa Clara Counties, and EBRPD to develop a **schedule of fines and penalties** for watershed infractions.



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## 5.9 Vegetation, Soil, and Pest Management (veg)

The watershed functions as an important biological reserve in a region quickly becoming dominated by urban development. Located in the central portion of the Diablo Range in Alameda and Santa Clara Counties, the watershed and its associated reservoirs provide a diversity of natural community/cover types. The west-facing slopes in the vicinity of the Calaveras Reservoir are predominantly covered with grasslands, while the north and east-facing slopes are covered with oak woodland and brush in the drier locations. Grasslands, with small areas of brush and woodland, dominate the landscape surrounding San Antonio Reservoir. Riparian woodland occurs in the more lush areas along San Antonio Creek. Management of the vegetation communities and soil resources is critical to the watershed's long-term ecological viability and maintenance of water quality and supply.

Closely related to vegetation and soil management is IPM. Watershed pests include a wide range of plants and animals including: invasive shrubs in brushland areas; weeds along roadsides; gophers and weeds on the Sunol Valley Golf Course; algae and floating plants in the reservoirs; feral pigs, cats, and dogs; insects; and introduced bullfrogs and largemouth bass in aquatic habitats. Each pest, and attempts to control

them, have varying impacts on the watershed.

SFPUC operations, maintenance, and construction activities and/or use of watershed land by the public have the potential to adversely affect vegetation and soil resources and disturb the ecological balance within the watershed. The actions listed below articulate the management strategies related to vegetation, soil preservation, and integrated pest management.

The management actions for vegetation, soil, and pest management provided in this section are divided into the following topics:

- Vegetation Management Plan
- Assessment Prior to New Activities
- Restoration
- Exotic Species
- Soils Management
- Integrated Pest Management
- Coordination and Collaboration

Additional actions related to vegetation and soil resources and pest management but more appropriately addressed in other sections include:

- fire management actions to reduce fuel build-up and protect sensitive vegetation (Section 5.7: Fire Management);
- protection and creation of vegetation for wildlife use (Section 5.10: Wildlife);



*Sycamore Alluvial Woodland*

- staff training regarding sensitive species (Section 5.17: Staffing and Training);
- actions related to maintaining an up-to-date watershed GIS database (Section 5.19: Information Management); and
- actions related to grazing, vegetative cover protection, and avoidance of erosion (Section 5.22: Grazing Management).

For additional detail on relevant BMPs, refer to Appendix C-6.

**Vegetation Management Plan**

**Action veg1 (Phase 2)** Prepare and implement a **Vegetation Management Plan** which is coordinated with the recommendations set forth in the Fire Management and Grazing Resources Management Elements and special status plant protection (see Appendix A-1 and A-2, respectively). The Vegetation Management Plan shall achieve the following:

- A. Develop clearly articulated vegetation management objectives based on the Vegetation Policies set forth in Chapter 4 for geographic areas (“units”) on the watershed with substantially uniform conditions of slope, soil, exposure, initial vegetation type, and desired future condition.
- B. Identify a long-range, recurring set of unit management prescriptions to attain and maintain these objectives. These prescriptions shall

be the principal implementing mechanism of the Vegetation Management Plan. The management prescriptions shall define the desired future condition for each unit and how it shall be achieved and maintained in perpetuity. The desired future condition and prescriptions may also require coordination with other management concerns such as water yield, fire hazard reduction, wildlife habitat, or grazing.

- C. Design and map units using a global positioning system (GPS) as practicable management units. They may be any size, shape, or location but should have convenient administrative boundaries. For example, if understory burning is prescribed for a unit, it should be large enough for a burn to be cost-effective, and be defined by roads or fuelbreaks where the fire would logically be contained.
- D. Establish permanent transects and vegetation plots in treatment and control areas, and measure suitable vegetation indices and physical characteristics over a five-year period to determine effects of vegetation treatments. This monitoring should be done in accordance with the guidelines set forth in the BMP appendix (C-6) and done in a manner consistent with other land management agencies to obtain comparable data. Use comparable data to effectively increase sample size or reduce demand by monitoring on staff. Train appropriate per-

sonnel regarding monitoring procedures and expected program results.

- E. Institute a computerized record-keeping system using GIS and supporting database programs and GPS to track vegetation management activities, including unit condition, history (e.g., last treatment date and type), and next date for subsequent monitoring and treatment. Create a supporting database of Stand Record Cards to contain the following information: geographic location (in map and text description); initial condition (e.g., fuel loading, species composition, disease incidence, percent dead, snag densities); unit prescription; desired future condition; and next scheduled treatment. Maintain Stand Record Cards at SFPUC headquarters with a system that automatically brings a unit to the attention of managers when treatments are due (e.g., understory clearing, herbicide treatment, road maintenance, growth and survival monitoring in plantations, etc.).

Guidelines to consider when developing the Vegetation Management Plan include:

- A. Follow species and habitat protection requirements specified in multi-species Habitat Conservation Plan (HCP) (Action wil9) for vegetation management.
- B. Consider the autecology (reproductive strategies) of sensitive plant species when selecting the type and timing of vegetation management technique.

- C. Ensure that vegetation management prescriptions take into account habitat use by legally protected species in shrub communities.
- D. Conduct prescribed burns under conditions that do not harm obligate seeding species.
- E. Screen and restore disturbed areas with an appropriate mix of native vegetation species.
- F. Encourage analysis of complex biotic interactions such as mycorrhizal associations, pollination systems, dispersal systems, herbivory, and predation.
- G. Investigate and apply where possible IPM techniques for controlling roadside vegetation including flame control, re-seeding with native grasses, and use of hot water or steam and mowing in preference to spraying of chemical herbicides.
- H. Conduct surveys for known and potential special status species habitat prior to initial fuel treatments, and impose appropriate geographical or seasonal restrictions to ensure that the species and their habitat are protected from significant irreversible damage.
- I. Use construction of fuelbreaks as a venue for mechanical reintroduction of native perennial grasses.
- J. Develop and manage fuelbreaks for the benefit of vegetation communities. Guidelines include:
  - 1. Create fuelbreaks with blended or feathered edges through selective thinning and by cutting

*“The watershed functions as an important biological reserve in a region quickly becoming dominated by urban development.”*

indentations in brush to create “bays.”

2. Interior areas of the fuelbreaks should retain clumps of unmodified vegetation to provide cover and food for wildlife and create interest and variety in the landscape.
  3. Implement fuelbreak conversion to perennial grasses in clay loam soils (e.g., Fagan or Felton variant) where water storage capacity is 2 to 3 inches in the upper 3 feet.
  4. Manage all fuelbreak edges to maximize linear edge (minimum 2:1 ratio of edge length to centerline) and maintain a shrub zone between trees and open areas.
- K. Maintain vegetation adjacent to all facilities to create a defensible space on all sides.
- L.. Monitor effects of human activities and habitat alteration on systems. Track the relationship between successional stages and management actions for treated and untreated areas.

**Assessment Prior to New Activities**

**Action veg2 (Phase A)** Prior to planning or initiating any watershed activity, and in conjunction with the review process for proposed plans and projects (Actions des1 and des2), **consult the GIS database**, which identifies specific vegetation communities and their associated rare, threatened, endangered, and sensitive species, to determine the level of impact of the activity on sensitive vegetation communities and species. Specific communities and areas of concern include:

- A. Sycamore Alluvial Woodland.
- B. Freshwater Marsh.
- C. Valley Oak Woodland.
- D. Serpentine Bunchgrass.
- E. Central Coast Arroyo Willow Riparian Forest.
- F. Central Coast Live Oak Riparian Woodland.
- G. Blue Oak Woodland.
- H. Valley Needlegrassland.

**Action veg3 (Phase A)** Prior to the initiation of any watershed activity that may affect an **Ecological Sensitivity Zone**,<sup>1</sup> conduct surveys for special status species and map observed occurrences

<sup>1</sup> ESZs are defined by the presence of one or more special status plants of a manageable population size and density, or by serpentine grassland soils (Obispo variant), or by plant communities supporting populations of listed animal species.

**SPECIAL STATUS SPECIES CODES**

**Federal:**

- FE= Listed as Endangered on the Federal Endangered Species List
- FPE= Proposed for listing on the Federal Endangered Species List
- FT= Listed as Threatened on the Federal Endangered Species List
- FC= Candidate for Federal listing (taxa for which the U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list as Endangered or Threatened)

BEPA= Bald Eagle Protection Act

**State:**

- CE= Listed as Endangered, California Endangered Species Act
- CT= Listed as Threatened, California Endangered Species Act
- CSC= California Species of Special Concern
- SSA= State designated special animal, designated by CDFG biologists

in the GIS database. Update ESZ mapping based on surveys. Develop and implement effective mitigation measures to avoid and minimize adverse effects on species and their natural communities. Special status plant species<sup>2</sup> are found in the following natural communities:

- A. Coastal Scrub/Grasslands (ultrama): Locale for Presidio clarkia (*Clarkia franciscana*) (FC/SE).
- B. Moist Grasslands & Vernal Pools: Locale for Contra Costa goldfields (*Lasthenia conjugens*) (FE).
- C. Serpentine Grassland, Barrens: Locale for Metcalf Cyn jewelflower (*Streptanthus albidus ssp. albidus*) (FE).

**Action veg4 (Phase A)** Prior to the initiation of any construction project involving grading, a **grading plan** shall be prepared by the project proponent and approved by appropriate SFPUC staff. Revegetation of all graded areas shall be required to the maximum extent practicable. Grading plans shall include, but not be limited to, the following:

- A. A map of the site, prepared at a scale of 1" = 500' or greater with contour intervals of at least 5 feet, including: pre-project land contours; post-construction land contours (finished grade); location of all areas to be graded, with cut banks and fill slopes delineated; and estimated dimensions of graded areas.
- B. A narrative description of the proposed grading activity, including:

its purpose; an estimate of the total volume of material to be moved; a description of the height of all cut banks and fill slopes (may be delineated on the map); a description of the provisions to be used for compaction, drainage, and stabilization of graded areas; a description of all plant materials used to revegetate exposed slopes and banks, including type of species, number of plants, size and location (may be delineated on the map), and a description of irrigation provisions or other measures necessary to ensure the survival of plantings; and a description of any other interim or permanent erosion control measures to be utilized.

**Restoration**

**Action veg5 (Phase 2)** Develop an **oak planting program** for implementation in disturbed areas in coordination with grazing and fire management activities. Guidelines include:

- A. Oaks may be planted as acorns, or 1- to 5-year planting stock, or in combination to determine relative value of approaches.
- B. Acorns, seedlings, and saplings will need protection from grazing and fossorial animals and from weeds.
- C. Plant the sapling in native soil/mulch with a fertilizer tablet, protect roots by a wire basket, protect the stem in a two-foot tall tubex, tube enclosed by wire, and water the tree by drip irrigation for 5



Alameda Creek Erosion

years. This kind of intensive program may not be feasible in less accessible areas and greater mortality would be expected in broader-scale restoration areas.

- D. Cultivate oak planting stock from acorns gathered on watershed lands.

**Action veg5.1 (Phase 2)** Develop a **native species planting program** for implementation in **disturbed areas** in coordinations with grazing and fire management activities. Guidelines include:

- A. Trees may be planted as seedlings or 1 to 5 year planting stock, or in combination to determine relative value of approaches.
- B. Acorns, seedlings, and saplings will need protection from burrowing animals and from weeds.
- C. Plant the sapling in native soil/mulch with a fertilizer tablet, protect roots by a wire basket, protect the stem in a 2-foot tall tubex tube enclosed by wire, and water the tree by drip irrigation until established (approximately three to five years). This kind of intensive program may not be feasible in less accessible areas and greater mortality would be expected in broader scale restoration areas.
- D. Cultivate native planting stock from acorns and seeds gathered on watershed lands.

- E. When selecting vegetation, minimize textural contrasts with the surrounding vegetation.

### Exotic Species

**Action veg6 (Phase 2)** Identify and remove, using IPM practices, invasive exotic plant species.

**Action veg6.1 (Phase 2)** Identify stands of exotic trees that serve as important roosting and nesting sites for various raptors and other birds protected by CDFG Code 3503. Work with appropriate agencies to preserve core habitat.

### Soils Management

**Action veg7 (Phase A)** When conducting operations, maintenance, and construction activities follow **erosion control BMPs** to ensure protection of wetlands, streams, and shoreline areas. BMPs provided in Appendix C-6 to be employed in the vicinity of wetlands and riparian areas shall be coordinated with the requirements of the CDFG Streambed Alteration Agreement (Action aqu13) and Clean Water Act Section 404 permit from the COE. Guidelines include:

- A. Schedule grading to avoid the rainy season.
- B. Stipulate disposal practices for excess material.
- C. Retain existing vegetation wherever feasible.
- D. Divert runoff from denuded areas.
- E. Minimize length and steepness of slopes.

- F. Use sediment control measures to trap sediment on-site.
- G. Inspect, monitor, and maintain sediment control measures.
- H. Minimize the total area, duration, and season of soil exposure and enforce strict controls on soil excavation, fill, and storage.
- I. Minimize discing by mowing roadside and trailside areas to reduce erosion potential.
- J. Restrict discing to slopes no greater than 5 to 8 percent, where practicable.
- K. Conduct all forest management activities in accordance with BMPs specified by the California Forest Practices Rules (Title 14 CAC) included in Appendix C-6.
- L. Minimize the disturbance of serpentine bedrock or soils to prevent erosion of asbestos fibers into water supplies.

**Action veg8 (Phase 1)** Identify areas subject to **slope instability** and failure based on the soils, geology, and landslide data layers in the GIS. Prevent erosion by implementing the applicable BMPs. Assign the highest priority for protection to areas immediately adjacent to the reservoirs and their main tributaries; assign second priority to other unstable, eroded, or erodible hillslopes. Guidelines include:

- A. Avoid placing erosion and sediment control features that increase infiltration and subsequent soil moisture on slopes that have a high probability of landslide failure.

- B. Use native grass mix to seed infrequently used fire roads and emergency access roads.
- C. Maintain infrequently used roads by mowing rather than by grading to reduce erosion and sedimentation rates.
- D. Cover infrequently used roads with chip material to stabilize

**Action veg9 (Phase 1)** Identify and indicate in the GIS areas where prior land disturbance has accelerated **mass movement or soil erosion** processes to unacceptable levels (i.e., the critical point where natural stabilizing factors cannot recover without human intervention). Record these areas in the GIS. Stabilize these areas using biotechnical methods and soil conservation BMPs. Areas of chronic gullyng or downslope soil creep, flow, or sliding that require repeated road or sediment basin maintenance should be assigned highest priority. Guidelines include:

- A. Cover disturbed areas with duff, chips, or mulch to prevent non-native species invasion (e.g., pampas grass).
- B. Re-seed with fast-growing annual grasses to out-compete invasive species and treat as required with prescribed burns.
- C. Rehabilitation may exclude, relocate, or modify land use activities and/or require slope re-contouring and revegetation.
- D. Avoid placing erosion and sediment control features that increase infiltration and subsequent soil mois-

ture on slopes a high probability of landslide failure.

- E. Slope rehabilitation and revegetation should be based on techniques developed for long-term success (rather than for short-term construction site management) from sources such as the Natural Resources Conservation Service (NRCS) National Engineering Handbook Series (Part 650), Chapters 10 (Gully Treatment) and 18 (Upland Slope Protection).
- F. Cover exposed soils of firelines and burned slopes, subject to accelerated erosion rates, with the vegetative material displaced during construction or by distributing duff, litter, or chips rather than the application of hydromulch.
- G. Use reseedling with hydromulch only in areas of severe ground disturbance.

**Action veg10 (Phase 2B)** Establish and conduct **long-term hillslope erosion and sediment control monitoring** to evaluate the effectiveness of adopted protection measures and/or rehabilitation projects and to confirm/validate the identified risk areas mapped on the GIS. The monitoring program should be designed to provide quantitative, systematically collected information. Monitoring may use representative hillslope areas within selected sub-basins that have varied land use types and intensities and should include controls for natural variability in lithology (rock type), geologic structure, slope angle/aspect, and the different slope and soil protection or rehabilitation methods.

## **Integrated Pest Management**

**Action veg11 (Phase 1)** Develop and implement an **IPM Program for the LRMS, specific to the watershed** and watershed resources, within the framework of the CCSF's City Pesticide Management Plan Ordinance (No. 274-97) and the SFPUC Draft IPMP (October 1997). Guidelines specific to implementation of the IPMP on watershed lands include:

- A. Survey pest control problems on watershed lands, including: weed and gopher control on golf courses; invasive shrubs in brushlands; introduced trees in woodlands; mosquito larvae in standing water; insect and fungal diseases in natural plant communities; feral pigs, cats, and dogs in terrestrial habitats; animal populations that act as vectors of diseases transmittable to humans; introduced bullfrogs and largemouth bass in aquatic habitats; predators near livestock operations; and cockroaches, commensal rodents, spiders, ants, wasps, and termites in buildings.
- B. Design specific procedures to address the varied needs for protection in high and moderate WQVZ's and other sensitive water quality and ecological resource areas. Procedures to be employed in aquatic habitats or in the vicinity of wetland and riparian areas shall be coordinated with the requirements of NMFS (regarding restrictions for

Federally endangered fish species), USFWS (regarding restrictions for Federally endangered plant and animal species habitat), the CDFG (regarding restrictions for state endangered species habitat and conditions for 1601 blanket agreement), and the COE (regarding conditions for a Section 404 permit in regulated wetlands and waters of the U.S.).

- C. LRMS approval is required for all pesticide uses that involve direct application to aquatic environments, use in high and moderate WQVZs and ESZs, or under conditions in which the applied pesticide could reasonably be expected to get into water bodies.
- D. Enforce geographic restrictions to pesticide application, especially in high and moderate WQVZs and other sensitive areas.
- E. Enforce seasonal use restrictions for authorized pesticide applications in aquatic habitats during the nesting season (first of March to the end of June) and during the anadromous fish season (October 15 to March 15), or as recommended by the resource and regulatory agencies.

## Coordination and Collaboration

**Action veg12 (Phase 2)** Coordinate with PG&E in clearing vegetation, as appropriate, under and around powerlines, transformers, and pole structures. Guidelines include:

- A. Ensure that the minimum amount of vegetation is removed.
- B. Ensure protection of the vegetation resources during removal.
- C. Determine the method of treatment and degree of clearance based on site factors such as slope and soils.

**Action veg13 (Phase 1)** Encourage other agencies with interest in watershed lands to minimize the disturbance of **serpentine bedrock or soils** to prevent the erosion of asbestos fibers into the water supply. 

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## 5.10 Wildlife (wil)

Wildlife on the watershed are plentiful, diverse, and play an important role in the predominantly urban region in which the watershed occurs. The importance of the watershed to wildlife is not only related to the immediate habitat opportunities, but also to wildlife movement, and for migratory birds, as a stopover along the Pacific Flyway. Special status species known to occur in the watershed include, among others, the: California red-legged frog, North-western pond turtle, bald eagle, great blue heron, burrowing owl, and the pallid bat. Preserving these species and their habitat is an integral part of maintaining the ecological balance and sustainability of the watershed.

To ensure the long-term protection of wildlife, this section presents actions focused on monitoring and regulating new and existing activities within the watershed. Strategies for the preservation, enhancement, and maintenance of wildlife movement corridors and special status species and future studies and monitoring activities are also presented.

The management actions for wildlife provided in this section are divided into the following topics:

- Assessment Prior to New Activities
- Wildlife Movement
- Wildlife Habitat
- Sensitive, Rare, Threatened, and Endangered Species
- Future Studies and Monitoring

Additional actions related to wildlife management but more appropriately addressed in other sections include:

- staff training regarding sensitive species and habitat (Section 5.17: Staffing and Training);
- actions related to maintaining an up-to-date watershed GIS database (Section 5.19: Information Management); and
- fencing prior to construction activities (Section 5.20: Design and Construction Requirements).

### Assessment Prior to New Activities

**Action wil1 (Phase A)** Prior to planning or construction, and in conjunction with the review process for proposed plans and projects (Actions des1 and des2), conduct **site-specific review of new structures**, linear facilities, parking lots, roads, or trails to be located in any habitat to avoid and minimize adverse impacts to wildlife, their movement, and habitat. Where new facilities are needed and/or construction is required, adhere to the following guidelines:

- A. Consolidate siting of linear facilities, such as trails and utility corridors, to the periphery of the watershed.
- B. Design projects to maintain connectivity between habitat types.
- C. Minimize stream crossings and locate facilities outside of high WQVZs.



*Western Pond Turtle*

- D. Avoid disturbance to bird nests during construction. Follow all stipulations of Title 14 - Forest Practice Act, when performing tree removal, including the identification of active nest sites and establishment of required buffers around those sites. Nests discovered during preconstruction surveys should be flagged and avoided until the nests are abandoned or young have fledged.

**Action wil2 (Phase A)** Conduct comprehensive (if broad-based activity) or site-specific surveys of affected habitats to more completely determine the presence or absence of listed or sensitive taxa. When making decisions related to **watershed activities** that may affect a high ESZ, develop and implement effective mitigation measures to avoid and minimize adverse effects on species and habitat. Specific requirements and guidelines include:

- A. Clear deadwood and perform timber operations outside of bird breeding season, or conduct bird nesting surveys prior to operations.
- B. Prevent disruption to any breeding areas encountered during surveys or operations.
- C. Evaluate old structures (barns, buildings, tunnels) or disturbed areas to determine if they are being used by species with specialized habitat needs (e.g., bats, owls, nesting raptors) prior to conducting restoration and/or demolition.

## Wildlife Movement

**Action wil3 (Phase 3)** Identify and protect **primary wildlife movement corridors** such as riparian corridors, and accommodate wildlife passage when designing fencing, culverts, stream crossings, and underpasses.

**Action wil4 (Phase 3)** Relocate or **eliminate unnecessary infrastructure** and facilities as opportunities arise in an effort to reduce fragmentation and disruption of terrestrial habitat over the long term.

**Action wil5 (Phase 3)** Evaluate fencing needs and **remove unnecessary, or relocate fencing** as necessary to manage wildlife movement.

## Wildlife Habitat

**Action wil6 (Phase 3)** Establish a **standard for number of snags/fallen trees/** nesting trees per acre by vegetation type and implement and protect them for wildlife use and nutrient cycling. Downwood and brush piles should be left as habitat and cover where safety and fire hazard are not concerns.

**Action wil7 (Phase 3A)** Create palatable **re-sprouting browse** through mechanical vegetation treatments or prescribed fire in brush and woodland communities.

<sup>3</sup> See list of Special Status Species Codes in Section 5.9: Vegetation, Soil, and Pest Management.

**Sensitive, Rare, Threatened, and Endangered Species**

**Action wil8 (Phase 1A)** Periodically update an LRMS sensitive species database for the watershed, including mapped locations of occurrences and specialized habitats, listing status, and current population trends. At the time of plan preparation, animals listed or proposed for listing on Federal and State Endangered Species Lists<sup>3</sup> (California Administrative Code, Title 14, Section 670.5; Federal Register, 50 CFR 17.11) and known to occur, or with a potential to occur, within existing specialized habitat on Alameda Watershed lands include the following:

- A. Insects: Serpentine phalangid (serpentine outcrops) (SSA) and Bay checkerspot butterfly (serpentine outcrops).
- B. Amphibians: California red-legged frog (ponds with emergent vegetation) (CSC/FT); Foothill yellow-legged frog (streams with some summer flow and quiet pools) (CSC); and California tiger salamander (seasonal and freshwater ponds) (CSC/FC).
- C. Reptiles: Alameda whipsnake (south facing slopes of coastal chaparral with drainages) (ST/FPE) and California horned lizard (sand and loose soil in scrub) (CSC).
- D. Birds: Cooper’s hawk and sharp-shinned hawk (nests in riparian growths of deciduous trees and live oaks) (CSC-both); Western grebe (quiet lakes with tules or rushes) (SSA); Agelaius phoeniceus (ponds,

drainages slow moving streams with abundant tules) (CSC); Golden eagle (nests in oak savanna/forages in open habitats especially over grasslands) (CSC/CFP); Great blue heron (trees along lakes and estuaries) (SSA); Short-eared owl (nests in open grasslands) (CSC); Aleutian Canada goose (winters on lakes and inland prairie) (FT); Ferruginous hawk (winters in flat open grasslands) (CSC); Black-shouldered kite (nests in trees adjacent to wet meadows and open grasslands) (CFP); California horned lark (open grasslands and irrigated pastures) (CSC); Prairie falcon (nests on cliffs, foraging from dry open terrain to marshes) (CSC); Haliaeetus leucocephalus (nests and forages on inland lakes, reservoirs, rivers) (FE/SE/CFP); Loggerhead shrike (open grasslands and shrublands) (FC2/CSC); Pandion haliaetus (fresh water lakes, and large streams near forest) (CSC); American white pelican (winters, but doesn’t nest in watershed) (CSC); and Burrowing owl (nests in mammal burrows in open sloping grasslands) (CSC).

- E. Mammals: Pallid bat (open lowland areas) (CSC); Townsend’s western big-eared bat and Western mastiff bat (caves and structures) (CSC); Berkeley kangaroo rat (open lowland areas) (SSA); Ringtail (brushy and woody courses along waterways) (CFP); and American badger

*“The importance of the watershed to wildlife is not only related to the immediate habitat opportunities, but also to wildlife movement, and for migratory birds, as a stopover along the Pacific Flyway.”*

(open grasslands with sandy soils) (CSC).

**Action wil9 (Phase 2)** Achieve regulatory compliance by developing a comprehensive, multi-species **Habitat Conservation Plan** for the species of concern on the watershed and the actions set forth in this Watershed Management Plan and other known activities to be conducted by SFPUC over the next 50 years which may significantly and broadly affect one or more species of concern. The HCP shall be prepared in cooperation and consultation with the USFWS for activities affecting species protected under the Endangered Species Act (e.g., California red-legged frog, steelhead trout, etc.). Obtain an incidental take permit for authorized activities from the USFWS based on the approved HCP.

Generally, a specific component of the HCP is prepared for each species. Guidelines for these components may include but are not necessarily limited to:

- A. Develop a vegetation management/habitat enhancement strategy for each species of concern based on scientifically sound information.
- B. Census and monitor current species populations, and implement management decisions based on monitoring and census results. Monitoring should be ongoing, using marked plots; schedule and protocol of sampling to be determined

in coordination with resource specialists at CDFG and USFWS.

- C. Delineate protected buffer areas (e.g., wetland/riparian and shoreline zones) for aquatic species based on site-specific data. These zones shall be based on the presence of suitable habitat (aquatic and terrestrial) and direct observations. Activities within the protection zones should be permitted only during the seasons when target taxa are less vulnerable.
- D. Coordinate removal of exotic vegetation with the IPM program discussed in Section 5.9: Vegetation, Soil, and Pest Management.
- E. Activities to be regulated or seasonally prohibited within protective buffer zones should include but not be limited to: removal of fill in sedimentation basins; reservoir level fluctuations; dewatering of habitat; mowing; application of pesticides; removal of emergent aquatic vegetation; mosquito abatement; and road grading and maintenance.

**Action wil10 (Phase 1)** Institute **seasonal prohibition of activities** during breeding periods and enact appropriate mitigation measures (e.g., buffer zones, restricted access) to adequately protect special status or sensitive species in the absence of site-specific surveys. Special status species can be categorized as follows:

- A. Plants or animals that are listed or proposed for listing as rare, threatened, or endangered under the California Endangered Species Act

(CESA) or the Federal Endangered Species Act (FESA).

- B. Plants or animals that are candidates for possible future listing as threatened or endangered under FESA.
- C. Plants included on lists 1A, 1B, and 2 of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994).
- D. Animals designated by CDFG as “species of special concern.”
- E. Individuals, nests, and eggs of the order Falconiformes (falcons, kites, and hawks) and Strigiformes (owls) under §3503/3503.3 of the Fish & Game Code.
- F. Animals that have been designated as “Protected” or “Fully Protected” by the Federal government under law (e.g., Bald Eagle Protection Act).

**Future Studies and Monitoring**

**Action wil11 (Phase 3) Monitor the effects of natural processes** (e.g., fires, fog, drought, wind, erosion, rock slides, mud

slides, and flooding) that are essential in maintaining the variability of the ecosystem, yet could have negative impacts if specialized or critical habitats of sensitive wildlife species are significantly affected.

**Action wil12 (Phase 3) Monitor predator-prey relationships** to provide a basis for management and control, specifically for ground squirrels, golden eagles, mountain lions, coyote, and deer.

**Action wil13 (Phase 3B) Monitor the number and type of road kills** that occur within the watershed to better understand wildlife movement patterns. Design and install wildlife passage structures that minimize losses based on monitoring surveys.

**Action wil14 (Phase 3B) Monitor populations of pest animals** such as feral cats, wild dogs, ground squirrels, and feral pigs to evaluate success in meeting population targets and to provide information for modifying control programs.



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## 5.11 Aquatic Zone Protection (aqu)

Protection of reservoir shorelines and streambanks is integral to the long-term sustainability of the watershed. Activities within this sensitive zone can increase erosion and sedimentation, which directly affects water quality, quantity, and biological resources. The actions presented in this section are focused on the management and preservation of the aquatic zone, with an emphasis on stabilizing channels and banks, reducing erosion, maintaining stable water elevations, restricting land uses, and managing sediment movement.

The aquatic zone, as referred to in this section, is generally coterminous with the high WQVZs defined for the Alameda Watershed (Figure 2-3). Limiting activities and controlling disturbance in these zones protects against delivery of sediment generated by adjacent upslope land use activities and also helps prevent contaminants from entering the streams and waterbodies.

The management actions for aquatic zone protection provided in this section are divided into the following topics:

- Assessment Prior to New Activities
- Reservoirs and Reservoir Shorelines
- Stream Channels and Banks
- Wetlands
- Sedimentation Basin Management
- Monitoring

Additional actions related to aquatic zone protection but more appropriately addressed in other sections include:

- actions to control and capture stormwater runoff (Section 5.2: Stormwater);
- actions to reduce road-related runoff (Section 5.5: Roads);
- actions to reduce the contribution of sediment into the reservoirs and to implement integrated pest management practices (Section 5.9: Vegetation, Soil, and Pest Management);
- actions for wildlife protection (Section 5.10: Wildlife); and
- actions to protect riparian corridors from cattle (Section 5.22: Grazing Management).

### Assessment Prior to New Activities

**Action aqu1 (Phase A)** Prior to undertaking or constructing any non-water-dependent facility or watershed activity, **conduct site-specific review** in conjunction with the review process for proposed plans and projects (Actions des1 and des2), to ensure that the facility or activity is not located within a High WQVZ. If feasible, relocate the activity or facility to an alternative upland site. If no feasible site exists, follow BMPs as set forth in Appendix C-6 and minimize stream crossings.



*Alameda Creek*

## Reservoirs and Reservoir Shorelines

**Action aqu2 (Phase 1)** Coordinate with the Systems Operations Section of the Water Supply and Treatment Division to **manage reservoir water levels** to maintain relatively stable water levels, where feasible subject to operational requirements and water availability, to maintain shoreline emergent vegetation and minimize shoreline erosion.

**Action aqu3 (Phase 1)** Identify and **prioritize for rehabilitation reservoir shoreline areas** within the High WQVZ which are providing excessive sedimentation into the reservoirs.

**Action aqu4 (Phase 1A)** Where possible, **prohibit** or regulate the timing or intensity of **land use activities** in the high risk shoreline segments identified in Action aqu3 consistent with other management actions in this Plan.

**Action aqu5 (Phase 1) Rehabilitate shoreline areas** using structural shoreline protection practices in areas where erosion and sedimentation cannot be adequately controlled by land use restrictions. Specific practices may vary by site and risk factors but should include the following:

A. If the dominant risk factor is concentrated runoff from upslope roads, install and maintain erosion-protected outfalls that extend far enough through the shoreline zone to safely convey runoff to the reservoir for the normal range of water

levels under anticipated Reservoir operations.

- B. In areas where perennial surface runoff can provide water during low reservoir water levels, use vegetative methods for shoreline protection. Since the shorelines of the reservoirs are not natural but may have naturalized plant communities and/or wetland areas, revegetation for the purpose of erosion control must be consistent with wetlands habitat enhancement management actions under Section 5.9: Vegetation, Soil, and Pest Management (e.g., vegetative stabilization of shorelines may be in the form of sub-impoundments within the reservoir draw-down zone).
- C. In areas where no biological resources would be jeopardized and the shoreline conditions are too adverse for vegetative stabilization to be successful, use geotechnical methods of shoreline protection (e.g., concrete riprap, geotextiles).
- D. Inspect shoreline areas during and following major water level fluctuations that occur as part of reservoir operations or due to natural climatic variability. Evaluate and rate the effectiveness of protection measures and update the GIS database identifying high risk segments.
- E. Monitor shoreline erosion and sedimentation based on long-term observations at selected locations representative of various types of high risk segments and different protection measures.

## Stream Channels and Banks

**Action aqu6 (Phase 1) Conduct a Sediment Transport Study** to identify stream segments with excessive bank erosion or channel sedimentation which are contributing excessive sediment to the streams and prioritize segments for rehabilitation based on their relative contribution to reservoir sedimentation and the relative risk to aquatic resources. Areas of bank undercutting and retreat, and channel widening, aggradation, or braiding should be assigned highest priority for rehabilitation.

**Action aqu7 (Phase 2) Rehabilitate stream segments** according to the determined priorities, and return them to a dynamic equilibrium where the channel is stable. Guidelines include:

- A. Base rehabilitation on soil bioengineering techniques developed for long-term success (rather than for short-term construction site management) from sources such as the NRCS National Engineering Handbook Series (Part 650) Chapter 16, Streambank and Shoreline Protection.
- B. Use geomorphic reconstruction to ensure long-term channel stability.
- C. Limit geotechnical bank stabilization to locations where pre-existing infrastructure prevents geomorphic or biotechnical methods from success.

**Action aqu8 (Phase 2B) Establish and conduct long-term stream corridor**

**monitoring** to evaluate the effectiveness of adopted protection measures and/or rehabilitation projects. The monitoring program should be designed to provide quantitative, systematically collected information that includes measurement of channel and bank morphology, sediment load, and channel stability/performance at representative streamflows.

## Wetlands

**Action aqu9 (Phase A) Create new wetland habitat**, where water sources are adequate, as part of a wetland mitigation banking system to be used to offset impacts to wetlands from SFPUC activities on the watershed and on other SFPUC lands. Possible wetland creation sites include installation of subimpoundments along reservoir perimeters and in conjunction with creation of the Sunol Valley water storage facilities. Seasonal wetland habitat could be increased for species such as the California red-legged frog, the California tiger salamander, and the Western pond turtle.

## Sedimentation Basin Management

**Action aqu10 (Phase 2) Develop a sedimentation basin and stock pond management program** that specifies type, location, and maintenance schedules for facilities and specifies restricted periods for maintenance of facilities located in wetland and riparian areas. Guidelines for the development of a sedimentation

*“Activities within the sensitive aquatic zone can increase erosion and sedimentation, which directly affects water quality, quantity, and biological resources.”*

basin and stock pond management program include:

- A. Evaluate existing stock ponds, which are functioning as sedimentation collection basins; where needed, construct, operate, and maintain additional sedimentation collection basins.
- B. Manage sedimentation basins and stock ponds that have well-developed wetland habitats for wildlife use in particular.
- C. Consider locating new sedimentation basin and stock pond facilities in upstream, off-channel locations that can be more easily maintained as water quality protection facilities (i.e., cleaned frequently to maintain capacity and eliminate vegetation growth).

**Action aqu11 (Phase A)** Once sediment detention basins are in place, establish **monitoring**, cleanup, and dredging **guidelines** dependent on sediment loading rate. Sediment accumulation in detention basins should be analyzed for concentrations of toxic materials and heavy metals. The accumulation of total organic carbon should be monitored and managed to prevent high loadings being discharged into waterbodies.

**Action aqu12 (Phase A)** If needed for fire management, **install** long-term **sediment retention basins** that can be readily maintained, or implement other permanent measures to prevent gully erosion in preference to installing temporary straw bale structures that decay and release stored sediments into water bodies. Do not use organic materials like straw bales within WQVZs without post-construction removal of the materials and accumulated sediment.

**Action aqu13 (Phase 2)** In conjunction with development of the HCP prepared in Section 5.10: Wildlife and the sedimentation basin management program (Action aqu10), obtain a “blanket” **Streambed Alteration Agreement (MOU)** from the CDFG (under Section 1601 of the State Fish and Game Code) for development, operation, and maintenance of sediment detention basins or other water management facility to ensure compatibility with fisheries and aquatic habitat requirements.

**Monitoring**

**Action aqu14 (Phase 2B)** Periodically **update the Bathymetry Study for San Antonio and Calaveras Reservoirs** to assess the impacts of stream and sedimentation basin rehabilitation on reduction in sediment transport.



## 5.12 Fishery Resources (fis)

Important and sensitive fishery resources in the watershed include anadromous steelhead trout and resident rainbow trout. SFPUC’s portion of the Alameda Watershed has been managed by CDFG as a non-anadromous fishery, and a “put-and-take” rainbow trout fishery was established in the Niles Canyon area of Alameda Creek in 1974, with annual trout plants of 30,000 fish. A recent MOU between SFPUC and CDFG will allow for the establishment of a water release and recapture facility on Alameda Creek to enhance both trout fisheries and maintain native non-game fisheries. The facility is generally located between Calaveras Reservoir and the Sunol WTP.

Maintaining high water quality and adequate water quantity has a direct impact on the survival and reproduction of fishery resources. The actions set forth in this section are focused on increasing coordinated efforts between the SFPUC and CDFG for the protection of sensitive fish species, as well as overall management and preservation of fish migration opportunities and habitat management. Future studies and monitoring identified below will play an integral role in the ongoing application and refinement of these actions.

The management actions for fishery resources provided in this section are divided into the following topics:

- Fish Migration
- Habitat Management
- Future Studies and Monitoring

Additional actions related to fisheries management but more appropriately addressed in other sections include:

- maintenance and management of stormwater flows (Section 5.2: Stormwater);
- measures to prevent and control hazardous spills (Section 5.3: Hazardous Materials and Contaminants);
- erosion control measures and measures to implement integrated pest management practices (Section 5.9: Vegetation, Soil, and Pest Management);
- preparation of an HCP for species of concern including steelhead trout (Section 5.10: Wildlife); and
- general actions to protect reservoir shorelines, streams, and wetlands (Section 5.11: Aquatic Zone Protection).

### Fish Migration

**Action fis1 (Phase 1)** Maintain access for fish species of concern from reservoirs to upstream spawning grounds in streams tributary to San Antonio and Calaveras Reservoirs by eliminating unnecessary artificial barriers, creating fish passage structures, and allowing sufficient flows (where regulated) during critical breeding periods.

*“Maintaining high water quality and adequate water quantity has a direct impact on the survival and reproduction of fishery resources.”*

**Action fis2 (Phase 2)** Identify all unauthorized **stream diversions** and remove those that are detrimental to fish passage in adherence to all existing regulations.

**Action fis3 (Phase 3)** Ensure that any **subimpoundments**, located within perennial or intermittent drainages, along the periphery of reservoirs for enhancing wetland and aquatic habitat, are designed to allow fish passage.

**Action fis4 (Phase 2A)** Where stream alterations and diversions exist or cannot be avoided, consult with CDFG regarding **installation of fish screens and/or fish passage structures** to prevent entrapment and mortality.

### **Habitat Management**

**Action fis5 (Phase 2)** In appropriate locations, allow an appropriate level of **accumulation of woody debris** in stream channels, consistent with CDFG recommendations, to create pools and riffles, to reduce bank steepness, and to provide cover, especially in stream reaches subject to heavy grazing in the past.

**Action fis6 (Phase 1)** Identify and adopt alternative **non-toxic management practices** for the protection of aquatic resources in coordination with the IPM program (see action veg11). Guidelines include:

- A. Minimize the use of copper sulfate in the treatment of algal blooms in reservoirs.
- B. Dechlorinate water before it is discharged to streams and reservoirs.
- C. Limit use of chemical fire retardants and Class A foams (except protein-based foams) in or near aquatic zones.

**Action fis7 (Phase 3B)** Conduct strictly **regulated non-native fish depredation** in conjunction with CDFG to control populations of predaceous exotic game fish, such as largemouth bass, in reservoirs.

### **Future Studies and Monitoring**

**Action fis8 (Phase 3B)** Conduct **annual surveys** of fish populations and habitat conditions in conjunction with water temperature and water quality monitoring. Select representative habitat sites for long-term, systematic monitoring. 

## 5.13 Cultural Resources (cul)

The geography and abundant resources offered by the watershed have yielded a long history of human occupation. The creeks, valleys, and terraces of the watershed may have provided homelands for the Ohlone and other indigenous people. More recent activities, associated with SFPUC and its predecessors, have produced historical resources such as the Sunol Water Temple and the Calaveras Dam.

Activities that could potentially disturb known and currently unknown resources include operations, maintenance, and construction activities. The following actions provide the framework for future review procedures (e.g., prior to authorizing new construction activities), as well as the ongoing protection and maintenance of known resources and monitoring of approved construction operations.

The management actions for cultural resources provided in this section are divided into the following topics:

- Assessment Prior to New Activities
- Protection of Existing Resources
- Monitoring

Additional actions related to cultural resources include:

- staff training pertaining to cultural resources protection (Section 5.17: Staffing and Section 5.19: Information Management);

- requirements for new construction (Section 5.20: Design and Construction Requirements); and
- actions related to the Sunol Water Temple (Section 5.21: Sunol Valley).

### Assessment Prior to New Activities

**Action cul1 (Phase A)** Conduct appropriate levels of **review** in conjunction with the review process for proposed plans and projects (Actions des1 and des2), **prior to** operations and maintenance activities as well as construction activities involving **surface disturbance** (e.g., ground clearing, discing, grading, mechanical brush removal, and prescribed burns) and/or excavation to avoid damage to buried cultural resources in the vicinity of known sites and within mapped cultural sensitivity zones. Sensitivity zones generally include valley floors adjacent to water sources, other flat terrain near creeks and springs, and level areas along ridgetops. Guidelines include:

- A. Prior to any excavation activities, request a database check from the watershed GIS operator and the State of California database for any known cultural resources or sensitive areas within the vicinity of proposed excavation activity.
- B. Authorize archival research and field reconnaissance by a certified specialist or archeologist of any pro-



*Sunol Water Temple*

*“The geography and abundant resources offered by the watershed have yielded a long history of human occupation.”*

posed project site and vicinity of proposed surface disturbance and/or excavation.

- C. Consult with the local Native American tribes (Ohlone) as required by Federal, State, and local legal requirements when considering subsurface testing and excavation of prehistoric archaeological sites. All aspects of proposed actions shall be addressed including the treatment of cultural materials and in particular the removal, study, and reinterment of Native American burials.
- D. Recommend project modifications or alternative sites that would avoid adverse effects to highly sensitive and significant cultural resource sites and features, including developing and implementing mitigation measures in accordance with all applicable State and Federal laws.

**Action cul2 (Phase A)** Authorize **data recovery** by qualified professionals in circumstances where archaeological deposits cannot be preserved through avoidance or protection measures. Guidelines for data recovery include:

- A. Work shall be accomplished within the context of a detailed research design program conducted with current professional standards.
- B. Research design program shall result in the extraction of sufficient volumes of archaeological data so

that important regional research considerations can be addressed.

**Protection of Existing Resources**

**Action cul3 (Phase A)** When considering **demolition or alteration of an historic structure**, consult with an architectural historian to determine the feasibility and suitability of relocation; although the integrity of setting would be lost, the structure would be preserved.

**Action cul4 (Phase A)** **Evaluate and document** the significance of **cultural resources** threatened by demolition or alteration through application of criteria set forth in the Secretary of the Interior’s Standards and Guidelines, State CEQA Guidelines, and the California Register of Historic Places. Where applicable, recommend registration of cultural resources deemed to be eligible for the National Register of Historic Places and the California Register of Historic Places.

**Action cul5 (Phase A)** **Employ non-destructive methods** when undertaking research activities, to the maximum extent feasible and where practical, to leave the features of sites and structures in place. Data, objects, and specimens recovered from research sites shall be conserved and curated according to legal requirements.

**Action cul6 (Phase A)** **Suspend excavation activities** in the event that suspected

cultural resources are uncovered; consult with a qualified archeologist regarding the significance, disposition, and treatment of artifacts; and revise, as necessary, excavation plans to avoid and/or minimize damage to known cultural resources.

**Action cul7 (Phase A) Suspend excavation activities** in the event that **human remains** are discovered and immediately inform the county coroner. Consult with a qualified archeologist to determine if the remains are of Native American origin, and if so, contact the California Native American Heritage Commission to identify most likely descendants for instructions regarding the treatment and disposition of human remains and associated grave artifacts.

**Action cul8 (Phase A)** When previously **unknown cultural resources** are discovered, report new findings to the California Historical Resources Information System (Information Centers) using standard descriptive methods.

**Action cul9 (Phase 2)** Implement **protective measures**, where necessary, to eliminate and minimize potentially negative effects of public access on cultural resources. Guidelines include:

- A. Cover fragile cultural deposits and features with imported soils (and possibly non-intrusive landscaping).
- B. Install compatible fencing to restrict physical access but allow viewing of trail-side archaeological sites.
- C. Allow access to highly significant sites only through supervised tours.

**Action cul10 (Phase A)** Prior to initiating new construction, **consider re-use** of existing historic structures for departmental uses. Prior to modifying historic structures, an architectural historian shall be consulted to determine the feasibility and suitability of any modifications.

**Action cul11 (Phase 2B) Periodically inspect historic structures** for pest damage and use IPM techniques to control pests in historic structures.

**Monitoring**

**Action cul12 (Phase 2B) Periodically monitor known significant cultural resource sites** for evidence of disturbance, damage, or vandalism. 

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## 5.14 Environmental Compliance (env)

Adoption and implementation of the Watershed Management Plan triggers the need for environmental review pursuant to CEQA. As described in Section 2.18, a program-level EIR is being prepared for adoption of the Plan. Implementation of individual projects and activities identified within the Plan may be subject to subsequent, project-level environmental review under CEQA. Such analysis would tier off of the program-level EIR. In addition to environmental review, implementation of some of the activities identified in the Plan may trigger the need to obtain a permit or other approval/review (refer to Section 2.18 for additional detail).

The actions presented below describe the methods by which subsequent environmental review and other environmental compliance activities could be facilitated by SFPUC staff.

The management actions for environmental compliance provided in this section are divided into the following topics:

- Environmental Compliance Responsibilities
- Assessment Prior to New Activities/Leases
- EIR Mitigation Measures
- Coordination and Collaboration

### Environmental Compliance Responsibilities

**Action env1 (Phase 2)** Assign **environmental compliance duties** to an existing or new LRMS staff member. This staff member would oversee and facilitate all environmental compliance activities within the watershed. Primary responsibilities include:

- A. Function as primary liaison to the SFPUC BERM, BSSP, and OER for review of all new projects/act as a clearinghouse for all new project applications.
- B. Develop and administer a CEQA applicability checklist in conjunction with BERM, BSSP, and OER for use in all new projects within the watershed.
- C. Oversee implementation of Mitigation Monitoring and Reporting Program (which will be prepared and adopted as part of the program-level EIR for this Plan).
- D. Ensure that all conditions of Plan approval are incorporated into this Plan and implemented.
- E. Act as primary liaison for LRMS with other regulatory agencies to ensure that the section stays abreast of applicable requirements and foster open communication and strong working relationships with such agencies and their staff.
- F. As a result of interagency liaison efforts, develop and provide a permit/approval checklist for internal

*“Implementation of individual projects and activities identified within the Plan may be subject to subsequent, project-level environmental review under CEQA.”*

SFPUC circulation and for private entities proposing projects within the watershed.

- G. Develop and oversee a system designed to track internal compliance with environmental regulations, including maintaining copies of all active permits.
- H. Staying current on and keeping appropriate staff informed of all applicable existing and new laws, rules, regulations, and listings by USFWS, CDFG, and other agencies.
- I. Administer once annually a training seminar for all relevant SFPUC staff on current environmental compliance requirements and responsibilities.
- J. Update sections of the Watershed Manual (Action saf12) that address environmental compliance mechanisms and responsibilities, as necessary.

**Assessment Prior to New Activities/Leases**

**Action env2 (Phase A)** Upon receiving a proposal for a new project or activity (as defined in Policy WA19) within the watershed, **review in coordination with BERM** and the review process for proposed plans and projects (Actions des1 and des2) to determine if such activity qualifies as a “project” as defined by CEQA.

**Action env3 (Phase A)** Require consultation with the LRMS environmental compliance staff member (see action

env1) as a **condition of all new leases and renewals** granted within the watershed. The terms and requirements for consultation shall include, at a minimum, an initial meeting prior to issuance of the lease to determine specific lease requirements, and future permit/Plan requirements. Subsequent consultation will be required upon implementation of any new programs, construction, or activities which would alter the existing site.

**Action env4 (Phase A)** Require that SFPUC staff responsible for watershed activities (both ongoing operations and maintenance activities and new programs) **consult** and get assistance from the LRMS **environmental compliance staff member** prior to implementation.

**EIR Mitigation Measures**

**Action env5 (Phase 1) Incorporate mitigation measures** identified in the program-level Alameda Watershed Management Plan EIR into a revised version of this Plan as appropriate (i.e., incorporate into relevant actions, create new actions, and/or modify existing actions).

**Coordination and Collaboration**

**Action env6 (Phase A)** Provide **comments on environmental documents** for any projects within the greater hydrologic watershed to ensure that potential adverse effects on San Antonio and Calaveras Reservoirs and SFPUC lands

are mitigated to the fullest extent.

Guidelines include:

- A. Designate an individual responsible for receipt, distribution, and response to planning initiatives in Alameda and Santa Clara Counties.

**Action env7 (Phase 1)** Due to the large volume of ongoing SFPUC projects requiring environmental review and mitigation monitoring, work with other SFPUC departments and MEA to develop a new position within MEA responsible for environmental review and mitigation monitoring related to all SFPUC projects.



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## 5.15 Lease and Permit Requirements and Monitoring (lea)

Uses and activities, other than those undertaken by the SFPUC for normal watershed operation and maintenance, on SFPUC-owned lands require the execution of a lease and/or permit from the SFPUC. This provides the opportunity to ensure that uses and activities on SFPUC lands are conducted in an acceptable fashion, consistent with the actions presented in this chapter, as well as the goals and policies of this Plan. Public Access Permits allow for scientific, educational, agency, and group access and are administered by LRMS staff. Land Use Permits and Leases allow for specific ongoing activities on the watershed such as grazing, aggregate mining, nurseries, etc. These Land Use Permits and Leases are granted by the Bureau of Commercial Land Management. However, once Land Use Permits and Leases are granted, LRMS staff oversee the activities on the land.

The management actions for lease and permit requirements provided in this section are divided into the following topics:

- Public Access Permits
- Land Use Lease and Permit Requirements

Additional actions related to lease and permit requirements but more appropriately addressed in other sections include:

- periodic review of utility lessees emergency response plans (Section 5.8: Safety and Security);

- required assessment for natural and cultural resources prior to new activities (Section 5.9: Vegetation, Soil, and Pest Management; Section 5.10: Wildlife; Section 5.11: Aquatic Zone Protection; Section 5.13: Cultural Resources);
- IPM education for lessees (Section 5.9: Vegetation, Soil, and Pest Management);
- actions related to consultation with environmental compliance staff prior to lease issuance (Section 5.14: Environmental Compliance);
- training for staff/docents/trail group leaders (Section 5.17: Staffing and Training); and
- assessment of lease and permit costs and benefits (Section 5.18: Fiscal Framework).

*“Leases and permits provide the opportunity to ensure that uses and activities on SFPUC lands are conducted in an acceptable fashion, consistent with the goals and policies of this Plan.”*

### Public Access Permits

**Action lea1 (Phase 1)** Develop and staff a **Scientific, Educational, and Agency Permit Reservation System** to provide access for qualified research and educational pursuits and assign access permit reservation duties (also Action lea2) to an existing or new LRMS staff member. Guidelines include:

- A. Permit applications should be made electronically, by telephone, or by mail.
- B. Requests should identify the type of activity desired, the location and duration of the activity.

- C. The group requesting the permit must be a qualified non-profit organization, educational institution, or public agency.
- D. Fees will be waived for qualified organizations.
- E. The Scientific, Educational, and Agency Permit Reservation System should be coordinated with the Public Access Permit Reservation System so that electronic requests can be made

**Action 1ea2 (Phase 1) Develop and staff (in coordination with Action 1ea1) a Watershed Information and Public Access Permit Reservation System** for all individual and group public access activities that is informative and easy to use. The system will:

- A. Provide schedules and a reservation system for docent-led tours including meeting times, locations, routes, and fees.
- B. Identify which docent led tours are filled and which have available space.
- C. Identify permit requirements for non-docent led access.
- D. Identify fees and methods of payment for docent and non-docent led access. Fees will be set by the SFPUC and reviewed annually.
- E. Identify which areas of the watershed are open and closed to the general public.
- F. Identify trail closures and other regulations and restrictions.
- G. The reservation system will be made readily accessible by providing ac-

cess through the SFPUC's Internet website, telephone, and by mail.

- H. The reservation system will be easily understandable through the application of user friendly software and instructions.
- I. Allow for the electronic reservation and issuance of permits for trail access and watershed facilities.
- J. Provide up-to-date watershed-related information via bulletins and announcements, which shall be revised on a regular basis.

**Land Use Lease and Permit Requirements**

**Action 1ea3 (Phase 1)** In coordination with the Bureau of Commercial Land Management, **ensure that all new leases and easement agreements as well as existing leases** when they come up for renewal include: water quality protection measures, required BMPs, emergency response plans, monitoring programs, inspection privileges, water conservation measures, IPM policies and practices in compliance with the IPM plan, and schedule of enforcement procedures and penalties. Direct the SFPUC to seek whatever authority necessary to enforce these regulations. The following elements should be included and implemented as part of amended, new, or renewed leases:

- A. Require lessees to provide funds for ongoing water quality monitoring and any necessary remediation or alterations to their activity due to the results of monitoring.

- B. Require the use of and adherence to all policies set forth in the Watershed Management Plan and the measures and mechanisms set forth in the Watershed Manual.
- C. Require leases to provide storage, transfer, containment, maintenance, repair, and disposal procedures.
- D. Require review and comment from SFPUC staff prior to application of hazardous chemicals.
- E. Require maintenance/repair/replacement schedule for sanitation and waste treatment systems.
- F. Require the development and implementation of an emergency response plan for various scenarios (i.e., earthquake, fire, hazardous materials spill, etc.) and state time elapsed between event and notification of SFPUC.
- G. Develop and implement nutrient control BMPs to control and mitigate runoff before entering tributaries, and incorporate changes in leases. For example, create buffer strips and revegetate riparian corridors to maximize absorption and breakdown of fertilizers, particulates, organic compounds, etc.
- H. Require implementation of water conservation techniques and recycled water. Install water meters and establish billing rates that encourage conservation.
- I. Define contingency plans and enforcement penalties if disturbed soil is not stabilized before the onset of wet weather.

- J. Require that all vehicles and equipment used by a lessee are serviced regularly.
- K. Require that all vehicles are equipped with spark arrestors and that each vehicle carries fire suppression equipment.
- L. Activities that have the potential to negatively affect water quality shall not be located in the High Water Quality Vulnerability Zones and, at a minimum, shall be located at least 300 feet away from any stream or water body.

**Action 1ea4 (Phase 1B)** In conjunction with the Water Quality Bureau, develop a **water quality protection and monitoring plan for each lease** to identify water quality improvements and to quantify potential water quality impacts of lease operations and permitted activities. Guidelines include:

- A. Identify structural measures and improvements to improve water quality protection.
- B. Establish responsibilities for (i.e., SFPUC or lessee) and a completion date for implementation of water quality improvements.
- C. Monitoring shall be conducted by Water Quality Bureau staff or an independent lab.
- D. Costs of monitoring and water quality analysis as well as any remediation required due to degraded water quality will be borne by the lessee, as required by their lease.

- E. Monitor surface water runoff at key stream and reservoir locations as well as groundwater quality monitoring, as necessary.
- F. Monitoring will be conducted periodically at an interval determined to be appropriate for the activities being monitored.

**Action 1ea5 (Phase A)** Prior to approval of leases and permits requiring the use of pesticides, **review** the **CHAMP** prepared by the lessee or permittee in coordination with the SFPUC IPMP and the LRMS IPM Program. The CHAMP should include, at a minimum, the following:

- A. An analysis of available non-chemical alternatives for each pest management problem and rationale for proposed chemical and pesticides use.
- B. A list of compounds proposed for use, including but not limited to: fertilizers, insecticides, fungicides, vermicides, rodenticides (e.g., for gopher control), and herbicides. Require submittal of the Pesticide Use Proposal forms described above for all compounds. Only approved compounds used at approved application rates will be allowed on leased properties.
- C. A pre-determined set of criteria for compound application based on field conditions at the time of application to avoid excessive runoff or other application events.
- D. A plan for large-scale control measures such as artificial wetlands, detention/recycling of runoff, and localized groundwater containment by pump-

ing for irrigation needs, to ensure that delivery of constituents to local streams and reservoirs is minimized or eliminated.

- E. A professionally designed spill contingency plan to prevent release of turf compounds during spills or upsets.

**Action 1ea6 (Phase A)** Prior to approval of mineral, sand, and gravel leases, **review the reclamation plan** prepared by the lessee. Plans should include, at a minimum, the following:

- A. A map of the site, at a scale of 1 inch = 500 feet or greater with 5-foot contour intervals or greater; showing pre-development land grades and post-development, final land grades; locations of topsoil stockpiles for eventual reclamation use; location of catch-basins or similar drainage and erosion control features employed for the duration of the use; and the location of storage, processing, and equipment areas employed for the duration of the use.
- B. Elevation drawings (cross-sectional profiles of the site) showing pre- and post-development appearance and grade of the site;
- C. Descriptions of the proposed use, in terms of estimated quantity of material removed, estimated duration of the use, processing activities, etc.
- D. Description of the drainage/erosion control features to be employed for the duration of the use.
- E. A landscaping plan, indicating the species, number, size, and location of plantings for the final reclaimed

grade, as well as a description of irrigation provisions or other measures necessary to ensure the survival of plantings.

**Action lea7 (Phase A)** Prior to the approval of any lease or permit, conduct a **GIS database query** (Action inf4) to determine if any significant natural or cultural resources are present.

**Action lea7.1 (Phase B)** Periodically **monitor** the **activities of lessees and permittees** on the watershed to assure that ongoing activities do not exceed the carrying capacity of watershed resources, resulting in resource degradation. Recommend changes to the activity to ameliorate any resource degradation.

**Action lea8 (Phase 1)** Assign the duties of **lease coordinator** to an existing or new LRMS staff member responsible for overseeing Actions lea4, lea5, lea6, and lea7.1.



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## 5.16 Public and Agency Outreach (pub)

Public and agency outreach is the mechanism by which the SFPUC can communicate relevant information and protection strategies for the watershed, as well as enhance inter-agency coordination on regional issues which affect the watershed. The actions presented below highlight the primary focus of this effort and emphasize on- and off-site education, active community participation, coordination with relevant agencies and land owners, and the publication of rules and regulations related to prohibited and permitted uses.

The management actions for public and agency outreach provided in this section are divided into the following topics:

- Public Education Program
- Facilities and Information
- Docent Program
- Coordination and Collaboration

Additional actions related to public and agency outreach but more appropriately addressed in other sections include:

- actions to develop a watershed information and permit system (Section 5.15: Lease and Permit Requirements); and
- actions related to coordination and collaboration with other agencies and members of the public (Section 5.3: Hazardous Materials and Contaminants; Section 5.4: Waste - Human and Animal; Section 5.8:

Safety and Security; Section 5.9: Vegetation, Soil, and Pest Management; Section 5.12: Fishery Resources; and Section 5.19: Information Management).

### Public Education Program

**Action pub1 (Phase 1)** Develop and implement an overall **Watershed Public Education Program** to implement the actions set forth in this section as well as other public education duties, as applicable.

**Action pub2 (Phase 1)** Designate an existing or new LRMS staff member with credentials in natural resources public education to assume the responsibilities of **implementing the overall public education program**. Responsibilities include:

- implementation of all public education plan actions;
- community program coordination;
- public agency coordination;
- public information development; and
- coordination of speakers and tours.

### Facilities and Information

**Action pub3 (Phase 2)** Establish “gateway” information **kiosks** at major entryways to the watershed. Information at these facilities should include:



*Public Involvement*

- A. Visitor orientation and map of the area.
- B. History, purpose, and rules and regulations pertaining to the watershed and its use.
- C. Exhibits on the diverse features and resources located within the watershed.
- D. Information that encourages visitors to visit the Watershed Visitor Education Center (see Action pub4).
- E. Importance of water quality protection and water conservation.
- F. Information related to ongoing volunteer efforts on the watershed and how one can get involved (e.g., docent program, ecological restoration work, etc.).
- C. Increased awareness and appreciation of the outstanding diversity of natural, cultural, scenic, and recreational resources of the watershed, as well as the avoidable, unavoidable, and beneficial human interactions with the watershed. A variety of ways to enhance the visitor's experience in the watershed shall be considered, such as a working model of each watershed and audiovisual presentations.
- D. Provide a full spectrum of barrier-free (e.g., physical, linguistic, cultural, sensory) interpretive opportunities.
- E. Day-use opportunities, with an emphasis on preservation of the natural landscape, wildlife values, and interpretation of the area's cultural resources, should be provided at or adjacent to the education center. These might include an interpretive loop trail system highlighting the natural resources of the watershed, as well as wetlands restoration and other ongoing watershed management programs; picnic facilities; and an outdoor setting (e.g., amphitheater) for group discussions and lectures.

**Action pub4 (Phase 2) Establish a Watershed Visitor Education Center** as a gathering place for the discussion of topics such as water quality/supply concerns, water conservation, ecological resource studies, natural history field programs, etc. The facilities shall include but not be limited to providing the following:

- A. Watershed area visitor information, including maps; brochures; and the purpose, history, and rules and regulations governing the use and management of the watershed.
- B. Programs and measures to protect sensitive cultural and/or natural resources (to be required as a part of any effort to interpret such resources).
- F. Information about the risks to water quality from the use of fertilizers, pesticides, herbicides, metals, hazardous materials, liquid propane or other fuels, cleansers and solvents, and other chemicals.
- G. Information relating to fire, including risks, prevention, and the need for treatment.

H. Representative portions or components of non-operative historic water facilities and structures for use in historic displays, as appropriate.

**Action pub5 (Phase 2)** Develop a coordinated **graphics and signage program and supporting manual** for the watershed which includes the following types of signage:

- Identification signage is provided to name or “identify” public areas and facilities as well as watershed boundaries to the user.
- Directional signage “directs” the user to a particular destination or in a particular direction of travel.
- Regulatory signage is provided to identify permitted/prohibited uses, to warn users of possible hazards and inform visitors of other pertinent regulations.
- Interpretive signage explains or “interprets” information pertaining to a particular site feature or subject.

Guidelines include:

- A. Establish a design compatibility between the four types of signage.
- B. Determine the appropriate locations for each type of sign.
- C. Signs associated with the use of a building(s) will be placed flat on the outside walls of building(s), not on roof(s).
- D. All signs will meet the following standards: signs and associated support structures should be unobtrusive and should not significantly

contrast with the surrounding setting; colors should blend with the setting while allowing for sufficient contrast of lettering needed to clearly communicate the intended message; backs of all signs should be unobtrusive, non-reflective, and blend in with the setting; internal illumination or backlighting is prohibited for all signs; and spot lighting of signs may be allowed where needed for safety.

- E. The following signs are prohibited on the watershed: luminous signs or those with intermittent or flashing lights, exclusive of signs otherwise needed for warning or safety reasons (luminous signs include those signs that give forth their own light, or any transparent or translucent sign through which artificial light is emitted, including any neon sign, fluorescent sign, or advertising light display); billboards; signs that move or give the appearance of moving, exclusive of signs otherwise regulated for purposes of warning or safety; and portable or wheeled signs, or signs on parked vehicles where the sign is the primary use of the vehicle.
- F. The following signs are allowed on the watershed following SFPUC review: signs required for ordinary repair, maintenance, and cleaning activities, provided no changes occur in size, structure, color, or message; one temporary construction site identification sign that is not greater than 32 square feet (removal

*“Public and agency outreach allows the SFPUC to communicate relevant information and protection strategies for the watershed and enhance inter-agency coordination on regional issues.”*

must be accomplished upon project completion); temporary signs needed by public service/utility companies indicating danger and/or service and safety information (removal must be accomplished upon project completion); signs warning the public against trespassing, danger from animals, the private nature of a road, driveway or premise, or signs prohibiting or otherwise controlling land use, provided such signs are not greater than two square feet; and signs posted by governmental jurisdictions giving notice to the public (such signs shall be no larger than that required to convey the intended message, and unless otherwise permitted or regulated, shall not exceed one square foot).

**Action pub6 (Phase 1)** Develop a **mobile watershed exhibit** to be displayed at popular (i.e., highly visited) Bay Area locations (e.g., the San Francisco Zoo, Golden Gate Park’s Natural History Museum, the Exploratorium) and local schools in cooperation with appropriate staff from the City of San Francisco and other applicable agencies and groups. The exhibit shall address water quality protection, water conservation, watershed history, the watershed’s natural and cultural resources, and management of the watershed.

**Action pub7 (Phase 1)** Develop a **public use areas map** to be distributed at watershed kiosks, the Watershed Visitor

Education Center (if constructed), and by docents. The map shall include but not be limited to:

- A. Trails available for public access.
- B. Trails available for docent-led access.
- C. Public roads and parking areas.
- D. Public facilities including restrooms and the Watershed Visitor and Education Center.
- E. Watershed rules and regulations.

**Action pub8 (Phase 2)** Develop **brochures and displays** to be used at watershed kiosks and at the Watershed Visitor and Education Center. The brochures and displays shall include, but not be limited to, the following:

- A. Highlight the importance of, and provide practical methods for, water quality protection and conservation.
- B. Highlight watershed history and its ecological, cultural, and scenic resources.
- C. Provide information relating to fire, including risks, prevention, and the need for treatment.
- D. Provide information related to non-toxic alternatives and minimizing application of fertilizers, pesticides, herbicides, and other hazardous materials; erosion control from gardening, landscaping, construction, and maintenance procedures; conserving and enriching topsoil; organic lawn care and gardening practices; composting methods; water conservation techniques; and use of recycled water.

**Action pub9 (Phase 1) Publish rules and regulations** regarding prohibited and permitted uses, potential hazards, emergency numbers, water supply protection and risk minimization measures, and other safety and security issues in SFPUC brochures, bulletins, water bill inserts, newsletters, and permit applications; post at all major trailheads.

**Action pub10 (Phase 1A) Provide and periodically update select watershed information** to the public and agencies (e.g., data and permit information) using SFPUC's Internet website.

### **Docent Program**

**Action pub11 (Phase 1) Develop a docent program** coordinated with the Public Access Permit Reservation System (Action lea2) to allow individuals access to select areas of the watershed that are generally closed to public access. Guidelines for developing the docent program include:

- A. The docent program will be administered by SFPUC, coordinated by the public education coordinator, and staffed by trained volunteers.
- B. User fees shall be charged to individuals partaking in docent-led tours to cover SFPUC administration costs associated with the program and other related costs.
- C. Docents will be routinely trained or retrained by SFPUC staff. Docents will be taught about trail locations, etiquette, and SFPUC's watershed rules and regulations.

- D. Docents will conduct tours according to an established and publicized schedule and will be available at predetermined locations at assigned times to accommodate pre-registered visitors and walk-up visitors. Tours will be limited to no more than 25 persons per tour.
- E. Topics for docent-led tours should include the archeologic and historic heritage of the watershed, the historic development of water system facilities, water quality protection, water conservation and reclamation, sensitive natural resources, and fire prevention.

### **Coordination and Collaboration**

**Action pub12 (Phase A) Collaborate** with appropriate agencies/groups (i.e., non-SFPUC groups managing land within the watershed) in the development of **educational materials**.

**Action pub13 (Phase 1) Develop written agreements with public and private landowners** outside of SFPUC-owned watershed lands to institute voluntary restrictions on land uses and activities that protect water quality.

**Action pub14 (Phase A) Coordinate** with other applicable agencies and organizations in the compilation and maintenance of **resource databases** to protect and manage watershed lands.

**Action pub15 (Phase A) Coordinate** with Federal, State, regional, and local agencies on the development of watershed **educational displays and brochures**.

**Action pub16 (Phase 1) Coordinate** with **Bay Area schools and universities** to develop watershed-based curriculum, specific projects, and internships.

**Action pub17 (Phase 3) Identify and** implement watershed ecological **restoration projects** or monitoring studies as components of a watershed-based curriculum in applicable Bay Area schools and universities.



## 5.17 Staffing and Training (sta)

To adequately protect and enhance watershed resources, as well as to implement and enforce the actions set forth in this Plan, the SFPUC must have sufficient staff, resources, and appropriate training.

The management actions for staffing and training provided in this section are divided into the following topics:

- Staffing
- Enforcement Procedures Training
- Watershed Resource and Watershed Management Plan Training
- Fire Management and Emergency Response Training

Additional actions which are related to staffing and training but are more appropriately addressed in other sections include:

- actions related to fire management activities and emergency response procedures to be conducted by SFPUC staff (Section 5.7: Fire Management);

### Staffing

**Action sta1 (Phase 1)** Identify all existing LRMS **staff responsibilities**, all LRMS responsibilities identified in this Plan, and all non-LRMS staff responsibilities that are watershed-related. Ensure that the number, type, and classification of staff positions are adequate to assume these responsibilities.

Wherever possible, **assign responsibilities** to existing staff. Where necessary, hire new staff and/or create new positions to fill those responsibilities which cannot be met by existing staff. Outside contractors may be considered for selected short-term responsibilities. Staff responsibilities identified in this Plan include various assessment, management, operational, coordination, and monitoring activities as well as the following specific duties:

- Fire Management Plan implementation coordinator (Action fir13)
- Safety coordinator (Action saf3)
- Environmental compliance coordinator (Action env1)
- Permit reservation coordinator (Actions lea1 and lea2)
- Lease coordinator (Action lea6)
- Public education coordinator (Action pub2)
- Watershed natural resources center coordinator (Action inf1)
- GIS coordinator (Action inf2)
- Watershed web page coordinator (Action inf5)
- Proposed projects review coordinator (Action des3)

**Action sta2 (Phase 1)** Evaluate all watershed operations and maintenance activities and **establish standards for staff** and time allocations for each activity, which can then be applied to watershed operations and maintenance tasks.

*“To adequately protect and enhance watershed resources and implement and enforce the actions set forth in this Plan requires sufficient staff, resources, and appropriate training.”*

Prior to execution of specific operations and maintenance activities, determine, based on these standards, appropriate staff and time allocations for the specific tasks. This information should be utilized as part of the Water Supply and Treatment Division work order system.

**Action sta3 (Phase 1)** Assign a watershed management **staff member to oversee watershed maintenance activities** not under the direct authority of LRMS staff (e.g., pipeline maintenance). This individual should be trained in the resources of the watershed to ensure adherence to BMPs and protection of the watershed's natural and cultural resources.

**Action sta4 (Phase 1)** **Provide adequate staff** to monitor legal watershed activities including public day use and hiking, as well as illegal activities such as vandalism, trespassing, and inappropriate disposal of waste.

### **Enforcement Procedures Training**

**Action sta5 (Phase 1)** Provide **training for** watershed keepers and LRMS staff in **enforcement and safety procedures** and identification of activities that could directly or indirectly (e.g., vegetation damage) result in water quality degradation. Training should include an overview of basic water quality issues including the activities that can negatively affect water quality, sample col-

lection procedures, and water quality monitoring methods.

### **Watershed Resource and Watershed Management Plan Training**

**Action sta6 (Phase 1)** **Conduct water quality and ecological resources training** for LRMS staff, operations supervisors and crews, SFPUC and UEB engineers, and project managers to familiarize workers with the locations of and appropriate responses to High WQVZs and ecological resources, particularly within the vicinity of High ESZs.

**Action sta7 (Phase 1)** **Conduct training classes for** watershed managers, watershed keepers, and crew supervisors on the management and protection of significant known and unknown **cultural resources**. Workers should be trained identify potential locations of and appropriate practices within the vicinity of known significant cultural sites.

**Action sta8 (Phase 1)** **Provide mandatory training for** all appropriate SFPUC staff to become familiar with **this Watershed Management Plan** and the procedures required to carry out their particular duties.

**Action sta9 (Phase 1)** **Train** selected staff and docents **to provide meaningful interpretation** of watershed resources and to assist with community outreach to schools and interest groups.

## **Fire Management and Emergency Response Training**

**Action sta10 (Phase 1) Provide fire-related training** to selected staff members. Include as part of the training the following:

- A. Incident Command System training courses.
- B. Suppression skills.
- C. Landowner/decision-maker roles in fire suppression.
- D. Preparation and execution of prescribed burns.
- E. Plant identification and ecology of local species.

**Action sta11 (Phase 1)** Establish an **employee training program for safety and emergency response** procedures, coordinated with emergency response drills (Action saf8)



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## 5.18 Fiscal Framework (fic)

Adequate funding is crucial to the implementation of watershed maintenance and monitoring activities by the SFPUC, and therefore critical to the long-term viability of the watershed as a feasible and high quality water supply source. The actions presented in this section focus not only on funding sources, but on the costs and subsequent benefits of existing and future activities, as well as potential opportunities for the SFPUC to purchase lands and easements within the greater watershed that are owned by entities other than the SFPUC. Actions pertaining to the fiscal evaluation of existing and future operations and maintenance are intended to yield new opportunities for cost savings and/or increased efficiency for the continued implementation of these important management strategies.

The management actions for fiscal framework provided in this section are divided into the following topics:

- Costs and Benefits of Watershed Activities
- Lease and Permit Fees
- Watershed Management Funding
- Funding Sources
- Acquisition of Watershed Lands
- Fines

Additional actions related to the fiscal framework but more appropriately addressed in other sections include:

- staffing and training needs (Section 5.17: Staffing and Training).

### Costs and Benefits of Watershed Activities

**Action fic1 (Phase 2) Evaluate costs and benefits** related to leasing, permitting, and public access activities on the watershed prior to allowing these activities to occur. The evaluation should include:

- A. Direct costs of administration and management, including: staffing commitment, staff training, equipment and supplies, infrastructure and facilities, physical improvements to the land, provision of water, and other “soft” resources.
- B. Indirect costs from these activities, including: adverse impacts to water quality/supply, ecological resources, cultural resources, scenic quality, and recreation. These costs can be somewhat difficult to quantify; however, one method is to assess the monetary costs of remediation and protection, including: additional water treatment, erosion control, fire control, and monitoring activities.
- C. Direct benefits from generated revenues.
- D. Indirect benefits, including: beneficial physical improvements to the land (e.g., new/expanded wetlands, weed control), fire management/control, public goodwill, and

*“Adequate funding is crucial to the implementation of watershed maintenance and monitoring activities and therefore critical to the long-term viability of the watershed as a high quality water supply source.”*

expanded information and knowledge of watershed resources.

**Action fic2 (Phase 1A)** Continue/authorize or modify/prohibit specific **lease and/or permit activities** based on the results of the lease/permit cost and benefit analysis (fic1). Guidelines include:

- A. Continue existing activities and allow new activities that: (1) produce insignificant impacts to water quality, water supply generated by the watershed, and watershed natural resources; and (2) provide more revenue than they cost to administer and manage or revenue can be raised to this level.
- B. Modify existing activities and prohibit new activities that are found through this analysis to have significant adverse effects to water quality, water supply, and watershed resources, regardless of the amount of revenue generated; or cost more to manage and administer than is provided by the generated revenue.

### **Lease and Permit Fees**

**Action fic3 (Phase 2)** Calculate the **appropriate charges** for lease activities and permit fees using the cost/benefit analysis method discussed under Action fic1.

**Action fic4 (Phase A)** **Modify existing leases and permit fees**, and set future lease and permit fees based on the calculations from Action fic3.

### **Watershed Management Funding**

**Action fic5 (Phase 1A)** **Target funds for watershed management** activities and staff positions according to the following guidelines:

- A. The priorities for watershed activities, staffing, and training set forth in this Plan.
- B. The amount of available funding.
- C. The ability to provide the appropriate level of funding needed to carry out the applicable task.

**Action fic6 (Phase A)** **Evaluate the costs and benefits** associated with specific watershed management activities and tasks **prior to authorization** of funds.

### **Funding Sources**

**Action fic7 (Phase 1B)** **Evaluate alternative sources of funding and implementation** methods for watershed management and monitoring and public use activities on the watershed.

- A. Potential partners and/or sources of funding for both watershed management and monitoring activities and/or public recreation activities include: Federal and State agencies including but not limited to the Environmental Protection Agency, California State Parks and Recreation Department, and CDFG; Alameda and Santa Clara Counties; schools and universities; California Native Plant Society; Audubon Society; and the Sierra Club.

- B. Potential sources of funding for public use activities include: (1) charging user fees; (2) establishing a Watershed Trust Fund; and (3) starting a “Friends of the Watershed” group.
- C. An alternative implementation method is to train volunteers for various activities, including: (1) docent-led tours; (2) trail and general watershed maintenance; (3) watershed security; and (4) simple monitoring activities.

**Acquisition of Watershed Lands**

**Action fic8 (Phase 1) Evaluate** and rank all **lands** within the hydrologic watershed but outside of SFPUC’s landholdings **for potential outright purchase or establishment of easements** of these lands. Guidelines for the ranking system include:

- A. Priority 1: These lands play a major role in water quality and/or continued water supply and are likely to be developed and/or adversely affect water quality. These lands are generally located in High WQVZs. Formulate aggressive measures to purchase Priority 1 lands outright or purchase conservation easements.
- B. Priority 2: These lands have a significant overall role in the health of the watershed or facilitate better and more effective management of the watershed. These lands are generally located within Moderate WQVZs or high ecological, fire, or

landslide sensitivity zones. Formulate measures to purchase Priority 2 lands outright or purchase conservation easements after Priority 1 lands/easements have been purchased or when available, and if practical.

- C. Priority 3: These lands have a secondary overall role in the health of the watershed and/or facilitate better and more effective management of the watershed. These lands are generally located in Low WQVZs or moderate ecological, fire, or landslide sensitive zones. Purchase Priority 3 lands outright or purchase conservation easements only after Priority 1 and Priority 2 lands/easements have been purchased or when available, and if practical.
- D. Priority 4: Do not purchase land or protection/conservation easements on lands that have only a minor role in the health of the watershed, or are otherwise unavailable.

**Action fic9 (Phase 1A) Coordinate** with upstream land owners to develop and place a **natural and cultural resources conservation easement** over non-SFPUC owned watershed lands in coordination with CDFG, Alameda and Santa Clara Counties, and other agencies, as applicable to protect the watershed from future development and activities which may endanger the SFPUC’s ability to protect water quality. This easement shall be in keeping with the policies and actions of this Plan and should stipulate that the watershed

be maintained substantially in its natural state and devoted to the collection, storage, and transmission of water and protection of water quality for human consumption, which is compatible with preserving the watershed in its present state as open space land.

### **Fines**

**Action fic10 (Phase 1)** In coordination with the Bureau of Commercial Land Management, Bureau of Finance develop and implement a **schedule of fines and/or penalties for failure to meet lease requirements** which are related to water quality and/or resource protection.



## 5.19 Information Management (inf)

The internal maintenance of information as well as its dissemination to the general public, relevant agencies, and inter-SFPUC communication are important parts of effective watershed management. Information related to the location of sensitive species, fault zones, areas of slope instability, water quality data, cultural resources, and corresponding restrictions for use and/or required maintenance activities should be managed in such a way to be feasible, easily retrievable, and as efficient as possible. The actions presented below are focused on achieving this for external and internal (i.e., SFPUC) transmission of information.

The management actions for information management provided in this section are divided into the following topics:

- Watershed Natural Resources Center
- GIS Operations and Database Maintenance
- Watershed Web Page Maintenance
- Coordination and Collaboration

Additional actions related to information management but more appropriately addressed in other sections include:

- actions related to regional coordination of resource databases (Section 5.16: Public and Agency Outreach); and
- actions related to data generated as a result of ongoing monitoring and survey efforts and actions related to querying the GIS database regarding resource sensitivity prior to new activities (Section 5.9: Vegetation, Soil, and Pest Management; Section 5.10: Wildlife; Section 5.11: Aquatic Zone Protection; Section 5.12: Fishery Resources; and Section 5.13: Cultural Resources).

### Watershed Natural Resources Center

**Action inf1 (Phase 2) Establish and staff a Watershed Natural Resources Center** for use by SFPUC staff and other interested individuals and groups to house information (e.g., applicable documents, surveys, reports, and studies) pertaining to both the Alameda and Peninsula Watersheds. Guidelines include:

- A. Appoint a resource center librarian responsible for coordinating the materials available at the center.
- B. Locate the center in a central location (e.g., Millbrae headquarters).
- C. Develop and make available standard procedures that allow staff, researchers, docents, and volunteers the opportunity to provide information to be maintained at the Watershed Resource Center.



*GIS operations*

*“The internal maintenance of information and its dissemination to the public, agencies, and SFPUC divisions are important parts of effective watershed management.”*

### GIS Operations and Database Maintenance

**Action inf2 (Phase 1)** Assign GIS database operations and maintenance duties to a qualified **GIS technician** responsible for all resource updates and queries.

**Action inf3 (Phase A)** As new natural, cultural, and other resource data and findings become known, enter data into the **SFPUC GIS database** using standard entries for data source, ID code, type, name, date, status, description, and sensitivity. Information to be updated includes:

- A. Fault zones.
- B. Seismic hazards.
- C. Slope stability.
- D. Archeologic and historic sites and features.
- E. Water quality data and monitoring.
- F. Sensitive, rare, threatened, and endangered species and habitat data.
- G. Fisheries information.
- H. Vegetation.

- I. Vegetation management activities (action veg1).

**Action inf4 (Phase A)** Prior to any operations and maintenance and/or construction activities, **request a database check** from the watershed GIS technician for any known sensitive ecological or cultural resources or areas within the vicinity of the proposed activity.

### Watershed Web Page Maintenance

**Action inf5 (Phase 1)** Assign the duties of maintaining and **updating the watershed web page** to an LRMS staff member trained in web page maintenance.

### Coordination and Collaboration

**Action inf6 (Phase A)** **Disseminate and acquire all significant information** (GIS and otherwise) to and from applicable agencies and local and regional databases (e.g., California Natural Diversity Database). 

## 5.20 Design and Construction Requirements (des)

All new construction activities within the watershed have the potential to degrade water quality and quantity, disturb ecological and cultural resources, and affect the scenic or historic value of the surroundings. The actions presented below set forth requirements for the design and construction of any new facilities and the modification of existing facilities, and are intended to minimize and avoid wherever possible these potential effects.

The management actions for design and construction requirements provided in this section are divided into the following topics:

- Review Process for Proposed Plans and Projects
- Construction Fencing
- Design Guidelines
- Accessibility Compliance

Additional actions related to design and construction requirements but more appropriately addressed in other sections include:

- actions related to easements prior to new activities to ensure that watershed resources will not be harmed by new activities or construction (Section 5.9: Vegetation, Soil, and Pest Management; Section 5.10: Wildlife; Section 5.11: Aquatic Zone Protection; Section 5.12: Fishery Resources; and Section 5.13: Cultural Resources);

- GIS database query for sensitive resources prior to new construction (Section 5.19: Information Management); and
- actions related to signage guidelines (Section 5.16: Public and Agency Outreach).

### Review Process for Proposed Plans and Projects

**Action des1 (Phase 1A)** When a proposed plan or project is first presented to the SFPUC for consideration, prior to its detailed design or development, the Proposed Projects Review Coordinator (Action des3) should meet with the project proponent and identify for them the **requirements of the Watershed Management Plan** which must be met by that project or plan. LRMS staff may also develop specific criteria, as necessary, for project performance.

**Action des2 (Phase 1A)** To determine whether or not a proposed plan or project is compatible with the Watershed Management Plan goals and policies, all proposed plans and projects must be evaluated as part of the Review Process for Proposed Plans and Projects (see Figure 4-1) using the **Watershed Goals and Policies Compliance Checklist**. A sample checklist is included in Figure 5-1. LRMS staff will be responsible for completing the checklist and making recommendations to the

*“Construction activities within the watershed have the potential to degrade water quality and quantity, disturb ecological and cultural resources, and affect the scenic or historic value of the surroundings.”*

SFPUC. The SFPUC will be responsible for making both a preliminary and final determination as to whether a particular plan or project is compatible with the goals and policies of the watershed management plan.

The preliminary review should involve development of conceptual plans providing enough detail for the LRMS staff to make a recommendation to the SFPUC as to whether the project should proceed to the detailed design phase.

The final review should include the detailed plans outlined below to provide sufficient detail for LRMS staff to recommend to the SFPUC as to whether the project should proceed through the environmental review process. The project proponent must provide all applicable plans to the SFPUC so that the final review can be conducted. Plans should include, at a minimum and as applicable, the following:

- A. A map of the site, at a scale of 1 inch = 500 feet or greater with 5-foot contour intervals or greater, showing pre-development land grades and final land grades; all structures and site improvements as applicable;
- B. Elevation drawings of the site showing pre- and post-development appearance;
- C. Descriptions of the proposed use;
- D. Description of the drainage/erosion control features to be employed;
- E. A landscaping plan, indicating the species, number, size, and location of plantings, as well as a description of irrigation provisions or other measures necessary to ensure the survival of plantings; and
- F. An estimate of the required parking demand and a parking layout sufficient to accommodate projected demand.
- G. Other plans as required by SFPUC staff.

**Action des2.1 (Phase A)** Prior to the approval of any lease permit, or activity involving construction or the introduction of additional people into the watershed, conduct a **carrying capacity analysis** to determine if the level of activity proposed is appropriate to the resources of the site(s) being considered. Redesign, relocate, or reject the proposal as appropriate.

**Action des2.2 (Phase A)** Prior to the approval of construction of any new facility or structure, within the watershed but outside of an Alquist-Priolo Earthquake Zone, require appropriate geotechnical evaluations to assure that the structure can withstand the effects of a seismic event. If the facility or structure is intended for human occupancy and sited over active fault traces, design and construction should comply with the policies and provisions of the Alquist-Priolo Fault Hazard Act.

**Action des3 (Phase 1)** Assign an LRMS staff member to be the **Proposed**

Project						● Sure	
Staff Reviewer				Date:			○ Unsure
Not							
Watershed Management Goal or Policy	Exceeds	Consistent	Consistent	NA	Remarks		
<b>Water Quality</b>							
<i>Goal: Maintain and Improve Source Water Quality to Protect Public Health and Safety</i>	○	●					
WQ1 Prevent the introduction of pesticides, herbicides, and rodenticides into the water supply by minimizing and controlling the use of these constituents, and implementing alternative .....		○					
WQ2 .....		●					
WQ3 .....							
<b>Water Supply (WS)</b>							
<i>Goal: Maximize Water Supply</i>			○				
WS1 Maximize reservoir storage capacities by minimizing sedimentation in reservoirs.			○				
WS2.....			○				
<b>Vegetation (V)</b>							
<i>Goal: Preserve and Enhance the Ecological and Cultural Resources of the Watershed</i>	●						
V1 Manage an IPM program to restrict and, where possible, eliminate the use of chemical applications....	●						
V2 .....	●						
<b>Wildlife (W)</b>							
<i>Goal: Preserve and enhance the Ecological and Cultural Resources of the Watershed.</i>	●						
W1 Protect high Ecological Sensitivity Zones (ESZs), including host plant communities supporting populations of State and Federally listed animals, using sound scientific methods.	●						
W2 .....		●					
<b>Aquatic Resources (AR)</b>							
<i>Goal: Preserve and enhance the Ecological and Cultural Resources of the Watershed.</i>			●				
AR1 Conserve, protect, and enhance the biodiversity, genetic integrity, and habitat of the watersheds aquatic resources.		○					

Figure 5-1: Sample Watershed Goals and Policies Compliance Checklist

**Projects Review Coordinator** to oversee the Review Process for Proposed Plans and Projects as set forth in Policy WA19 and Action des1.

### **Construction Fencing**

**Action des4 (Phase A)** Prior to the initiation of any new construction, or renovation/alteration of existing facilities or structures, **construct perimeter fencing**, using metal posts with orange snow fencing for visibility, around the entire construction zone to enclose all construction-related activities and protect natural and cultural resources outside the zone from damage. In addition, any sensitive resources within the fenced construction zone or adjacent to the transportation corridors leading to the fenced construction zone shall be enclosed with similar fencing. Locations or sensitive species enclosures shall be identified by LRMS staff.

### **Design Guidelines**

**Action des5 (Phase A)** Prior to approval of new construction activities or renovation/alteration of existing facilities, structures, or roads, ensure that the following **design guidelines** are met:

- A. Where grading is necessary, slopes and landforms shall be contoured to mimic the surrounding environment as much as possible.
- B. Design and site new roads and trails to minimize grading and the visibility of cut banks and fill slopes.

- C. Overpasses, safety and directional signs, and other road and highway structures may protrude above a skyline only when it can be demonstrated that: the facility is necessary for public service and safety, the break in the skyline is seen only in the foreground, and the break in the skyline is at a minimum necessary to provide the required service.
- D. Incorporate architectural siting/design elements that are compatible with the applicable surroundings (i.e., style, scale, form, texture, color).
- E. Eliminate, wherever possible, the use of unpainted metallic surfaces and other sources that may cause increased levels of reflectivity.
- F. Exterior lighting shall be directed downward and sighted and shielded such that it is not highly visible or obtrusive.
- G. The silhouette of new structures shall remain below the skyline of bluffs, cliffs or ridges.
- H. Design any new structural additions to historic structures to harmonize with older structural features and comply with scenic easements and aesthetic guidelines.
- I. Encourage the salvage and selective re-use of building features if historic structures are demolished.

### **Accessibility Compliance**

**Action des6 (Phase A)** Prior to the design and construction of new facilities and trails, ensure **compliance with all**

**legally mandated accessibility standards.**

**Action des7 (Phase 1) Establish a universal access program** to address all watershed facilities and trails by undertaking the following actions:

- A. Train an appropriate number of SFPUC employees that strive to achieve and maintain barrier free accessibility at SFPUC facilities and areas open for public use.
- B. Perform an accessibility review of all existing trails, facilities, and programs for compliance with legally mandated accessibility standards.
- C. Establish priorities to bring existing trails, facilities, and programs into compliance with legally mandated accessibility standards.
- D. Require and design all new trails and facilities to comply with legally mandated accessibility standards.

**Action des8 (Phase 2)** Using the priorities established in Action des7 (above), implement **universal access improvements** at SFPUC facilities and trails.

**Air Quality Protection**

**Action des9 (Phase A)** Ensure that a **dust abatement program** is implemented as part of all construction projects. The program should incorporate Bay Area Air Quality Management District recommended BMPs to reduce

construction-related dust emissions. Guidelines include:

- A. Water all active construction areas at least twice daily
- B. Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least two feet of freeboard.
- C. Pave, apply water three times daily, or apply non-toxic soil stabilizers on all construction related unpaved access roads, parking areas, and construction staging areas.
- D. Sweep all paved access roads, parking areas, and staging areas at construction sites daily with water sweepers.
- E. Sweep adjacent public streets daily with water sweepers if visible soil material is carried onto adjacent public streets.
- F. Hydroseed or apply non-toxic soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- G. Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc).
- H. Limit traffic speeds on unpaved roads to 15 miles per hour.
- I. Install sandbags or other erosion-control measures to prevent silt runoff to public roadways.
- J. Re-vegetate disturbed areas as quickly as possible with native vegetation.



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## 5.21 Sunol Valley (sun)

The Sunol Valley consists of approximately 1,350 acres and is bounded generally by Paloma Way and Niles Canyon Road to the north, Calaveras Road to the east, the Sunol WTP on the south, and Alameda Creek on the west. These lands are located within the secondary watershed. The planning area is generally divided into two areas—the lands north of I-680 and lands south of I-680.

SFPUC owns most of the land within the Sunol Valley and currently leases most of it for a variety of ongoing activities including: gravel extraction (by permit from Alameda County and lease from SFPUC), agricultural activities and plant nurseries, and recreation (the EPRPD Sunol Regional Wilderness). SFPUC activities and operations in the Sunol Valley include the Sunol Water Temple, SFPUC east bay operations facilities, the Hetch Hetchy Aqueduct, and the Sunol WTP. The future functions of the Sunol Valley are envisioned to include potable and non-potable water storage, water quality protection, water release and recapture facilities, Sunol WTP operations and support facilities, gravel operations and other revenue-generating activities, Alameda operations facilities, natural and cultural resources, fisheries enhancement, and potential recreation resources.

To optimize water storage for SFPUC (thus increasing the yield and reliabil-

ity of the water supply) and to address the complex mix of activities in the Sunol Valley, the Sunol Valley Resources Management Element (Sunol Valley Element) was prepared (and is provided in Appendix A-3). The Sunol Valley Element addresses the existing and future functions of the Sunol Valley in a coordinated manner and strives to minimize conflicts between these functions. All activities in the Sunol Valley are intended to be compatible with the goals and policies of the Alameda Watershed Management Plan set forth in Chapter 4.

The Sunol Valley Resources Management Element provides a conceptual program for the future of the entire valley. In general, this program allows for the completion of existing permitted mining and reclaims the mined pits for water storage. Specifically, north of I-680, this program calls for completing mining of the existing permitted areas (SMP-32), with mining to be completed by approximately 2035. Upon completion of mining, one water storage pit with 16,100 acre-feet (AF) of storage would remain in this area. Total mining revenue is estimated to be \$22.7 million (1997 dollars). Restoration and landscaping of a ¼-mile buffer zone surrounding the water storage pit would also be completed.



*Sunol Valley Quarries*

South of I-680, two options are included in the conceptual program. Option 1 (Action sun2a) calls for some expansion of mining, which would require amendment of existing permits and leases. Mining is intended to be completed by 2021 and would provide 47,100 AF of water storage in five pits. Total mining revenue is estimated to be \$45 million (1997 dollars). Other activities south of I-680 in Option 1 (Action sun2a) may include:

- commercial site;
- overnight nature study south of the Hetch Hetchy Aqueduct; and
- trail connections to the Sunol Regional Wilderness (EBRPD).

Option 2 (Action sun2b) calls for gravel extraction within the currently permitted areas to a depth of 200 feet. Under this option, mining would be completed by approximately 2014. Total water storage would be 38,800 AF in four pits with total estimated revenue of \$32.7 million (1997 dollars). Other activities south of I-680 in Option 2 (Action sun2b) may include:

- commercial site;
- overnight nature study south of the Hetch Hetchy Aqueduct; and
- trail connections to the Sunol Regional Wilderness (EBRPD).

Management actions and guidelines that pertain to the Sunol Valley fall into the following categories:

- Gravel Mineral Resources
- Reservoir Design Considerations

- Reservoir Operations
- Water Quality Monitoring
- SFPUC Facilities
- Recreation And Other Activities
- Economic Resources

Sunol Valley actions and guidelines are identified below. For additional information please refer to the Sunol Valley Resources Management Element.

Additional actions related to the Sunol Valley but more appropriately addressed in other sections include:

- lease requirements and the preparation of reclamation plans prior to the approval of new sand and gravel leases (Section 5.15: Lease and Permit Requirements);
- design guidelines and accessibility compliance (Section 5.20: Design and Construction Requirements); and
- establishment of a Watershed Visitor and Education Center (Section 5.16: Public and Agency Outreach).

### **Gravel Mineral Resources**

#### *North of I-680*

**Action sun1 (Phase 3) Mine the existing permitted areas in accordance with SMP-32** with completion of mining by 2035. Prior to completion of mining, backfill the area adjacent to the Sunol Water Temple to provide a ¼-mile buffer area as additional mitigation for the visual and cultural resource impacts of SMP-32 on the temple area. Total wa-

ter storage in this pit should be 16,100 AF once backfilling is complete.

*South of I-680*

**Action sun2a (Phase 1) (Option 1)** To maximize water storage following the completion of mining, work with Alameda County to **amend the existing mining permits south of I-680** to achieve a maximum mining depth of 200 feet and a maximum mining footprint.

**Action sun2b (Phase 1) (Option 2)** To provide increased water storage following the completion of mining, work with Alameda County to **amend the existing mining permits south of I-680** to increase the mining depth of existing permitted areas to 200 feet.

**Reservoir Design Considerations**

**Action sun3 (Phase 3)** Upon completion of mining and in preparation of the quarry pits for water storage, **design the reservoirs** to meet the following guidelines for maintaining high water quality:

- A. Reservoirs should be piped directly to the Sunol WTP or to San Antonio Reservoir from each pit rather than piped through other pits.
- B. Include multiple port inlet and outlet towers for flexibility in modifying reservoir water quality.
- C. Maintain steep reservoir slopes wherever possible to reduce macrophyte growth (vegetation in the res-

ervoirs). Exceptions to this are areas where human activity is expected and steep sideslopes cause safety concerns.

- D. Plant trees to provide a barrier to airborne particulate contaminants between proximate reservoirs and I-680.
- E. Maintain cutoff slurry walls constructed during mining.

**Action sun4 (Phase 3A)** Due to the change in gradient of the valley floor, **create sideslopes** on the pits such that there is a gradual transition to water (e.g., a beach with slope of 12:1) rather than a drop to water at the uphill edge of each pit. Where construction of beaches is not possible, construct attractive fencing to keep people from falling in.

**Action sun5 (Phase 3A)** Reclaim quarries with **sideslopes** appropriate to their proposed activity. Guidelines for activities and sideslopes are as follows:

- A. Areas intended for human activity such as fishing and boating should be designed with a sideslope of 12:1.
- B. Under normal operating conditions (i.e., non-drought or emergency conditions), land adjacent to the water’s edge where human activity is expected to be less intense should be contoured to 12:1 for safety reasons but, maximize storage, may drop off rapidly to between 1.5:1

*“This process optimizes water storage thus increasing the yield and reliability of the water supply.”*

and 2:1 depending on geotechnical and slope conditions.

### Reservoir Operations

**Action sun6 (Phase 3B)** To maintain water quality during normal operations (i.e., during periods of non-emergency use), **operate the Sunol Valley reservoirs** according to the following guidelines:

- A. Operate the reservoirs so the water is piped directly to the treatment plant from each pit.
- B. Minimize bank erosion caused by fluctuating water levels and the disruption of sediment by incoming water during initial filling and during refilling following a withdrawal.
- C. Replace evaporation losses annually (anticipated to be approximately 2,300 AF/yr).
- D. Monitor water quality and withdraw water from the depth that provides the highest quality.
- E. Annually remove macrophyte growth to reduce total organic carbon (TOC)
- F. The reservoir used for fishing should be managed to favor predatory fish and minimize populations of planktivorous fish.
- G. Public access reservoirs should have controls to minimize the introduction of pathogens to the reservoirs. Prohibit body contact recreation.
- H. The use of copper sulfate for algae control should be avoided, but if needed should be added at the minimum effective dosage.

**Action sun7 (Phase 3A)** For safety reasons, **suspend public access** to any reservoir in the Sunol Valley, which allow public access when the reservoirs are drawn down due to drought or other emergency situation.

### Water Quality Monitoring

**Action sun8 (Phase 3B)** As the reservoirs are filled, **collect water quality data** from the influent water. This analysis should include information on phosphorus, nitrogen, and metals, as well as the more typical parameters such as TOC and suspended solids.

**Action sun9 (Phase 3B)** Once the reservoirs are full, a **sampling program** should be followed that includes intensive sampling for the first year to identify the types and timing of water quality changes that occur. The sampling program should follow the guidelines below.

- A. Sampling efforts should focus on suspected problems. For instance, a depth profile of dissolved oxygen, iron, and manganese concentrations will be important during the summer, while more frequent temperature profiles should be taken in the fall as the reservoir turns over.
- B. Because each reservoir will have the flexibility to supply water from several depths, the monitoring program should identify the location of the highest quality water at any given time. If the reservoirs are well-characterized, it should not be nec-

essary to manage the reservoirs to provide the highest quality water at all points at all times. For example, if algae and the associated taste and odor problems are controlled but artificial circulation is not adequate to eliminate anoxic conditions within a reservoir, water can be drawn from the epilimnion where metal concentrations are lower.

### SFPUC Facilities

**Action sun10 (Phase 2)** Retain the existing **Sunol maintenance facility** as the base for East Bay operations with the following **improvements**:

- A. Replace or upgrade:
  - Maintenance Garage
  - Trade shops and office to include crew and supervisors facilities sized for four crews plus supervisors
  - Equipment storage shelter sized for heavy equipment, trucks, and other miscellaneous equipment
  - Fueling facility
  - Warehouse and storage yard for storing construction and miscellaneous materials
  - Combination Watershed Office and Watershed Visitor Education Center including:
    - four offices
    - one large conference room
    - two small meeting rooms for daily meetings with watershed staff

- file/map room.

- B. Reconfigure parking and prepare auto circulation plan.
- C. Improve security and fencing including lighting.

### Recreation and Other Activities

#### *North of I-680*

**Action sun11 (Phase 3A)** Following completion of mining the module closest to the Sunol Temple, **backfill and landscape a ¼-mile buffer zone** surrounding the water temple.

**Action sun12 (Phase 1)** Prepare a **conceptual Landscape and Recreation Plan**, as required by SMP-32, for the restoration and public use of the Sunol Water Temple, its environs, and historic entry.

**Action sun13 (Phase 2)** **Restore the historic entry** to the Sunol Water Temple along Paloma Way as part of the Landscape and Recreation Plan required by SMP-32. Guidelines include:

- A. Enhance the view to the temple.
- B. Line the corridor with orchard-like planting.
- C. Use native California landscape materials, where possible.

**Action sun14 (Phase 2)** **Develop a public recreation area** around the Sunol Water Temple, as part of the Landscape and Recreation Plan required by SMP-32. This area should be developed according to the following guidelines:

- A. Establish an interpretive center or area for interpretation of the Sunol Water Temple and the various archeological sites in the vicinity. Use this venue to inform and educate the public about water, and natural and cultural resources within the Sunol Valley as well as watershed wide.
- B. Establish a picnic and day-use area which may include picnic tables and barbecue facilities.
- C. Establish an events area with a small amphitheater, a group picnic area, and parking.
- D. Adjacent to Alameda Creek, establish a creek enhancement and wildlife area. In conjunction with this include a short nature/interpretive trail through the wildlife area and trail connections to Niles Canyon and Pleasanton Ridge Regional Parks; include a staging area for these trails.
- E. Provide linkages to the trail system south of I-680.

**Action sun15 (Phase A) Prior to the design** of any new or alteration of any existing public access trails, ensure that the following **access and safety guidelines** are met:

- A. Consider public needs for convenience, access, and security when designing and siting trails and trailheads.
- B. Consider use-levels on existing trails and projected demand for different trail uses.

- C. Minimize user conflicts on trails through proper siting, design, maintenance, and an aggressive user safety program.

**Action sun16 (Phase 3) Explore the feasibility** of developing one or more of the following adjacent to the water storage pit and/or adjacent to Alameda Creek along Niles Canyon Road: a working farm, a vineyard, nurseries, row crops, aquaculture, and/or wetlands.

**Action sun17 (Phase 3A) To provide for universal access**, construct and operate the recreation facilities and activities following the guidelines pertaining to accessibility for disabled persons (see Action des7).

**Action sun18 (Phase 3B) Conduct periodic maintenance**, as needed, on the **Sunol Water Temple** such that deterioration and alteration are avoided.

*South of I-680*

**Action sun19 (Phase 3) Establish a small commercial site** near the intersection of I-680 and Route 84 to provide limited supplies for visitors using the recreation facilities north of I-680 and the overnight nature study area.

**Action sun20 (Phase 3) Establish an overnight nature study area** located in the Sunol Valley south of the Hetch Hetchy Aqueduct to provide educational programs for school children.

**Action sun21 (Phase 3) Establish trail connections** extending to the Sunol Regional Wilderness and also link with the trail connections established north of I-680.

### **Economic Resources**

**Action sun22 (Phase 3A) Contract with a concessionaire**, proven to be competent in the development and management of recreation facilities, to construct and operate the Sunol Valley recreation facilities so that the costs are not incurred by the rate payers. 

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## 5.22 Grazing Management (gra)

Grazing of livestock on Alameda watershed lands provides potential management strategies for controlling fire hazard and maintaining the general health of the land. This activity also generates revenue for the SFPUC. Fire management benefits from grazing include reducing the amount of available fuel and heavy brush that would otherwise build up over time. Proper management and control of grazing, however, are critical to reducing the potential adverse environmental effects commonly associated with this activity (e.g., water quality degradation and the pathogen *cryptosporidium*, increased erosion, disturbance of native vegetation, and displacement of wildlife).

To address the issue of grazing and provide strategies to appropriately manage grazing on the watershed, the Alameda Creek Watershed Grazing Resources Management Element (Grazing Element) was prepared and is provided in its entirety in Appendix A-2. The SFPUC used the following documents in the development of the Grazing Element: (1) the *Hazard Analysis of Critical Control Points (HACCP)-Based Program to Control Cryptosporidium and other Waterborne Pathogens in the Alameda Watershed*, prepared by the Alameda County Resource Conservation District; (2) the *Alameda Watershed Summary of Meetings, Technical Review and Stakeholders Comments, March-*

*April 1997*, which documents the extensive public participation process associated with preparation of the HACCP plan; and (3) the October 1995 *Draft Alameda Watershed Range Management Plan*, which was initially developed to address grazing on the Alameda Creek Watershed. The HACCP-Based Program and the Summary of Meetings documents are also included in Appendix A, Volume I, A-2 and Volume III, A-7, respectively.

The grazing management actions listed below were derived from and are described in further detail in the Grazing Element. They provide methods the SFPUC will follow to effectively manage and contain grazing activities so that the beneficial aspects related to fire management can be realized without jeopardizing water quality/quantity and biological resources.

The Alameda Creek watershed was subdivided into three geographic watershed protection areas: the San Antonio, Calaveras, and Lower Alameda Creek Watershed Protection Areas. This was done to prioritize areas to be addressed, to identify details required to manage each area, and to identify improvements for each area. Figures provided in the Grazing Element identify the three watershed protection areas and the locations and types of improvements required. Tables in the Grazing Element



*Lands Leased for Grazing*

identify watershed protection improvements for each watershed protection area and estimated types, quantities, and costs of these improvements. Actions gra6, 7, and 8, respectively, identify required improvements to these areas.

The management actions for grazing provided in this section are divided into the following topics:

- Grazing Management Strategy
- Grazing Lease Strategy
- Watershed Protection Areas and Improvements
- Watershed Monitoring
- Funding of Improvements

The actions listed below summarize the actions set forth in the Grazing Element; the reader is referred to the Grazing Element for a complete description of the activities proposed for each of these five categories.

Additional actions related to grazing management but more appropriately addressed in other sections include actions related to wildlife movement (Section 5.10: Wildlife), to establishment of water quality monitoring programs for lessees (Section 5.15: Lease and Permit Requirements), and to fines/penalties for failure to comply with lease requirements (Section 5.18: Fiscal Framework).

### **Grazing Management Strategy**

**Action gra1 (Phase 1)** Implement **grazing management controls** to: (1) reduce

the risk of viable pathogen discharges into watershed streams and reservoirs by enhancing the health of the riparian zones and reservoir margins; and (2) maintain and improve ecological resources in other areas of the watershed by ensuring that vegetation growth will be kept under control. Guidelines required in the implementation of the grazing management controls include:

- A. Cattle utilization defined in terms of AUMs reduced by at least 40 percent of pre-1991 stocking levels.
- B. A grazing lease fee payment structure based on AUMs. In no case will fees for grazing leases be based on a price per acre.
- C. A lease requirement that sets the target Residual Dry Matter (RDM) forage level on September 1 annually at 1,000 lbs. per acre. At no time shall RDM levels on any portion of the watershed drop below 800 lbs. per acre.
- D. A lease requirement for preparation and approval of an Annual Operating Plan, including a herd health component, by October 1 annually.
- E. A lease requirement of a restricted calving period limited to August through October annually. Calving must be 80 percent complete by September 30 and 100 percent complete by October 31.
- F. Immediate consolidation of smaller existing leasehold areas into larger and more economically efficient grazing units. Some inefficient parcels may be identified as non-es-

essential for SFPUC watershed protection.

**Action gra2 (Phase 1)** Implement **structural protection measures** to: (1) reduce the risk of viable pathogen discharges into watershed streams and reservoirs by enhancing the health of the riparian zones and reservoir margins; and (2) maintain and improve ecological resources in other areas of the watershed by ensuring that vegetation growth will be kept under control. Requirements for implementing the structural protection measures include the following:

- A. Strategically placed fencing around reservoirs and streams restricting all cattle access, and around riparian pastures restricting access by calves. Fencing shall be provided to restrict access by cattle to these areas while at the same time providing for adequate wildlife access, and decreasing the potential for established cattle trails. Such trails eventually become erosion channels. Fencing to restrict cattle from these areas shall be constructed using barb wire with top wire not more than 42 inches above the ground and smooth bottom wire at least 18 inches above the ground.
- B. Fence stock water ponds on key watercourses to prevent direct access by cattle. Modify existing and construct new troughs and other livestock water improvements to include ramps or ladders to prevent inadvertent drowning of wildlife.

- C. Watershed protection areas open to general grazing by cows and calves. These areas are to be developed intensively with water collection and distribution improvements to disperse cattle uniformly away from riparian pastures and achieve uniform utilization of available forage throughout the area.
- D. Development of off-stream cattle and wildlife water improvements to disperse deer, elk, and feral pigs away from key watercourses and sensitive riparian pastures.

**Action gra3 (Phase 2)** Evaluate the feasibility and potential benefits of **different types** or classes of **livestock** for achieving fuel reduction goals. Sheep, for example, are often managed with permanent herders and dogs, allowing better distribution and control. Goats are better suited than cattle for woody fuel reduction. Goats are useful for reducing ladder fuels and heavy brush near sensitive resources or residential areas subject to high fire hazard conditions.

**Grazing Lease Strategy**

**Action gra4 (Phase 1)** Implement specific criteria for **lessee selection**; requirements for the selection of lessees include:

- A. Interested parties may consist of an individual, corporation, partnership, or trust. Legal documentation will be required for proof of business structure.

*“These methods allow effective management and containment of grazing activities so that the beneficial aspects related to fire management can be realized without jeopardizing water quality/ quantity and biological resources.”*

- B. Interested parties will submit a resume and summary of operations conducted. Information should include the scope and location of historical and current operating units. The information should be in narrative form and may be supported by photographs, maps, and other documentation that provides evidence of management experience.
- C. At a minimum, each potential lessee will address areas of resource operation and management experience including, but not limited to:
- rangeland improvements (fencing, corrals, vegetation enhancement);
  - water resources development (springs, stock ponds, wells);
  - range utilization methods (pasture rotation, water distribution, salt distribution);
  - conventional pest control (rodent control, thistle control, application methods);
  - integrated pest management;
  - fire hazard reduction practices;
  - protection, enhancement, and management of riparian areas;
  - range monitoring practices;
  - supplemental feeding practices;
  - erosion control practices; and
  - herd health management practices.
- D. Interested parties will submit a current and signed financial statement (Asset:Liability Balance Sheet) for any and all entities and/or individuals that will be signatory to the lease(s).
- E. Interested parties will submit letters of reference from current and recent (last three years) landlords of grazing and other agricultural lease holdings, if applicable.
- F. Interested parties will submit letters of reference from financial institutions of current or recent agri-business transactions.

**Action gra5 (Phase 1)** Implement a set of **lease requirements and terms** to establish stocking rate requirements, annual operating plans, water quality protection measures, timing of calving, staffing requirements, fee structure, and specific lease terms. The following lease requirements and terms must be adhered to:

- A. **Base Level Stocking Rates and Requirements** — All grazing units will be leased on an AUM basis, both in terms of stocking levels and payment method. No grazing units will be leased on a per acre or other basis. Stocking rates in AUMs for each grazing unit in each watershed protection area are found in Tables 2, 4, and 6 in the Grazing Resources Management Element in the following sections. These are the stocking levels to be allocated for each grazing unit area lease. Each lease will require RDM measurements on or about May 15 to monitor spring forage conditions and RDM measurements for September 1 annually. Each lease will require adjustments

in stocking levels based on interim season (May 15) RDM measurements found to be below that targeted by the Annual Operating Plan (see below).

- B. Annual Operating Plans — Annual Operating Plans will be prepared and submitted by the lessee for each grazing unit by October 1 annually. The annual operating plan will reflect the number of AUMs to be stocked on each grazing unit based on current forage conditions. It will also include an RDM target level for May 15 annually for the AUM specified. The plan will also identify the tenant's season of use, specific watershed improvement requirements, herd health plan, pest control actions, fiscal requirements, verification of security measures including insurance requirements, and pre-approved tenant improvement credits.
- C. Water Quality Protection — Prior to leasing each unit, the water quality protection measures identified as part of the water quality monitoring plan (lea4) for each lease unit must either be completed or a plan for completing them must be identified. These improvements may be completed by SFPUC or the lease may stipulate the improvements the lessee is required to make and identify a timeframe for improvements to be completed. Financing of improvements will be defined on a case-by-case basis as discussed in Funding of Improvements (below).

Water quality protection performance standards will also be incorporated into each lease. Several water quality parameters will be analyzed on a regular basis to identify whether the standards are being met. If the standards are not met, the lease can be terminated.

- D. Timing of Calving — All lessees will be required to time calving between August and October of each year. Calving must be 80 percent complete by September 30 and 100 percent complete by October 31 of each year.
- E. Staffing — Each lessee will be required to maintain an active presence on the property. At a minimum, one full-time staff person will be required on site to manage each grazing unit.
- F. Fee Structure — The payment method for each grazing unit will be based on the number of AUMs allocated to the grazing unit, adjusted as necessary for each annual operating period. Payments may be made on a quarterly basis. The fee may be adjusted quarterly based on adjustments in stocking levels.
- G. Lease Terms — Tenant stability and tenure is vital to a successful grazing program. Initial leases will be for five-year periods. Depending on the results of monitoring (see Watershed Monitoring section below) and favorable measurements of program effectiveness and compliance, future leases may be issued

for up to ten years to provide a stable grazing program.

### **Watershed Protection Areas and Improvements**

**Action gra6 (Phase 1A)** Implement improvements for the **San Antonio Watershed Protection Area**. These improvements are considered the highest priority of the three Alameda Creek Watershed Protection Areas. The area consists of one reservoir, two stream zone buffers, two riparian pastures, and one grazing unit. Improvements for this area included fencing, water developments, water collection systems, stream crossings, wildlife ponds, and stock pond rehabilitation. The Grazing Element provides details on specific improvement locations and costs.

**Action gra7 (Phase 1A)** Implement improvements for the **Calaveras Watershed Protection Area**. These improvements are considered the second priority of the three Alameda Creek Watershed Protection Areas. The area consists of one reservoir and one stream zone buffer, several inaccessible (too steep for cattle) zones, three riparian pastures, and three general grazing units. Improvements for this area included fencing, water developments, water collection systems, stream crossings, wildlife ponds, and stock pond rehabilitation. The Grazing Element provides details on specific improvement locations and costs.

**Action gra8 (Phase 1)** Implement improvements for the **Lower Alameda**

### **Creek Watershed Protection Area.**

These improvements are considered the third and lowest priority of the three Alameda Creek Watershed Protection Areas. There is some water currently utilized for grazing in this portion of the system and greater utilization will be made following completion of a water recapture facility at the head of Sunol Valley, and then with the conversion of some gravel quarries to water storage reservoirs. Consequently, this will be the last area where the requirements described in the Grazing Element will be implemented. The area consists of one extensive stream zone buffer and two lesser ones, two inaccessible (too steep for cattle) zones, two riparian pastures, and seven grazing units. Improvements for this area include fencing, water developments, water collection systems, stream crossings, wildlife ponds, and stock pond rehabilitation. The Grazing Element provides details on specific improvement locations and costs.

### **Watershed Monitoring**

**Action gra9 (Phase 1B)** Implement monitoring to ensure verification of completion of or **adherence to program plans and activities**. Guidelines include monitoring to verify:

- A. Development of watershed protection improvements.
- B. Performance of watershed protection improvement maintenance requirements.
- C. Completion and approval of Annual Operating Plans.

- D. Completion of calving by the dates required in the lease.

**Action gra10 (Phase 1B)** Implement monitoring to **assess program(s) effectiveness**. Guidelines include monitoring for:

- A. Water quality.
- B. Measurements of sedimentation production rates.
- C. Auditing of tenant financial conditions.
- D. Changes in vegetative, wildlife habitat and population, threatened and endangered species, and pestilent conditions.

**Funding of Improvements**

**Action gra11 (Phase 1A)** Procure funding for the first phase of improvements (San Antonio Watershed Protection Area) through several **existing watershed protection program funding mechanisms** (i.e., fencing, reservoir protection, watershed protection, and vegetation hazard reduction). Seek funding increases in future budget years through these programs for Phase 2 and 3 improvements (Calaveras and Lower Alameda Watershed Protection Areas, respectively).

**Action gra12 (Phase 1A)** **Apply for funding** of one or more of several State Revolving Fund (SRF) Loans available for source water protection, assessment, and monitoring. Possible SRF Loan sources include the Clean Water Act (CWA) SRF, the newly created Safe Drinking Water

Act (SDWA) SRF to be implemented in 1997, and the Cal-Fed Bay-Delta Funds. Through the use of SRF Loans, the major improvements identified can be funded for construction during the three phases described above.

**Action gra13 (Phase 1A)** **Direct funding to another agency**, such as the Alameda County Resources Conservation District (RCD), for actual installation and construction of the improvements. The advantage of this approach is that the specifications for the types of improvements required are generally available within the resources of the secondary agency. In addition, consolidation of the construction activities under one agency will be more efficient in terms of contract administration and performance.

**Action gra14 (Phase 1)** Identify improvements to be accomplished by the tenants through a **work-credit provision** in the individual leases. This funding method is generally limited to 50 percent of the annual lease fee.



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## Chapter 6. Phasing and Implementation

### 6.1 Introduction

This chapter provides the framework necessary to implement the management actions defined in Chapter 5. Implementation of these actions includes a determination of the phase in which an action should be undertaken and which agencies or individuals (other than SFPUC) are responsible for, or need to be coordinated with, to carry out each action (as applicable). The

management actions, phase of implementation, and coordination responsibilities are summarized in Table 6-1. The table also includes a short description of the management action with key words highlighted in bold type, coordination responsibilities with other responsible agencies/groups, and the applicable section number in Chapter 5 where the actions are described in further detail.

### 6.2 Phasing and Implementation

The Alameda Watershed Management Plan will be implemented over a 20-year timeframe. The Plan will be reviewed and updated periodically, as needed, with a complete review and update of the Plan required at the end of the 20-year time period. The goals and policies of the Plan are fixed; however, the management actions are meant to be revised and updated as necessary, thus providing flexibility with respect to when and how they actually get implemented. Phasing of the management actions is identified by one or more of the following categories:

- (1) within 5 years of plan adoption;
- (2) within 10 years of plan adoption;
- (3) within 20 years of plan adoption;
- and/or
- (A) on an as-needed basis; and

(B) at regular intervals throughout the life of the plan.

Some management actions have been assigned two phasing types, for example, Management Action pub10 is assigned a phase of (2)(A). This action calls for providing (Phase 2) and periodically updating (Phase A) select watershed information on the SFPUC's Internet website. In Phase 2 the select information will be defined and inserted into the website. Thereafter, Phase A will provide the opportunity for updating the website information on an as-needed basis. Similarly, Action saf10, which calls for daily boat patrols of Calaveras and San Antonio Reservoirs to assess emergency situations is a (1)(B) phasing. This indicates that this activity should commence in

Phase 1 and the patrols should continue at regular intervals, in this case daily, throughout the life of the Plan (B).

In general, phasing priorities are related to the ability of an action to help the SFPUC achieve the primary goal — maintaining and improving source water quality. Actions that are most critical to meeting this goal were either assigned to Phase 1 or Phase A. Phase 1 items include many of the fire and road actions as well as staffing and training actions pertaining to watershed safety. The Phase A actions that are essential to meeting the primary goal are those that are required to occur prior to the design and construction of a new facility, initiations of a new activity, or granting of a new lease or permit. Phase A actions critical to meeting plan goals include assuring that the proposed activity meets the goals and policies of the Watershed Management Plan, using the GIS to review watershed resource sensitivity prior to construction approval, protecting the resource during construction, and following Best Management Practices. Phase 2 items are also integral to maintaining and improving water quality but may have less of a far-reaching effect.

Certain Phase 2 actions also are follow-on tasks or monitoring related to actions initiated in Phase 1. Phase 3 tasks, although still very important, are more integral to achieving the other watershed management goals or are actions which are not likely to occur for at least ten years (e.g. implementation of the Sunol Valley water storage facilities).

There are no actions ranked as (B) alone, as these actions are required to occur at regular intervals throughout the life of the Plan. Therefore, a phase was also assigned to initiate these periodic activities.

The information provided in Table 6-1 is to be used in conjunction with the more detailed management actions presented in Chapter 5 and, where applicable, information provided in Plan appendices. For example, for an action related to Fire Management the reader is encouraged to refer back to Chapter 5 for the full description of the management action, then to the Fire Management Element (Appendix A-1) for the complete set of directions required to implement the given action.



**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
<b>Phase 1</b>					
(1)	<b>haz1</b>	Develop <b>hazardous chemical management procedures</b> addressing the type, use, storage, and disposal of hazardous chemicals used in watershed activities.	Lessees	5.3	To Do
(1)	<b>haz4</b>	Conduct regular servicing schedule for SFPUC vehicle fleet and equipment to minimize <b>contaminants</b> (e.g., leaks/drips/spills).	SFPUC Shops Operations	5.3	Ongoing
(1)	<b>haz5</b>	Review and standardize SFPUC <b>boating practices</b> .	Water Quality Bur.	5.3	Ongoing
(1)	<b>haz6</b>	Identify <b>high-risk spill potential areas</b> and implement measures to reduce the risk of hazardous spills.		5.3	Ongoing
(1)	<b>haz7</b>	<b>Develop spill response and containment measures</b> for SFPUC vehicles on the watershed.		5.3	Initiated
(1)	<b>haz7.2</b>	Identify additional <b>hazardous materials clean-up supplies and equipment</b> that the LRMS should purchase.		5.3	To Do
(1)	<b>haz8</b>	<b>Train</b> staff members, as appropriate, in <b>spill response and containment</b> measures for SFPUC vehicles as well as for other types of spills on the watershed.		5.3	Ongoing
(1)	<b>haz9</b>	Maintain a <b>network of hazardous materials clean-up storage lockers</b> at accessible locations on each reservoir and at areas where spill potential is high.		5.3	Ongoing
(1)	<b>roa1</b>	Evaluate, rank the importance of, and implement <b>modifications to the existing road system</b> to reduce erosion and sedimentation.	EBRPD, CDF, Lessees	5.5	To Do
(1)	<b>roa2</b>	<b>Relocate</b> existing <b>high use roads/road segments</b> in proximity to streams that are the primary source of excessive erosion and sedimentation, wherever possible.	CDF, Lessees	5.5	To Do

<sup>1</sup> Phasing of the management actions is identified by one or more of the following categories: (1) Phase 1: within five years of plan adoption, (2) Phase 2: within ten years of plan adoption, (3) Phase 3: within twenty years of plan adoption, and/or: (A) on an As-Needed basis, and (B) at regular intervals throughout the life of the Plan.

**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)	<b>roa3</b>	<b>Modify</b> the grading and drainage of existing <b>high use roads</b> /road segments to reduce the potential for erosion and sedimentation.	CDF Alameda County Santa Clara County	5.5	Ongoing
(1)	<b>roa4</b>	<b>Close and retire (regrade, revegetate, restore) roads</b> not needed for safety or access and minimize problem areas by paving, installing culverts, or other stabilization methods.	CDFG, Lessees Alameda County Santa Clara County	5.5	To Do
(1)	<b>con2</b>	Evaluate the feasibility of, and where possible, <b>use raw untreated water</b> or reclaimed water for roadways, irrigation, sanitation facilities, fire suppression, and other landscape irrigation needs and during construction or earth-moving activities within the Watershed. Continue to use raw, untreated, or reclaimed water at the Sunol Valley Golf Course.	Lessees, EBRPD, CDF Water Quality Bur. Bur. of Commercial Lands	5.6	Ongoing
(1)	<b>fir1</b>	Prior to authorizing the use of any vehicle or equipment on the watershed, require that SFPUC <b>vehicle/equipment comply with the fire prevention regulations</b> established by CDF for use in the watershed.		5.7	Ongoing
(1)	<b>fir2</b>	<b>Install</b> nine <b>dry hydrants</b> at specified locations to reduce the complexity of long-distance water shuttle operations.	CDF, Lessees	5.7	To Do
(1)	<b>fir3</b>	<b>Install</b> and maintain four <b>helispots</b> on SFPUC property at specified locations on the watershed.	CDF, Lessees	5.7	To Do
(1)	<b>fir4</b>	Install and maintain <b>additional helispots</b> at the locations on the watershed.	CDF, Adjacent landowners	5.7	To Do
(1)	<b>fir5</b>	Install <b>additional hydrants</b> off SFPUC lands at specified locations on the watershed.	CDF, Adjacent landowners	5.7	To Do
(1)	<b>fir6</b>	<b>Install</b> one 10,000-gallon <b>water tank</b> and a supporting water collection system at specified location.	CDF	5.7	Initiated
(1)	<b>fir7</b>	Identify and <b>construct necessary road improvements</b> to provide better access to enhance fire suppression capabilities.	CDF County Fire Dept. Alameda County Santa Clara County	5.7	Ongoing

<sup>1</sup> Phasing of the management actions is identified by one or more of the following categories: (1) Phase 1: within five years of plan adoption, (2) Phase 2: within ten years of plan adoption, (3) Phase 3: within twenty years of plan adoption, and/or: (A) on an As-Needed basis, and (B) at regular intervals throughout the life of the Plan.

**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)	<b>fir12</b>	Prepare and provide to affected agencies and organizations <b>maps and information</b> showing water quality protection requirements, safe zones, turnout locations, helispots/heliports, fuel break locations, natural barriers, evacuation routes, and areas of limited suppression.	CDF, Local Fire Departments	5.7	Ongoing
(1)	<b>fir13</b>	Assign the duties of <b>implementation of the Fire Management Plan</b> and incident commander to an existing or new <b>LRMS staff member</b> .		5.7	To Do
(1)	<b>saf1</b>	Develop <b>law enforcement procedures</b> for SFPUC and LRMS staff		5.8	Initiated
(1)	<b>saf2</b>	Develop and implement an LRMS <b>safety and security program</b> to address safety and emergency response procedures on the watershed.	Lessees, EBRPD	5.8	Initiated
(1)	<b>saf3</b>	Designate and train an LRMS <b>safety coordinator</b> to oversee the safety and security program and train employees in safety and emergency response procedures.		5.8	To Do
(1)	<b>saf4</b>	Regularly <b>inspect and maintain the facilities and areas used by the public</b> and assign responsibilities for maintenance of these facilities to the appropriate agency.	Lessees, EBRPD	5.8	Ongoing
(1)	<b>saf15</b>	Review utility emergency response plans for non-SFPUC <b>pipeline failure procedures</b> .	Utilities	5.8	Initiated
(1)	<b>saf17</b>	Coordinate with Alameda and Santa Clara Counties and EBRPD to develop a <b>schedule of fines and penalties</b> for watershed infractions.	Counties, EBRPD	5.8	To Do
(1)	<b>veg8</b>	Identify areas subject to <b>slope instability</b> and failure based on soils, geology, and landslide data layers in the GIS. Prevent erosion by following the BMPs.		5.9	Ongoing
(1)	<b>veg9</b>	Identify and indicate in the GIS areas where land disturbance has accelerated <b>mass movement or soil erosion</b> processes to unacceptable levels. Stabilize these areas using soil conservation BMPs.		5.9	Ongoing

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)	<b>veg 11</b>	Develop and implement an <b>IPM Program for the LRMS, specific to the watershed and watershed resources.</b>	BERM	5.9	Ongoing
(1)	<b>veg13</b>	Encourage agencies to minimize disturbance of <b>serpentine bedrock or soils</b> to prevent erosion of asbestos fibers into the water supply.	EBRPD, CalTrans, Counties	5.9	Ongoing
(1)	<b>wil10</b>	<b>Institute seasonal prohibition of activities</b> during breeding periods and enact appropriate mitigation measures to protect species of concern.	Lessees, EBRPD	5.10	Ongoing
(1)	<b>aqu2</b>	<b>Manage reservoir water levels</b> according to the Operations Plan to maintain relatively stable water levels.	Operations	5.11	To Do
(1)	<b>aqu3</b>	Identify and <b>prioritize for rehabilitation reservoir shoreline areas</b> within the High WQVZ which are providing excessive sedimentation into the reservoirs.	CDFG, RWQCB, COE	5.11	To Do
(1)	<b>aqu5</b>	<b>Rehabilitate shoreline areas</b> using structural shoreline protection practices in areas where erosion and sedimentation cannot be adequately controlled by land use restrictions.	CDFG, COR, USFWS, NMFS, EBRPD, Lessees COE	5.11	To Do
(1)	<b>aqu6</b>	Conduct a <b>Sediment Transport Study</b> to identify stream segments with excessive bank erosion or channel sedimentation and prioritize segments for rehabilitation.	CDFG, COR, USFWS, NMFS, EBRPD, Lessees	5.11	To Do
(1)	<b>fis1</b>	Maintain <b>access for fish species of concern</b> from reservoirs to upstream spawning grounds.	CDFG, NMFS, USFWS, Lessees	5.12	To Do
(1)	<b>fis6</b>	Identify and adopt alternative <b>non-toxic management practices</b> to protect aquatic resources.	EBRPD, Lessees	5.12	Ongoing
(1)	<b>env5</b>	<b>Incorporate mitigation measures</b> identified in the program-level EIR into the Alameda Watershed Management Plan.		5.15	To Do

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)	env7	Due to the large volume of ongoing SFPUC projects requiring environmental review and mitigation monitoring, work with other SFPUC departments and MEA to <b>develop a new position</b> within MEA responsible for environmental review and mitigation monitoring related to all SFPUC projects.		5.15	To Do
(1)	lea1	Develop a <b>Scientific, Educational, and Agency Permit Reservation System</b> and assign staff duties to an existing or new LRMS staff member.		5.15	To Do
(1)	lea2	<b>Develop and staff a Watershed Information and Public Access Permit Reservation System</b> that is informative and easy to use.		5.15	To Do
(1)	lea3	In coordination with the Bureau of Commercial Land Management, <b>amend leases and easement agreements</b> to include water quality protection measures, required BMPs, emergency response plans, monitoring programs, inspection privileges, water conservation measures, IPM policies and procedures in compliance with the IPM Plan, and schedule of enforcement procedures and penalties.	Lessees Water Quality Bur.	5.15	Ongoing
(1)	lea8	Assign the duties of <b>lease coordinator</b> to an existing or new LRMS staff member responsible for overseeing Actions lea4, lea5, lea6, and lea7.1.		5.15	To Do
(1)	pub1	Develop and implement an overall <b>Watershed Public Education Program</b> .		5.16	To Do
(1)	pub2	Designate an existing or new LRMS staff member to assume the responsibilities of <b>implementing the overall public education program</b> .		5.16	To Do
(1)	pub6	Develop a <b>mobile watershed exhibit</b> to be displayed at popular Bay Area locations and local schools.	Local Cities and School Districts	5.16	To Do
(1)	pub7	Develop a <b>public use areas map</b> to be distributed at watershed kiosks, the Watershed Visitor Education Center (if constructed), and by docents.		5.16	To Do
(1)	pub9	<b>Publish rules and regulations</b> regarding prohibited and permitted uses, potential hazards, emergency numbers, etc. in brochures, bulletins, water bill inserts, newsletters, etc.		5.16	To Do

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)	<b>pub11</b>	Develop a <b>docent program</b> to allow individuals access to select areas of the watershed that are generally closed to public access.	EBRPD, Lessees	5.16	To Do
(1)	<b>pub13</b>	Develop <b>written agreements</b> with public and private <b>landowners</b> outside of SFPUC-owned watershed lands to institute voluntary restrictions on land uses and activities that will protect water quality.	Alameda County Santa Clara County ACRCS	5.16	Ongoing
(1)	<b>pub16</b>	Coordinate with <b>Bay Area Schools and Universities</b> to develop watershed-based curriculum/projects.	Bay Area Schools/Universities	5.16	To Do
(1)	<b>sta1</b>	<b>Evaluate</b> all existing <b>LRMS and non-LRMS staff responsibilities</b> that are watershed related to assure there are an adequate number, type and classification of positions. Wherever possible, assign responsibilities to existing staff.		5.17	To Do
(1)	<b>sta2</b>	Evaluate all watershed operations and maintenance activities and <b>establish standards for staff</b> and time allocations for each activity.		5.17	Ongoing
(1)	<b>sta3</b>	Assign a watershed management <b>staff member to oversee watershed maintenance activities.</b>		5.17	Ongoing
(1)	<b>sta4</b>	<b>Provide adequate staff</b> to monitor legal and illegal watershed activities.		5.17	To Do
(1)	<b>sta5</b>	Provide additional <b>training for</b> watershed keepers and LRMS staff in <b>enforcement and safety procedures</b> and identification of activities that could degrade water quality.	EBRPD County Sheriff CDF, Water Quality Bur.	5.17	Ongoing
(1)	<b>sta6</b>	<b>Conduct water quality and ecological resources training</b> for LRMS staff, operations supervisors and crews, SFPUC UEB engineers, and project managers.	Water Quality Bur.	5.17	To Do
(1)	<b>sta7</b>	<b>Conduct training classes</b> for watershed managers, watershed keepers, and crew supervisors on the management and protection of significant <b>cultural resources.</b>	CDF	5.17	Ongoing
(1)	<b>sta8</b>	<b>Provide mandatory Watershed Management training for</b> all appropriate SFPUC staff to become familiar with this Plan and the required procedures.		5.17	To Do

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)	<b>sta9</b>	<b>Train</b> selected staff and docents <b>to provide meaningful interpretation</b> of watershed resources and to assist with community outreach.		5.17	To Do
(1)	<b>sta10</b>	<b>Provide fire-related training</b> to select staff members as appropriate.	CDF, CDFG County Fire Dept.	5.17	Ongoing
(1)	<b>sta11</b>	Establish an <b>employee training program for safety and emergency response</b> procedures.	County Sheriff's Departments	5.17	Ongoing
(1)	<b>fic8</b>	<b>Evaluate</b> and rank all <b>lands</b> within the hydrologic watershed outside of SFPUC's landholdings <b>for outright potential purchase</b> or establishment of <b>easements</b> of these lands.	Alameda County/ Santa Clara County Planning Depts.	5.18	To Do
(1)	<b>fic10</b>	Develop and implement a schedule of <b>finest and/or penalties for failure to meet lease requirements.</b>	Bur. of Commercial Lands		To Do
(1)	<b>inf2</b>	Assign GIS database operations and maintenance duties to a qualified <b>GIS technician</b> responsible for all resource updates and queries.		5.19	To Do
(1)	<b>inf5</b>	Assign the duties of maintaining and <b>updating the watershed web page</b> to an LRMS staff member trained in web page maintenance.		5.19	To Do
(1)	<b>des3</b>	Assign an LRMS staff member to be the <b>Proposed Projects Review Coordinator</b> to oversee the Review Process for Proposed Plans and Projects.		5.20	Completed
(1)	<b>des7</b>	Establish a <b>universal access program</b> to address all watershed facilities and trails.	EBRPD	5.20	To Do
(1)	<b>sun2a</b>	Work with Alameda County to <b>amend the existing permits south of I-680</b> to achieve a maximum mining depth of 200 feet and a maximum mining footprint (Option 1).	Alameda County Lessee, Bur. of Commercial Lands, CAO	5.21	To Do
(1)	<b>sun2b</b>	Work with Alameda County to <b>amend the existing mining permits south of I-680</b> to increase the mining depth of existing permitted areas to 200 feet (Option 2).	Alameda County Lessee, Bur. of Commercial Lands CAO	5.21	To Do

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)	<b>sun12</b>	Prepare a <b>conceptual landscape and recreation plan</b> as required by SMP-32 for the restoration and public use of the Sunol Water Temple, its environs and historic entry.	Mining Lessee Alameda County	5.21	Completed
(1)	<b>gra1</b>	Implement <b>grazing management controls</b> to reduce the risk of viable pathogen discharges and maintain and improve ecological resources.	Lessees, RCD	5.22	Ongoing
(1)	<b>gra2</b>	Implement <b>structural protection measures</b> to reduce the risk of viable pathogen discharges and maintain and improve ecological resources.	Lessees, RCD	5.22	Ongoing
(1)	<b>gra4</b>	Implement specific criteria for <b>lessee selection</b> .	RCD	5.22	Ongoing
(1)	<b>gra5</b>	Implement a set of <b>lease requirements and terms</b> .	Lessees, RCD	5.22	Completed
(1)	<b>gra8</b>	Implement improvements for the <b>Lower Alameda Creek Watershed Protection Area</b> .	Lessees, RCD	5.22	To Do
(1)	<b>gra14</b>	Identify improvements to be accomplished by the tenants through a <b>work-credit provision</b> in the individual leases.	Lessees, RCD	5.22	Ongoing
(1) (A)	<b>saf16</b>	<b>Coordinate with the EBRPD</b> in maintaining and enforcing the safety and security program.	EBRPD County Sheriff	5.8	Ongoing
(1)(A)	<b>wil8</b>	<b>Periodically update an LRMS database</b> on sensitive species within the watershed.	USFWS, CDFG, NMFS	5.10	To Do
(1)(A)	<b>aqu4</b>	<b>Prohibit or regulate</b> the timing or intensity of <b>land use activities</b> in high risk shoreline areas consistent with other management actions in this Plan.	CDFG, EBRPD, Lessees, CalTrans	5.11	Ongoing
(1) (A)	<b>pub10</b>	Provide and periodically update select <b>watershed information</b> to the public and other agencies using SFPUC's Internet <b>website</b> .	BEMIS	5.16	To Do
(1)(A)	<b>fic2</b>	Continue/authorize or prohibit specific <b>lease and/or permit activities</b> based on the results of the cost and benefit analysis.		5.18	To Do

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)(A)	<b>fic5</b>	<b>Target funds for watershed management</b> activities and staff positions according to priorities, available funding, and the ability to provide funding.		5.18	Ongoing
(1)(A)	<b>fic9</b>	Coordinate with upstream landowners to develop and <b>place a natural and cultural resources conservation easement</b> over non-SFPUC owned watershed lands.	CDFG, Alameda/Santa Clara Cos.	5.18	To Do
(1)(A)	<b>des1</b>	Meet with proponents of new plans and projects prior to detailed design or development to identify <b>requirements of the Watershed Management Plan</b> which must be met.		5.20	Ongoing
(1)(A)	<b>des2</b>	<b>Evaluate</b> all proposed plans and projects as part of the Review Process for Proposed Plans and Projects <b>using the Watershed Goals and Policies Compliance Checklist.</b>		5.20	Initiated
(1)(A)	<b>gra6</b>	Implement improvements for the <b>San Antonio Watershed Protection Area.</b>	Lessees, RCD	5.22	Initiated
(1)(A)	<b>gra7</b>	Implement improvements for the <b>Calaveras Watershed Protection Area.</b>	Lessees, RCD	5.22	Initiated
(1)(A)	<b>gra11</b>	Seek and procure funding for phased improvements Watershed Protection Areas through several <b>existing watershed protection program funding mechanisms.</b>	Lessees, RCD	5.22	To Do
(1)(A)	<b>gra12</b>	<b>Apply for funding</b> of one or more of several State Revolving Fund (SRF) Loans available for source water protection, assessment, and monitoring.	Lessees, RCD State of California	5.22	To Do
(1)(A)	<b>gra13</b>	<b>Direct funding to another agency,</b> such or the RCD, for actual installation and construction of improvements.	RCD	5.22	To Do
(1)(B)	<b>haz7.1</b>	Periodically <b>assess the adequacy</b> of the hazardous materials spill clean-up contractor to assure that all anticipated needs will be met in the event of a spill.		5.3	To Do
(1)(B)	<b>haz11</b>	Practice <b>interagency spill response.</b> Where needed, improve elapsed time between spill event and notification of SFPUC staff.	CalTrans, Counties	5.3	To Do

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)(B)	<b>haz12</b>	<b>In coordination with Chevron, conduct ongoing monitoring of the pipeline</b> for potential hazards and assure that spill response measures are adequate.		5.3	Ongoing
(1)(B)	<b>roa7</b>	<b>Maintain fire roads</b> to minimize sediment generation through effective installation of waterbars, avoidance of unnecessary grading, and paving short lengths of road.	CDF	5.5	Ongoing
(1)(B)	<b>con1</b>	Periodically evaluate <b>landscaping and irrigation practices</b> for water efficiency; implement water conservation techniques where necessary.	Lessees, EBRPD	5.6	To Do
(1)(B)	<b>fir8</b>	Complete the <b>fuel management projects</b> listed in the Fire Management Element (Appendix A-I) to reduce fuels on the watershed.	CDF, EBRPD BAAQMD	5.7	To Do
(1)(B)	<b>saf5</b>	Conduct regular, <b>on-site risk assessment inspections</b> of SFPUC facilities in conjunction with the safety and security program and other maintenance activities.	Lessees, EBRPD	5.8	Ongoing
(1)(B)	<b>saf6</b>	Periodically and systematically <b>inspect</b> watershed perimeter <b>fencing, access gates, and locks</b> and repair/replace as required to minimize trespassing, straying cattle, etc.	Lessees, EBRPD	5.8	Ongoing
(1)(B)	<b>saf7</b>	Develop and periodically revise an <b>Emergency Response Plan</b> .	Lessees, EBRPD, Utilities, CalTrans, CDF, County Sheriff Departments	5.8	Ongoing
(1)(B)	<b>saf8</b>	Periodically conduct <b>emergency response practice drills</b> .	Lessees, EBRPD, Utilities, CalTrans, CDF, County Sheriff Departments	5.8	To Do
(1)(B)	<b>saf9</b>	<b>Periodically evaluate and update</b> the <b>safety and security program</b> .	Lessees, EBRPD, Utilities, CalTrans, CDF, County Sheriff Departments	5.8	Ongoing
(1)(B)	<b>saf10</b>	Conduct <b>daily boat patrols</b> of Calaveras and San Antonio Reservoirs to assess water quality emergencies, trespassing problems, and other emergency situations.		5.8	To Do

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(1)(B)	<b>saf11</b>	<b>Maintain two LRMS patrol boats</b> for ongoing patrols and emergencies		5.8	Ongoing
(1)(B)	<b>saf12</b>	Develop, publish, and periodically update a <b>Watershed Manual</b> that addresses operations and maintenance procedures, emergency response procedures, and the safety and security program.	Lessees, EBRPD	5.8	Initiated
(1)(B)	<b>saf14</b>	Coordinate with the Alameda and Santa Clara County Sheriff and Fire Departments to develop and periodically update an <b>evacuation plan</b> for disasters.	County Sheriff and Fire Departments OES	5.8	To Do
(1)(B)	<b>lea4</b>	<b>Develop</b> a water quality protection and monitoring plan for each lease to identify water quality improvements and to quantify <b>potential water quality impacts of lease operations</b> and permitted activities.	Water Quality Bur.	5.15	Initiated
(1)(B)	<b>fic7</b>	<b>Evaluate alternative</b> sources of <b>funding and implementation</b> methods for continuing to provide public use activities on the watershed.	Counties, CDFG, EBRPD, Schools and Universities	5.18	To Do
(1)(B)	<b>gra9</b>	Implement monitoring to insure verification of completion of, or <b>adherence to program plans and activities.</b>	Lessees, RCD	5.22	To Do
(1)(B)	<b>gra10</b>	Implement monitoring to <b>assess program(s) effectiveness.</b>	Lessees, RCD	5.22	To Do
<b>Phase 2</b>					
(2)	<b>haz3</b>	Identify and prioritize for removal from SFPUC lands, <b>dump sites</b> that pose a threat to water quality and watershed resources.	Lessees, EBRPD Alameda County Santa Clara County	5.3	
(2)	<b>was1</b>	Assess condition of SFPUC <b>vault, chemical, and composting toilets;</b> repair/replace as necessary to minimize risk of contamination of water supplies.	EBRPD, Lessees Water Quality Bur. Operations	5.4	
(2)	<b>was2</b>	Inspect sanitation and waste treatment systems at <b>Sunol Valley Golf Course</b> to assess condition, performance, and impacts on surface and groundwater quality.	Lessee Bur. of Commercial Lands Water Quality Bur.	5.4	
(2)	<b>roa5</b>	<b>Reduce the need for multiple</b> maintenance access <b>roads</b> on infrastructure easements by consolidation.	Utilities, Lessees	5.5	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(2)	<b>roa8</b>	<b>Restrict access on low use roads</b> by gates or barriers, allow revegetation, and use mowing as the road maintenance, or provide waterbars or broad dips.	CDF, Lessees	5.5	
(2)	<b>fir14</b>	Establish <b>permanent transects</b> and vegetation plots in treatment and control areas to determine effects of fuel management treatments.		5.7	
(2)	<b>saf13</b>	Work with CalTrans and the Counties to <b>install signs and emergency call boxes and emergency response telephone numbers</b> on I-680, Route 84, and Calaveras Road about risk of fires, vehicle accidents, risk of spills.	CalTrans, Counties	5.8	
(2)	<b>veg1</b>	Prepare and implement a <b>Vegetation Management Plan</b> .	CDFG, EBRPD	5.9	
(2)	<b>veg5</b>	Develop an <b>oak planting program</b> in coordination with grazing and fire management activities.		5.9	
(2)	<b>veg5.1</b>	Develop a <b>native species planting program</b> for implementation in disturbed areas in coordination with grazing and fire management activities.		5.9	
(2)	<b>veg6</b>	Identify and <b>remove</b> , using IPM practices, <b>invasive exotic plant species</b> .		5.9	
(2)	<b>veg12</b>	Coordinate with <b>PG&amp;E</b> in <b>clearing vegetation</b> as appropriate around powerlines, transformers, and pole structures.	PG&E Bur. of Commercial Lands	5.9	
(2)	<b>wil9</b>	Develop a comprehensive, multi-species <b>Habitat Conservation Plan</b> for the affect of SFPUC activities on species of concern within the Alameda Watershed over the next 50 years.	USFWS, NMFS, CDFG	5.10	
(2)	<b>aqu7</b>	<b>Rehabilitate stream segments</b> according to the determined priorities, and return them to a dynamic equilibrium where the channel is stable.	CDFG, USFWS RWQCB COE	5.11	
(2)	<b>aqu10</b>	Develop a <b>sedimentation basin and stock pond management program</b> in conjunction with preparation of the HCP.	COE CDFG	5.11	
(2)	<b>aqu13</b>	In conjunction with development of the HCP and sedimentation basin management program, obtain a “blanket” <b>Streambed Alteration Agreement (MOU)</b> from the CDFG for development, operation, and maintenance of sediment detention basins.	CDFG	5.11	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(2)	<b>fis2</b>	Identify all <b>unauthorized stream diversions</b> and remove those that are detrimental to fish passage in adherence to all existing regulations.	CDFG, RWQCB, COE	5.12	
(2)	<b>fis5</b>	In appropriate locations, allow <b>the accumulation of woody debris</b> in stream channels, consistent with CDFG recommendations, to create pools and riffles, reduce bank steepness, and provide cover.	CDFG, EBRPD, Lessees	5.12	
(2)	<b>cul9</b>	Implement <b>protective measures</b> to eliminate and minimize effects of public access on cultural resources.	EBRPD, Lessees	5.13	
(2)	<b>env1</b>	Assign <b>environmental compliance duties</b> to an existing or new LRMS staff member to oversee and facilitate all environmental compliance within the watershed.	OER, BERM	5.15	
(2)	<b>pub3</b>	<b>Establish</b> “gateway” information <b>kiosks</b> at major entryways to the watershed.	EBRPD	5.16	
(2)	<b>pub4</b>	<b>Establish a Watershed Visitor Education Center</b> to provide a gathering place for the discussion of water quality/supply concerns, water conservation, ecological resource studies, etc.	EBRPD Water Quality Bur.	5.16	
(2)	<b>pub5</b>	<b>Develop a coordinated graphics and signage program and supporting manual.</b>		5.16	
(2)	<b>pub8</b>	Develop <b>brochures and displays</b> to be used at watershed kiosks and the information center.		5.16	
(2)	<b>fic1</b>	<b>Evaluate costs and benefits</b> related to leasing, permitting, and public access activities on the watershed.		5.18	
(2)	<b>fic3</b>	<b>Calculate the appropriate charges</b> for lease activities and permit fees using the cost/benefit analysis method discussed under Action fic1.	Bur. of Commercial Lands	5.18	
(2)	<b>inf1</b>	<b>Establish and staff a Watershed Natural Resources Center</b> for use by SFPUC staff and other interested individuals and groups.		5.19	

<sup>1</sup> Phasing of the management actions is identified by one or more of the following categories: (1) Phase 1: within five years of plan adoption, (2) Phase 2: within ten years of plan adoption, (3) Phase 3: within twenty years of plan adoption, and/or: (A) on an As-Needed basis, and (B) at regular intervals throughout the life of the Plan.

**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(2)	<b>des8</b>	Using the priorities established in Action des7, implement <b>universal access improvements</b> at SFPUC facilities and trails.	EBRPD	5.20	
(2)	<b>sun10</b>	Retain the existing <b>Sunol Maintenance facility</b> as the base for East Bay operations and conduct recommended improvements.		5.21	
(2)	<b>sun13</b>	<b>Restore the historic entry</b> to the Sunol Water Temple along Paloma Way.	SHPO	5.21	
(2)	<b>sun14</b>	<b>Develop a public recreation area</b> around the Sunol Water Temple.	EBRPD County Sheriffs	5.21	
(2)	<b>gra3</b>	Evaluate the feasibility and potential benefits of <b>different types</b> or classes of <b>livestock</b> for achieving fuel reduction goals.	Lessees, RCD	5.22	
(2)(A)	<b>sto1</b>	Assess <b>on-site stormwater</b> collection and drainage <b>systems</b> for adequate sizing and erosion. Remediate where necessary.	Lessees, EBRPD	5.2	
(2)(A)	<b>roa6</b>	<b>Inspect and manage unpaved roads</b> , stormwater collection systems, unlined stormwater conveyance systems, and other stormwater facilities according to the California Forest Practices Act Rules.	CDF	5.5	
(2)(A)	<b>fis4</b>	Consult with CDFG regarding the <b>installation of fish screen and/or fish passage structures</b> where stream alteration/diversion cannot be avoided.	CDFG NMFS USFWS	5.12	
(2)(B)	<b>haz2</b>	Inventory and annually monitor all above- and below-ground <b>fuel storage tanks</b> , refueling stations, and vehicle maintenance yards.	Lessees Alameda. County Santa Clara County	5.3	
(2)(B)	<b>roa9</b>	<b>Periodically inspect closed roads</b> to ensure vegetation stabilization and drainage measures are operating as planned; conduct reseeding and drainage maintenance as needed.		5.5	
(2)(B)	<b>roa10</b>	Conduct <b>annual inspections and repairs</b> to reshape roads to conserve material, retain the design cross section and prevent or remove irregularities that retard normal surface runoff.	Lessees, EBRPD	5.5	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(2)(B)	<b>veg6.1</b>	<b>Identify stands of exotic trees</b> that serve as important roosting and nesting sites for various raptors and other birds protected by CDFG Code 3503. Work with appropriate agencies to preserve core habitat.		5.9	
(2)(B)	<b>veg10</b>	Establish and conduct <b>long-term hillslope erosion and sediment control monitoring</b> to evaluate the effectiveness of adopted protection measures.		5.9	
(2)(B)	<b>aqu8</b>	Establish and conduct long-term <b>stream corridor monitoring</b> to evaluate the effectiveness of adopted protection measures and/or rehabilitation projects.	CDFG	5.11	
(2)(B)	<b>aqu14</b>	Periodically <b>update the Bathymetry Study</b> for San Antonio and Calaveras Reservoirs to assess the impacts of stream and sedimentation basin rehabilitation on reduction in sediment transport.		5.11	
(2)(B)	<b>cul11</b>	<b>Periodically inspect historic structures</b> for pest damage and use IPM techniques to control pests in historic structures.	BERM Water Quality Bur.	5.13	
(2)(B)	<b>cul12</b>	<b>Periodically monitor known significant cultural resource sites</b> for evidence of disturbance, damage, or vandalism.	EBRPD, Lessees	5.13	
<b>Phase 3</b>					
(3)	<b>was3</b>	Assess the contribution of <b>wildlife excrement</b> to water quality degradation. Based on monitoring, develop management strategy if necessary.	CDFG Water Quality Bur.	5.4	
(3)	<b>wil3</b>	Identify and protect <b>primary wildlife movement corridors</b> , such as riparian corridors, and accommodate wildlife passage when designing fencing, culverts, stream crossings, and underpasses.	CDFG, Lessees, EBRPD	5.10	
(3)	<b>wil4</b>	Relocate or <b>eliminate unnecessary infrastructure</b> and facilities to reduce fragmentation and disruption of terrestrial habitat.	CDFG, Lessees, EBRPD SPARC	5.10	
(3)	<b>wil5</b>	<b>Remove/relocate unnecessary fencing</b> that may impede wildlife movement.	CDFG, Lessees, EBRPD	5.10	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(3)	<b>wil6</b>	Establish a <b>standard for number of snags</b> /fallen trees/nesting trees per acre for wildlife use and nutrient cycling. Downwood and brush piles should be left as habitat and cover where safety and fire hazard are not concerns.	CDFG, EBRPD	5.10	
(3)	<b>wil11</b>	<b>Monitor the effects of natural processes</b> that help maintain the variability of the ecosystem, but could negatively affect sensitive wildlife species.	CDFG	5.10	
(3)	<b>wil12</b>	<b>Monitor predator-prey relationships</b> to provide a basis for management and control, especially for ground squirrels, golden eagles, mountain lions, coyote, and deer.	CDFG, USFWS, NMFS	5.10	
(3)	<b>fis3</b>	Ensure that any <b>subimpoundments</b> within perennial or intermittent drainages allow for fish passage.	CDFG Lessees	5.12	
(3)	<b>pub17</b>	Identify and implement watershed ecological <b>restoration projects</b> or monitoring studies as components of watershed-based curriculum in applicable Bay Area schools and universities.	Bay Area Schools/Universities	5.16	
(3)	<b>sun1</b>	<b>Mine the existing permitted areas</b> in accordance with SMP-32 with completion of mining by 2035.	Lessee	5.21	
(3)	<b>sun3</b>	In preparation of the quarry pits for water storage, <b>design the reservoirs</b> to meet the guidelines for maintaining high water quality.	Alameda County Lessee, Bur. of Commercial Lands Water Quality Bur.	5.21	
(3)	<b>sun16</b>	<b>Explore the feasibility</b> of developing a working farm, a vineyard, nurseries, row crops, aquaculture and or wetlands.	CDFG, Lessees	5.21	
(3)	<b>sun19</b>	<b>Establish</b> a small <b>commercial site</b> near the intersection of I-680 and Route 84 to provide limited supplies for visitors.	Lessees, EBRPD	5.21	
(3)	<b>sun20</b>	<b>Establish</b> an <b>overnight study area</b> located in the Sunol Valley South of Hetch Hetchy Aqueduct.	EBRPD	5.21	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(3)	<b>sun21</b>	<b>Establish trail connections</b> which extend to the Sunol Regional Wilderness and also with trail connections established north of I-680.	EBRPD	5.21	
(3)(A)	<b>wil7</b>	Create palatable <b>re-sprouting browse</b> through mechanical vegetation treatments or prescribed fire in brush and woodland communities.	CDFG, EBRPD, Lessees	5.10	
(3)(A)	<b>sun4</b>	<b>Create sideslopes on the pits</b> such that there is a gradual transition to water rather than a drop to water at the uphill edge of each pit.	Lessee Bur. of Commercial Lands	5.21	
(3)(A)	<b>sun5</b>	Reclaim quarries with <b>sideslopes</b> appropriate to their proposed activity.	Lessee Bur. of Commercial Lands	5.21	
(3)(A)	<b>sun7</b>	<b>Suspend public access</b> to any reservoirs in the Sunol Valley, which allow public access when the reservoirs are drawn down due to drought or other emergency situation.	EBRPD	5.21	
(3)(A)	<b>sun11</b>	Following completion of mining the module closest to the Sunol Temple, backfill and landscape a ¼ mile <b>buffer zone</b> surrounding the water temple.	Lessee	5.21	
(3)(A)	<b>sun17</b>	<b>Provide for universal access</b> following the guidelines pertaining to accessibility for disabled persons.		5.21	
(3)(A)	<b>sun22</b>	<b>Contract with a concessionaire</b> , proven to be competent in the development and management of recreation facilities, to construct and operate the Sunol Valley recreation facilities.	EBRPD	5.21	
(3)(B)	<b>wil13</b>	<b>Monitor road kills</b> to better understand wildlife movement patterns. Design and install wildlife passage structures to minimize losses.	CDFG, CalTrans	5.10	
(3)(B)	<b>wil14</b>	<b>Monitor pest animal</b> populations to evaluate success in meeting population targets.	CDFG	5.10	
(3)(B)	<b>fis7</b>	Conduct strictly <b>regulated non-native fish depredation</b> to control populations of predaceous exotic game fish.	CDFG, EBRPD	5.12	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(3)(B)	<b>fis8</b>	Conduct <b>annual surveys</b> of fish populations and habitat conditions in conjunction with water temperature and water quality monitoring.	CDFG Water Quality Bur. Environmental & Field Services	5.12	
(3)(B)	<b>sun6</b>	To maintain water quality during normal operations, <b>operate the Sunol Valley reservoirs</b> according to the specified guidelines.	Water Quality Bur.	5.21	
(3)(B)	<b>sun8</b>	As the reservoirs are filled, <b>collect water quality data</b> from the influent water.	Water Quality Bur.	5.21	
(3)(B)	<b>sun9</b>	Once the reservoirs are full, a <b>sampling program</b> should be followed.	Water Quality Bur.	5.21	
(3)(B)	<b>sun18</b>	<b>Conduct periodic maintenance</b> , as needed, in the <b>Sunol Water Temple</b> such as that deterioration and alteration are avoided.	Operations	5.21	
<b>Phase A</b>					
(A)	<b>haz10</b>	Require CalTrans to include <b>spill containment and diversion facilities</b> in new and upgraded facilities along I-680 and Route 84.	CalTrans, CHP RWQCB Alameda County/ Santa Clara County Hazmat	5.3	
(A)	<b>was4</b>	Consult with Alameda and Santa Clara Counties regarding <b>new residential development</b> .	County Planning and Environmental Health Departments	5.4	
(A)	<b>roa11</b>	Monitor road conditions during <b>heavy use periods</b> and/or unfavorable weather conditions; limit use on the basis of road condition; close roads seasonally if warranted.	Lessees, CDF, EBRPD County Road Depts.	5.5	
(A)	<b>roa12</b>	Design, site, and construct <b>new roads and trails</b> following <b>guidelines</b> appropriate for wildland conditions.	CDF, CDFG	5.5	
(A)	<b>fir9</b>	Watershed staff shall <b>report and provide preliminary assessment</b> of all fires to CDF and Division Dispatch. Division Dispatch will in turn call 911 and notify the watershed manager.	CDF County Fire Dept.	5.7	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(A)	<b>fir10</b>	<b>Initial response</b> shall be made if a fire appears to be easily suppressed. If the fire is large or intense, evacuate and report situation to watershed dispatch.	CDF County Fire Dept.	5.7	
(A)	<b>fir11</b>	If an <b>evacuation</b> is necessary, watershed dispatch shall contact Alameda and Santa Clara County Sheriff Departments, Office of Emergency Services, EBRPD, and CDF.	County Sheriff Depts. OES, EBRPD County Fire Depts.	5.7	
(A)	<b>veg2</b>	Prior to initiating any watershed activity, <b>consult the GIS database</b> for vegetation communities and associated rare, threatened, endangered, and sensitive species.		5.9	
(A)	<b>veg3</b>	Prior to any watershed activity that may affect an <b>Ecological Sensitivity Zone (ESZ)</b> , survey for special status plants and map observed occurrences on the GIS database.		5.9	
(A)	<b>veg4</b>	Prior to initiating any construction project involving grading, proponent must prepare and implement a <b>grading plan</b> , subject to approval by SFPUC staff.		5.9	
(A)	<b>veg7</b>	Follow <b>erosion control BMPs</b> for wetlands protection and stream and shoreline areas.	CDFG, COE	5.9	
(A)	<b>wil1</b>	Conduct <b>site-specific review of new structures</b> , linear facilities, parking lots, roads, or trails to avoid adverse impacts to wildlife.		5.10	
(A)	<b>wil2</b>	Prior to undertaking any <b>watershed activity</b> in a high ESZ, survey affected habitat to determine the presence of listed or sensitive taxa and to minimize adverse effects.		5.10	
(A)	<b>aqu1</b>	<b>Conduct site-specific review</b> to assure that new facilities or activities are not located within a High Water Quality Vulnerability Zone.		5.11	
(A)	<b>aqu9</b>	<b>Create new wetland</b> habitat as part of a wetland mitigation banking system to offset impacts from SFPUC activities.	CDFG, USFWS, NMFS	5.11	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(A)	<b>aqu11</b>	Once sediment detention basins are in place, establish <b>monitoring</b> , cleanup, and dredging <b>guidelines</b> dependent on sediment loading rate.	CDFG, USFWS, NMFS	5.11	
(A)	<b>aqu12</b>	If needed for fire management, <b>install</b> long-term <b>sediment retention basins</b> that can be readily maintained.	CDF Lessees	5.11	
(A)	<b>cul1</b>	Conduct appropriate levels of <b>review prior to</b> undertaking activities involving <b>surface disturbance</b> and/or excavation to avoid damage to buried cultural resources.	Tribes, SHPO CDF	5.13	
(A)	<b>cul2</b>	Authorize <b>data recovery</b> by qualified professionals when deposits cannot be preserved through avoidance or protection measures.		5.13	
(A)	<b>cul3</b>	When considering <b>demolition or alteration of a historic structure</b> , consult with an architectural historian to determine the feasibility and suitability of relocation.		5.13	
(A)	<b>cul4</b>	<b>Evaluate and document</b> the significance of <b>cultural resources</b> threatened by demolition or alteration through application of state and federal criteria.	SHPO	5.13	
(A)	<b>cul5</b>	<b>Employ non-destructive methods</b> of research. Data, objects, and specimens recovered from research sites shall be conserved and curated according to legal requirements.		5.13	
(A)	<b>cul6</b>	<b>Suspend excavation activities</b> in the event that suspected cultural resources are uncovered; consult with a qualified archeologist.	SHPO	5.13	
(A)	<b>cul7</b>	<b>Suspend excavation activities</b> in the event that <b>human remains</b> are discovered and immediately inform proper authorities.	County Coroner, CNAHC Tribes	5.13	
(A)	<b>cul8</b>	When previously <b>unknown cultural resources</b> are discovered, report new findings to the California Historical Resources Information System (Information Centers).	SHPO	5.13	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(A)	<b>cul10</b>	Prior to new construction, <b>consider re-use</b> of existing historic structures for departmental uses.		5.13	
(A)	<b>env2</b>	<b>Review</b> new projects or activities <b>in coordination with BERM</b> to determine if such activities qualify as a “project” as defined by CEQA.	OER BERM	5.15	
(A)	<b>env3</b>	Require consultation with the LRMS environmental compliance staff member as a <b>condition of all new leases and renewals</b> granted within the watershed.	OER, Lessees BERM Water Quality Bur.	5.15	
(A)	<b>env4</b>	Require that SFPUC staff <b>consult</b> and get assistance from <b>environmental compliance staff member</b> prior to implementation of watershed activities.	OER BERM	5.15	
(A)	<b>env6</b>	Provide <b>comments on environmental documents</b> for projects within the greater hydrologic watershed to ensure that potential adverse effects on SFPUC lands are mitigated.	BERM	5.16	
(A)	<b>lea5</b>	Prior to approval of leases and permits requiring the use of pesticides, <b>review</b> the Chemical Application Management Program ( <b>CHAMP</b> ) prepared by the lessee or permittee.	Lessee Water Quality Bur. BERM	5.15	
(A)	<b>lea6</b>	Prior to approval of mineral, sand, or gravel leases, <b>review the reclamation plan</b> prepared by the lessee.	Lessee Bur. of Commercial Lands Alameda County	5.15	
(A)	<b>lea7</b>	Prior to the approval of any lease or permit conduct a <b>GIS database query</b> to determine presence of significant cultural or natural resources.	Bur. of Commercial Lands	5.15	
(A)	<b>pub12</b>	<b>Collaborate</b> with appropriate agencies/groups on the development of <b>educational materials</b> .	Water Quality Bur.	5.16	
(A)	<b>pub14</b>	<b>Coordinate</b> with applicable agencies and organizations in the compilation and maintenance of <b>resource databases</b> .		5.16	

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

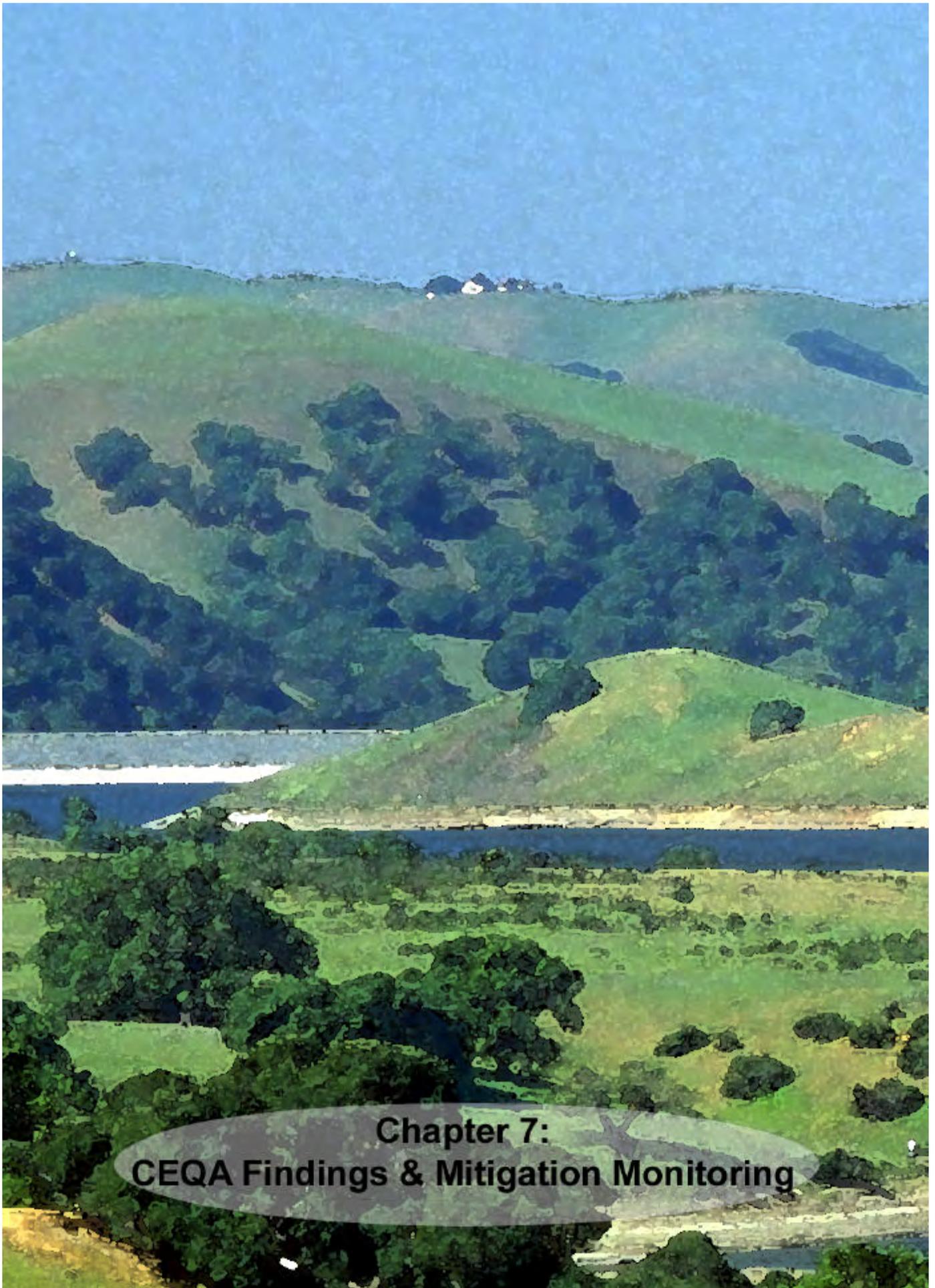
Phase	Mgmt. Actions	Description	Coordination	Section	Status
(A)	<b>pub15</b>	<b>Coordinate</b> with federal, state, regional, and local agencies on the development of watershed <b>educational displays and brochures</b> .		5.16	
(A)	<b>fic4</b>	<b>Modify existing leases and permit fees</b> , and set future leases and permits fees based on the calculations from Action fic3.	Lessees Bur. of Commercial Lands	5.18	
(A)	<b>fic6</b>	<b>Evaluate costs and benefits</b> associated with specific management activities and tasks <b>prior to authorization</b> of funds.		5.18	
(A)	<b>inf3</b>	As new data and findings become known, enter data into the <b>SFPUC GIS database</b> .		5.19	
(A)	<b>inf4</b>	Prior to any operations and maintenance and/or construction activities, <b>request a database check</b> for any known sensitive ecological or cultural resources.		5.19	
(A)	<b>inf6</b>	<b>Disseminate and acquire significant information</b> to applicable agencies and local and regional databases (e.g., California Natural Diversity Data Base).	CDFG, SHPO	5.19	
(A)	<b>des2.1</b>	Prior to the approval of any lease or permit involving construction or the introduction of additional people into the watershed, <b>conduct a carrying capacity analysis</b> to determine if the level or activity proposed is appropriate to the resources of the site(s) being considered. Redesign, relocate, or reject the proposal, as appropriate.		5.20	
(A)	<b>des2.2</b>	Prior to the approval of construction of any new facility or structure, within the watershed but outside of an Alquist-Priolo Earthquake Fault Zone, require appropriate geo-technical evaluations to assure that the structure can withstand the effects of a seismic event. If the facility or structure is intended for human occupancy and sited over active fault traces, design and construction should comply with the policies and provisions of the Alquist-Priolo Fault Hazard Act.		5.20	
(A)	<b>des4</b>	Prior to initiation of any new construction, or renovation/alteration, <b>construct permanent perimeter fencing</b> around the construction zone.			

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**Table 6-1 Implementation of the Alameda Watershed Management Actions by Phase**

Phase	Mgmt. Actions	Description	Coordination	Section	Status
(A)	<b>des4</b>	Prior to initiation of any new construction, or renovation/alteration, <b>construct permanent perimeter fencing</b> around the construction zone.		5.20	
(A)	<b>des5</b>	Ensure <b>design guidelines</b> are met prior to approval of new construction activities or renovation/alteration of existing facilities, structures and roads.	EBRPD Lessees	5.20	
(A)	<b>des6</b>	Prior to the design and construction of new facilities and trails ensure <b>compliance with all legally mandated accessibility standards.</b>	EBRPD	5.20	
(A)	<b>des9</b>	<b>Ensure</b> that a <b>dust abatement program</b> is implemented as part of all construction projects. The program should incorporate Bay Area Air Quality Management District recommended BMPs to reduce construction-related dust emissions.	EBRPD, Lessees	5.20	
(A)	<b>sun15</b>	<b>Prior to the design</b> of any new or alteration of any existing public access trails, ensure the specified <b>access and safety guidelines</b> are met.	EBRPD, Lessees	5.21	

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**Chapter 7:  
CEQA Findings & Mitigation Monitoring**

## Chapter 7. CEQA Findings and Mitigation Monitoring

### 7.1 Introduction

This chapter presents the Findings and the Mitigation Monitoring and Reporting Program for the Alameda Watershed Management Plan Environmental Impact Report (EIR). Both of the documents are required under the California Environmental Quality Act (CEQA).

The CEQA Findings and Mitigation Monitoring and Reporting Program were adopted by the SFPUC on September 26, 2000 (Resolution No.: 00-0229) at their duly noticed public hearing.



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## 7.2 CEQA Findings

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The following text sets forth the required CEQA Findings as adopted by the SFPUC.

### I Introduction

The following findings are hereby adopted by the San Francisco Public Utilities Commission (“SFPUC”) with respect to the Alameda Watershed Management Plan final Environmental Impact Report (“FEIR”) pursuant to the requirements of the California Environmental Quality Act, California Public Resources Code Sections 21000 et seq. (“CEQA”), 14 California Code of Regulations Sections 15,000 et seq., (the “CEQA Guidelines”) and Chapter 31 of the San Francisco Administrative Code.

The CEQA Findings document is organized as follows:

Article II provides a description of the Project. The actions to be taken by the SFPUC are described in Article III below.

Article IV of this document provides the basis for approval of the Project, a description of each Alternative, and the economic, legal, social, technological, and other considerations which support the rejection of the elements of the Alternatives analyzed in the FEIR.

Article V sets forth findings as to the disposition of each of the mitigation measures proposed in the FEIR. Mitigation measures are grouped in the following categories: (1) Measures recommended for adoption by the SFPUC exactly as proposed in the FEIR and which can be implemented by the SFPUC’s component bureaus’ and (2) Measure proposed in the FEIR and recommended by SFPUC for adoption and which are enforceable by agencies other than City agencies. Exhibit 1, following these findings, contains the full text of the mitigation measures as proposed in the FEIR. Exhibit 2 (section 7.3) contains the Mitigation and Monitoring and Reporting Program.

Article VI identifies the unavoidable, significant adverse impacts of the Project which have not been mitigated to a level of insignificance by the adoption of mitigation measures as provided in Article V, above.

Article VII contains a Statement of Overriding Considerations, setting forth specific reasons in support of the SFPUC’s actions and its rejection of the Alternatives not incorporated in the Project.

### II Project Description

**A. Detailed Project Description/Relationship to FEIR .** The following is a

description of the actions contemplated by the Alameda Watershed Plan and the Plan's relationship to the FEIR.

**1. Process.** The SFPUC approved the preparation of a comprehensive Watershed Management Policy and Plan in Resolution No. 91-0354. The SFPUC identified a preferred alternative for the Plan in Resolution No. 95-0011 and identified a preferred alternative for the Sunol Valley Resources Management Element of the Watershed Plan in Resolution No. 96-0090 dated May 14, 1996. A Draft Programmatic Environmental Impact Report ("DEIR") for the Watershed Plan was prepared and distributed to the public on December 11, 1999. The San Francisco Planning Commission ("Planning Commission") and SFPUC staff held two public hearings on the Watershed Plan on January 25, 2000 (Pleasanton hearing) and January 27, 2000 (San Francisco hearing). Public comments on the DEIR were received between December 11, 1999 and January 31, 2000. The FEIR was subsequently prepared and certified as complete under CEQA in motion no. 15931 of the Planning Commission on August 3, 2000. The Project, described in detail below, is based on the Project Description contained in the FEIR.

The Alameda Watershed Management Plan is subject to a program EIR because the Management Plan constitutes a series of actions that can be characterized as one large project that is related: "a) geographically; b) as logical

parts in a chain of contemplated actions; and c) in connection with the issuance of ... plans... to govern the conduct of a continuing program..." (CEQA Guidelines §15168(a)). The program EIR analyzes, at a general level, the potential environmental impacts of a broad range of policies and management actions. The program EIR is designed to focus attention on those aspects of a future project that could bring about adverse environmental impacts. In this way, the program EIR for the Management Plan may serve as a foundation for subsequent environmental documentation and/or clearance under CEQA. The FEIR identifies and analyzes the potential physical environmental impacts of the programwide policies and management actions presented in the Management Plan and proposes mitigation measures that would reduce those impacts determined to be significant. The FEIR calls out specific management actions or policies that would probably require further environmental review under CEQA.

The FEIR analyzes potential impacts of Management Plan actions that, although designed to fulfill the goals of the Management Plan, are still deemed to potentially result in adverse physical effects on the environment. The effects of these actions are generally protective in nature given the goals of the Management Plan. In most cases management actions were designed to reduce impacts that might arise from other management actions. The FEIR only

analyzes those management actions deemed to have potentially adverse physical impacts.

**2. SFPUC Mission and Project Location.** The SFPUC manages 36,000 acres of land in the larger 175 square mile Southern Alameda Creek watershed as part of its water supply deliveries to over 2 million Bay Area residents. These lands were acquired in 1930 from the Spring Valley Water Company. The SFPUC’s Alameda watershed lands remain largely protected and continue to serve their primary purpose of providing a high quality surface water supply for the SFPUC service area in Alameda, Santa Clara, San Mateo and San Francisco Counties. The Watershed Plan divides the SFPUC’s Alameda Creek landholdings covered by the plan into two categories: the “primary watershed” and the “secondary watershed.” The primary watershed consists of areas that drain to important SFPUC drinking water intakes such as Calaveras and San Antonio Reservoirs. The secondary watershed consists of downstream areas below major drinking water intakes where there is more preexisting development not under SFPUC control (e.g. housing in the Welch Creek drainage, highway 680, Andrade Road industrial facilities, etc.) In these areas, the SFPUC has authorized activities under long term leases such as mining, nursery operations, and golf course operations. Payments under these leases provide significant non-operating revenues that benefit San Francisco retail

water ratepayers, which are used to offset the cost of providing water to these customers.

The mission of the SFPUC is to serve its customers with reliable, high quality, and affordable water and wastewater treatment while maximizing benefits from Hetch Hetchy system power operations and responsibly managing the human, physical, and natural resources entrusted to its care. The SFPUC mission statement for watershed management includes the following goals:

- to provide the best environment for the production, collection and storage of the highest quality water for the City and County of San Francisco and its suburban wholesale water customers;
- to develop, implement, and monitor a resource management program which addresses all Watershed activities; and
- to apply best management practices for the protection of water and natural resources and to their conservation, enhancement, restoration, and maintenance, while balancing financial costs and benefits.

The purpose of the Alameda Watershed Management Plan is to provide a policy framework for the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate for Watershed lands given the mission statement adopted by the SFPUC and the goals of the Management Plan. The Management Plan pro-

vides a comprehensive set of goals, policies, and management actions that address all Watershed activities and reflect the unique qualities of the Alameda Watershed.

In addition to serving as a long-term regulatory framework for decision-making by the SFPUC, the Management Plan is also intended to be used as a Watershed management implementation guide by the SFPUC's Land and Resource Management Section (LRMS) staff. The Management Plan provides the LRMS with management actions designed to implement the established goals and policies for water quality, water supply, ecological and cultural resource protection, fire safety management, Watershed activities, public awareness, and financial management. The Management Plan also enables LRMS staff to address and plan for future management issues such as fire management, erosion control, public access, security, development encroachment, construction and maintenance of utility facilities, and ecological resource management. The Management Plan sets SFPUC policy for watershed management and actions to effectuate this policy, subject to available funding and staffing.

The Management Plan was designed to improve the SFPUC's ability to protect its watershed holdings. The overall environmental impacts of the Management Plan are beneficial due to the fact that management actions outlined in the Plan are designed to improve con-

ditions over current practices. However, some actions also have the potential to cause physical impacts on the environment. Analysis of these actions formed the core of the FEIR.

**3. Management Plan Goals and Policies.** The primary goal of the Watershed Management Plan is to maintain and improve source water quality to protect public health and safety. The secondary goals of the Management Plan are to (1) maximize water supply; (2) preserve and enhance the ecological and cultural resources of the watershed; (3) protect the watershed, adjacent urban areas, and the public from fire and other hazards; (4) continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands, including educational, recreational and scientific uses; (5) provide a fiscal framework that balances financial resources, revenue-generating activities, and overall benefits in an administrative framework that allows implementation of the Watershed Management Plan; and (6) enhance public awareness of water quality, water supply, conservation, and watershed protection issues.

The policies of the Management Plan are organized into 11 major topics as follows:

- **Water quality**
- **Water supply**
- **Vegetation**
- **Wildlife**

- . **Aquatic resources**
- . **Cultural resources**
- . **Fire**
- . **Safety and security**
- . **Watershed activities**
- . **Public awareness**
- . **Administration and finance**

Policies designed to support the Management Plan’s primary goal of maintaining and improving source water quality are organized into seven sub-topics as follows:

- . **Physical, chemical and biological considerations.** Water Quality Policies set forth in the Management Plan would prevent the introduction of pesticides and chemicals into the water supply through restrictions on the use of pesticides and transport of other hazardous chemicals. The SFPUC’s water supply would be protected under these policies by preventing the introduction of a variety of pollutants to the water supply.
- . **Roads, trails and rights-of-way.** These policies are designed to prevent increased erosion and runoff resulting from maintenance of existing roads and trails and by limiting new construction.
- . **Erosion, sedimentation, and increased runoff.** These policies control runoff and contaminants by minimizing sources of such contamination, limiting impervious surfaces, and installation of sedimen-

tation basins.

- . **Coordination, collaboration and land management.** These policies protect water quality by regulating construction in the SFPUC watershed holdings and by collaboration with other entities with jurisdiction over development proposals upstream.
- . **Wetlands, riparian areas and stream channels.** These areas are protected due to their proximity to water sources and their ability to filter pollutants and improve water quality.
- . **Access restrictions and enforcement.** These policies call for strictly controlling public access to minimize adverse affects to water quality.
- . **Monitoring.** The Plan calls for extensive monitoring of land uses and activities that could introduce pathogens into the water supply.

**4 Management Plan Actions and Guidelines.** Based on the goals and policies described above, the Management Plan presents management actions and guidelines that are designed to implement goals and policies. The actions and guidelines will guide SFPUC staff in the day-to-day activities required to manage the watershed. Management Plan actions are to be implemented over a 20 year period following plan adoption.

Management actions are organized by topics as follows:

**a. Stormwater** actions are designed to manage and improve stormwater drainage facilities where necessary.

**b. Hazardous materials and contamination** actions address proper use and storage of hazardous materials at SFPUC facilities and procedures for spill incidents.

**c. Human and animal waste** actions include inspection procedures for SFPUC and lessee facilities; survey actions to assess the impacts of wildlife excrement on water quality; and coordination with other agencies conducting activities in the watershed to reduce water quality risks associated with human and animal waste.

**d. Roads** actions include assessing the existing condition of roads; taking action to reduce erosion; inspection requirements; and developing requirements for new roads.

**e. Conservation and reclamation of water** actions include evaluating measures to increase conservation of water and use of recycled water in the watershed.

**f. Fire management** actions include fire protection/ prevention equipment; installation of fire defense improvements; undertaking fuel management projects to reduce fire risk; and ongoing monitoring.

**g. Safety and security** actions include the development of law enforcement procedures, a safety and security program, and an emergency response plan; preparation of a watershed manual; and coordination with adjacent agencies and lessees.

**h. Vegetation and soil management** actions include procedural requirements to follow before conducting new activities; development of a vegetation management plan and forest management prescriptions; restoration activities and removal of exotics; and coordination with other parties.

**i. Wildlife** actions include procedural requirements to be undertaken prior to initiating new activities that could impact wildlife habitat; protection of movement corridors and habitat; preparation of a Habitat Conservation Plan; identification of future studies; and prohibition of certain activities based on special status species' needs.

**j. Aquatic zone protection and fisheries** actions include procedural requirements prior to project initiation; measure to protect reservoir shorelines, stream channels, banks and wetlands; methods to encourage fish migration in tributary streams to reservoirs; and sediment management actions.

**k. Cultural resource** actions include procedural requirements prior to project initiation; methods for protecting existing resources; and monitoring to en-

sure protection of cultural resources.

**l. Environmental compliance** actions include appropriate staffing to ensure compliance with environmental laws and assess the impacts of proposed activities, and incorporating the FEIR mitigation measures into the final Management Plan.

**m. Lease and permit requirements** include development of a permit reservation system and establishment of new lease and permit requirements consistent with the plan.

**n. Public and agency outreach** actions include development of education programs, outreach facilities, and a docent program; and collaboration efforts with agencies, educational institutions and non-profit groups.

**o. Staffing and training** actions include measures to develop staff responsibilities; training in enforcement procedures, watershed resources and the contents of the plan; and fire management/emergency response training.

**p. Fiscal framework** actions include evaluating costs and benefits of watershed activities; securing adequate watershed management funding; identification of alternative funding sources; identification of lands for acquisition

**q. Information management** actions include establishment of a visitor education center and maintenance of Geo-

graphic Information System mapping and Watershed web page.

**r. Design and construction requirements** actions include review processes for proposed projects to assure compatibility with the Management Plan; design guidelines; and universal access requirements.

**s. Sunol Valley** actions include mining north of Freeway 680 under Surface Mining Permit 32, with two options south of 680: limited expansion of permitted mining footprints and depths to 200 feet; and depth increases to 200 feet within the existing permit boundaries. Other actions include reservoir design considerations for future water storage reservoirs; water quality monitoring; and guidelines for recreation and related activities in the future quarry reservoirs.

**t. Grazing management** actions include continued implementation of the 1997 Grazing Management Plan.

FEIR table II-1 summarizes the proposed actions under the Management Plan and which actions were analyzed in the FEIR. Table II-1 is incorporated by reference in these findings.

### III Actions

The actions of the SFPUC in connection with the Project include the following:

1. Adoption of CEQA findings, including a statement of overriding considerations, mitigation measures, and a mitigation monitoring and reporting program.

2. Approval and adoption of the Alameda Watershed Management Plan to guide the management of the SFPUC's Alameda Watershed landholdings covered by the Plan.

## **IV Alternatives**

### **A. Development of the Management Plan Preferred Alternative.**

1. **Watershed Management Plan Alternatives.** As discussed in Section II above, the project is based generally on the project description in the FEIR. In approving the Project, the SFPUC has carefully considered the attributes and environmental effects of the Projects and the Alternatives discussed in the FEIR. This consideration, along with the reports from City staff, government agency input, and considerable public testimony, has resulted in the Project. The range of alternatives considered does not include an alternative to the location of the Management Plan, as the Management Plan by definition is location-specific and its goals, plans, and policies cannot be shifted to an alternate location. The Project represents a combination of features that, in the opinion of the SFPUC, most closely achieves the Project Goals and Policies as set forth in the FEIR.

Prior to preparation of the Management Plan, the SFPUC conducted an extensive analysis of water quality, natural resources, cultural resources, and fire hazard data and conducted a series of public and agency workshops. This analysis resulted in a set of resource vulnerability/sensitivity maps and defined areas of the watershed where resources are most sensitive to disturbance. The data analysis was combined with public comments and public survey results to form three watershed management alternatives.

Watershed Management Plan alternative A provides for the highest improvement in water quality and emphasizes ecological resource protection and enhancement. Public access to the watershed and revenue generation would be very limited under alternative A. Watershed Management Plan Alternative B provides for moderate improvement in water quality and balanced ecological resource protection and public access. Watershed Management Alternative C provides a slight improvement in water quality and emphasizes increased public access. Based on input from the public, agencies, the project consultant team, and the SFPUC Watershed Planning Committee, the SFPUC developed the preferred alternative. The preferred alternative combines Alternative B with some components of Alternative A.

2. **Reasons for Selection of the Watershed Management Plan Preferred Alternative.**

The preferred Watershed Management Plan Alternative represents the combination of features which, in the opinion of the SFPUC, most closely achieves the goals of the Management Plan set forth in the FEIR as follows:

**a. Maintaining and improving source water quality to protect public health and safety:**

The preferred alternative balances the desire for increased public access and educational opportunities with the desire to improve source water quality. The Management Plan contains mitigation measures to offset the impacts of increased access for an overall improvement in water quality, avoiding some of the costs and impacts associated with Watershed Management Alternative C and the restrictions on public access in Watershed Management Alternative A.

**b. Maximize water supply.** The preferred alternative supports this goal by maximizing reservoir storage in existing reservoirs and through the creation of new reservoirs in completed quarry pits in Sunol Valley; prevents interruptions to water supply; minimizes water use in the watershed through increased conservation and potential use of recycled water; and minimizes the release of water that cannot be recaptured.

**c. Preserving and enhancing the ecological and cultural resources of the watershed.** Watershed vegetation is protected through policies affecting chemical use; invasive plant species; protec-

tion of special status vegetation and habitats; and site-specific environmental analysis for proposed facilities and maintenance activities. Wildlife is protected through policies protecting habitat and wildlife populations; eradication of pest species; minimization of human disturbance; study of wildlife populations; and site-specific environmental analysis for proposed facilities and maintenance activities. Aquatic species are protected by maintaining biodiversity; minimization of chemical additions; prohibition of non-native fish stocking; coordination with other governmental agencies; restrictions on activities in areas of high water quality vulnerability; promotion of wetland mitigation banking; and site-specific environmental analysis for proposed facilities and maintenance activities. Cultural resources are protected by coordination with other agencies; consultation with Native American organizations; and site-specific environmental analysis for proposed facilities and maintenance activities.

**d. Protection from fire and other hazards.** Fire policies in the Management Plan protect the watershed in terms of fire prevention and through vegetation management measures. Safety concerns resulting from public access are also addressed.

**e. Continue existing compatible uses and provide opportunities for potential compatible uses on the watershed, including education, recreational and**

**scientific uses.** The Management Plan prohibits a number of activities, e.g. hunting, which are deemed detrimental to the watershed. Certain other activities are allowed by permit, e.g. research by non-SFPUC personnel. Recreational activities must be compatible with the setting in which they are proposed, may not adversely affect watershed resources, and comply with the goals and policies of the Management Plan. New recreation in the Primary Watershed must be resource based, i.e. related to the inherent natural and other resources present. Access to existing open trails is preserved. New trails may be considered in zones of lesser vulnerability and risk when consistent with the goals and policies of the Management Plan. The plan supports new trail connections that link adjacent communities and trails of other agencies, primarily in the secondary watershed. The existing Sunol Valley golf course could be expanded under the Plan in areas of low sensitivity. The level of recreational opportunities allowed under the Watershed Management Plan Preferred Alternative strikes a balance between the desire for increased public access and the need to minimize the environmental and economic impacts of such access.

For proposed plans and projects, the Management Plan creates a review process to ensure that all future land management decisions and uses remain consistent with Plan goals and policies. In addition, the Management Plan provides procedural guidelines for everyday

operations and maintenance activities such as road maintenance, mowing, and controlled burns.

In the Sunol Valley, specific management policies are provided in the Sunol Valley Resources Management Element of the Watershed Plan. These policies broadly address the timing and location of mining in the Sunol Valley to expedite the creation of water storage facilities, while minimizing environmental impacts and maximizing revenues. Also addressed are the development of water based recreational activities in the Sunol Valley following the completion of existing quarry pits to water storage reservoirs upon completion of mining.

**f. Provide a fiscal framework that balances financial resources, revenue-generating activities, and overall benefits, and an administrative framework that allows implementation of the Management Plan.** The Management Plan provides that users bear the cost of watershed activities that are not related to the SFPUC's primary mission of providing high quality water, such as recreation and leasing/permit activities. In addition, SFPUC ratepayers will not be asked to bear the cost of mitigation measures needed to reduce the impacts of any public access proposals. Under the Preferred Alternative, existing leases would be preserved and in some cases expanded, leading to collection of additional revenues which could be used to offset the SFPUC Land and Resource Management Section's costs of implementing the preferred alternative.

**g. Enhance public awareness of water quality, water supply, conservation, and watershed protection issues.** Management Plan policies encourage public education and specify a number of awareness programs, and allow scientific research and education opportunities. Such opportunities would be foreclosed under Watershed Management Plan Alternative A.

### **B. Management Plan Alternatives Rejected and Reasons for Rejection.**

**Watershed Management Plan Alternative A:** The distinctions between alternatives evaluated in the Management Plan are set forth in the FEIR in table VII-2. Although Alternative A is the environmentally superior alternative in that it would restrict public access and result in a higher level of improvement in water quality, Alternative A is rejected because it would not continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands, including educational, recreational, revenue generating and scientific uses to the same degree as under the preferred alternative. Alternative A would not allow for possible expansion of the Sunol Valley Golf Course, even in areas of low ecological sensitivity. Grazing revenues would be reduced under Alternative A due to further reductions in grazing than contemplated in the 1997 Grazing Management Plan, which balances the protection of ecological resources, the need to manage watershed vegetation for fire protection,

and the protection of water quality. Nursery lessees would be relocated under Alternative A, potentially reducing revenues, whereas under the preferred alternative nursery operations would be set back further from water bodies as dictated by site specific conditions. Mining north of freeway 680 would be prohibited under Watershed Management Plan Alternative A, contrary to an existing lease to mine a 69 acre portion of this site held by Mission Valley Rock Company. Alternative A would not maximize revenue or water storage from mining activities in furtherance of the secondary goals of the Watershed Management Plan. Watershed Management Plan Alternative A is rejected because it does not meet the goals and objectives identified by the SFPUC which govern the plan, and does not achieve the appropriate balance of primary and secondary goals sought by the SFPUC.

**Watershed Management Plan Alternative B:** Watershed Management Plan Alternative B is rejected because, although similar to the preferred alternative, it would allow individual access to selected existing internal roads, increased group access to internal roads, and greater levels of equestrian use than under the preferred alternatives. With increased public access comes increased costs and impacts associated with security and fire prevention, habitat degradation, and potential diminution in water quality. The preferred alternative provides substantial opportunities for public recreation and education but would result in

lower levels of impact on water quality, watershed resources, and infrastructure (staffing) than under Alternative B. Alternative B would moderately respond to the primary goal of the Management Plan and most of the secondary goals of the Management Plan. Therefore, Alternative B in its entirety is rejected because it does not meet the goals and objectives identified by the SFPUC which govern the plan, and does not achieve the appropriate balance of primary and secondary goals sought by the SFPUC.

**Watershed Management Plan Alternative C:** Watershed Management Plan Alternative C is rejected because it would have the greatest impact on water quality and watershed resources. The increased public use and access allowed by Alternative C would result in the greatest number of new facilities and improvements, and the greatest level of management activities, fuel reduction and staffing to reduce the effects of greater public access on the watershed. Construction and operation of additional watershed facilities under Alternative C could result in natural resource impacts during construction and increased sedimentation and water quality degradation associated with runoff from construction areas. Increased public use of the watershed under Alternative C could result in an increase in unauthorized use that would turn increase the risks and hazards associated with wildfires, habitat degradation, and water quality degradation. Although Alternative C would include management

actions and mitigation measures similar to those under the preferred alternative in order to reduce impacts, given the extensive level of public use and grazing under this alternative, potential water quality, fire hazard, and natural resources impacts could be unavoidable. The preferred alternative provides substantial opportunities for public recreation and education but would result in lower levels of impact on water quality, watershed resources, funding and infrastructure (staffing) than under Alternative C. Alternative C would have only a moderate response to the primary goal of the Management Plan and a low to moderate response to most of the secondary goals. Therefore, Alternative C is rejected because it does not meet the goals and objectives identified by the SFPUC which govern the plan, and does not achieve the appropriate balance of primary and secondary goals sought by the SFPUC..

**No Action Alternative to Management Plan:** Without the Management Plan, the SFPUC could still propose changes in watershed management and propose new actions and projects. However, these would occur on an ad hoc, individual basis, without the encompassing policy framework provided by the Management Plan. The No Action Alternative was rejected for this reason. In addition, without the Management Plan, construction and operation of additional Watershed facilities could result in environmental impacts, such as natu-

ral resource impacts during construction and increased sedimentation and water quality degradation associated with runoff from construction areas and impervious surfaces. Under existing fuel management policies, constraints to the existing fire protection system would remain; therefore, the potential for catastrophic wildfire due to natural processes or illegal watershed use would continue. The No Action Alternative would not avoid the unavoidable significant associated with loss of prime agricultural land due to mining north of I-680 in accordance with SMP 29. However, the mined area (69 acres) would be less than the preferred alternative.

Under the No Action Alternative, implementation of management actions and mitigation measures on a project-by-project basis would likely reduce impacts to a less than significant level. However, implementation of these actions and measures would occur on an individual basis, without the comprehensive management strategies presented in the Management Plan. The Management Plan and program FEIR provide a foundation for the environmental analysis of future projects, leading to cost savings and management efficiencies that would not exist under the No Action Alternative. A Habitat Conservation Plan for threatened and endangered species within the watershed would not come into place, which would mean that there would be no umbrella planning document for the conservation and protection of these species and pro-

tection from possible “take” liability under the Endangered Species Act for ongoing SFPUC operations in the watershed. The No Action Alternative would have a low response to the primary goal of the Management Plan to maintain and improve source water quality, and a low to moderate response to most of the secondary goals of the Management Plan. Therefore, the No Action Alternative is rejected.

### **C. Development of Sunol Valley Resources Management Element Options (Mining in Sunol Valley).**

#### **1. Development of the Sunol Valley Resource Management Element Preferred Alternative.**

In resolution number 95-0073, the SFPUC directed the General Manager to incorporate a Resource Management Element for the Sunol Valley into the Watershed Management Plan. The Sunol Valley Resource Management Element was subsequently developed to guide the progress of mining in Sunol Valley over the next several decades. The SFPUC has leased acreage to aggregate mining companies since the 1970s. The mining to date has occurred south of I-680 and does not occur in the channel of Alameda Creek. Significant benefits to the SFPUC from aggregate mining operations include ongoing royalty revenues and future conversion of completed quarry pits into water storage reservoirs, along with the potential for water-based recreational opportunities

not available in the Primary Watershed.

The purpose of the Sunol Valley Resources Management Element of the Alameda Watershed Management Plan is to address the complex mix of activities in the Sunol Valley in a comprehensive manner, and to address the existing and future activities of the Sunol Valley while minimizing conflicts between these activities. These activities include potential potable and non-potable water storage; water quality protection; gravel operations and other revenue generating activities; SFPUC Alameda operations facilities, natural and cultural resources; fisheries enhancement; and potential recreation resources.

The Sunol Valley Resources Management Element is a conceptual, programmatic level study to determine the feasibility of developing water storage in the Sunol Valley. Exact configurations of the water storage reservoirs, water sources, piping layouts, recreation and other commercial activities and other related plan elements have not been determined. Many of these activities, if approved, may be subject to additional environmental analysis.

The overall goal of the Sunol Valley Resources Management Element is to optimize water storage for the SFPUC, thus increasing the yield and reliability of the water supply. Subgoals include managing the timing and location of quarry development to expedite creation of water storage while minimizing im-

pacts to natural, cultural and aesthetic resources, and maximizing revenues from leasing operations; protection of water quality in the future quarry reservoirs; investigation of the use of non-potable water in the quarry reservoirs; to analyze the impacts and mitigate as necessary any significant environmental impacts of the management plan; to develop a strategy for future leases, permits, and other agreements needed to implement the Sunol Valley Resources Management Element of the Alameda Watershed Management Plan; to involve interested agencies and the public in the planning process; and to inform and educate the public about water and other resource values.

Six Mining Alternatives A through F were developed under the Sunol Valley Resources Management Element. Subsequent to the selection of the preferred alternative by the SFPUC in resolution no. 96-0090, Sunol residents proposed Mining Alternative S, which was analyzed in the FEIR as being comparable to Mining Alternative B, because under both Mining Alternatives B and S no mining would take place north of I-680, and the area would be devoted to other land uses such as agriculture. The six Mining Alternatives would provide for varying degrees of mining in the Sunol Valley, with corresponding revenue and water storage benefits. A comparison of the proposed facilities and permitted activities under each of the Mining Alternatives is presented in FEIR table VII-3. The six Mining Alternatives A

through F are summarized below:

**Mining Alternative A** provides for the mining of existing permits and leases, with mining to occur south of I-680 in currently mined areas and north of I-680 in an area not currently mined under an existing 69 acre lease with Mission Valley Rock Company, authorized under Surface Mining Permit 29 issued by Alameda County. Mining Alternative A would permit the same level of mining allowed under the no action alternative in that previously entitled mining areas under lease from the SFPUC would be mined to completion by the year 2015. Five water storage reservoirs would result, with four reservoirs south of I-680 and one north of I-680. Total water storage under this alternative, with all pits mined to a 200 foot depth, would be 33,700 acre feet. Mining Alternatives A and C allow a greater variety of recreation activities upon completion of mining.

**Mining Alternatives B and S** provide for maximized mining and water storage south of I-680, with no mining north of I-680. San Antonio Creek would be mined under Mining Alternative B in order to create a large reservoir. Alternative S would not mine San Antonio Creek, and would therefore result in less water storage than Mining Alternative B, although mining would be extended closer to Calaveras Road on the north in an area that currently screens mining operations from view by nursery operations. Both Mining Alternatives B and

S propose recreational and agricultural activities north of I-680 to partially offset loss of mining revenues in this area. Both alternatives include four water storage reservoirs south of I-680. Expansion of mining activity under either Mining Alternative B or S is not covered under existing surface mining permits issued by Alameda County and may require environmental analysis prior to modification of these permits by the County. Under Mining Alternative B, the total volume of water storage upon completion of mining in approximately 2036 would be 51,800 acre feet; Mining Alternative S provides 47,100 acre feet.

**Mining Alternative C** maximizes water storage both north and south of I-680, with completion of mining south of I-680 before mining occurs north of I-680 and ultimate completion of mining in 2047. San Antonio Creek would not be mined under Mining Alternative C. Six water storage reservoirs would be created by this alternative, one north and five south of I-680. Expansion of mining activity under Mining Alternative C is not covered under existing surface mining permits issued by Alameda County and may require environmental analysis prior to modification of these permits by the County. Total water storage upon completion of mining under Mining Alternative C is 62,600 acre feet. Mining Alternatives A and C allow a greater variety of recreation activities upon completion of mining.

**Mining Alternative D** would allow mining to proceed in existing permit and lease areas north of I-680 (the 69 acre lease currently held by Mission Valley Rock Company). Mining and reclamation would be expedited in this area, and a conservation easement placed over the entire area following mining. Water storage would be maximized south of I-680; however, San Antonio Creek would not be mined. Expansion of mining activity under Mining Alternative D is not covered under existing surface mining permits issued by Alameda County and may require environmental analysis prior to modification of these permits by the County. Mining Alternative D adds areas north of Arroyo de la Laguna and south of the Hetch Hetchy Aqueduct to the planning area. A total of six water storage reservoirs would be created by this alternative, one north and five south of I-680. Total water storage upon completion of mining under Mining Alternative D is 52,300 acre feet.

**Mining Alternative E** includes mining north and south of I-680. Mining north of I-680 reflects the terms of Surface Mining Permit 32 (SMP 32) issued by Alameda County to Mission Valley Rock Company pursuant to the SMP 32 FEIR approved in 1995. Mining south of I-680 would be in accordance with existing surface mining permits and leases. San Antonio Creek would not be mined under Mining Alternative E. A total of five water storage reservoirs would be

created under this Alternative, one north and four south of I-680. Total water storage under this alternative is 53,100 acre feet.

**Mining Alternative F** includes mining north of I-680 in accordance with SMP 32, similar to Mining Alternative E, but provides a quarter-mile resource protection buffer from the recently restored Sunol Water Temple. The buffer area would consist of a mined area around the temple that would be backfilled and landscaped after completion; mining and reclamation would be expedited in this area in order to create additional usable area for recreation in the Temple vicinity. South of I-680 water storage would be maximized. Expansion of mining activity under Mining Alternative F south of I-680 is not covered under existing surface mining permits issued by Alameda County and may require environmental analysis prior to modification of these permits by the County. San Antonio Creek would not be mined under Mining Alternative F. A total of six water storage reservoirs would be created under this Alternative, one north and five south of I-680. Total water storage under this Alternative is 63,200 acre feet. Mining Alternative F provides the greatest amount of mining and potential water storage.

**2. Reasons for Selection of the Preferred Mining Alternative:** The SFPUC evaluated Mining Alternatives A through F and selected a preferred alternative on May 14, 1996. The preferred alter-

native north of I-680 is Mining Alternative F. South of I-680 the SFPUC selected two options, preferred mining alternative Options 1 and 2. Option 1 calls for working with Alameda County to amend the existing surface mining permits south of I-680 to extend the mining footprint to match the permit boundaries and increase mining depths to 200 feet. Option 2 seeks to increase the depth of mining south of I-680 to 200 feet without horizontally expanding the mining pits. Under both options south of I-680, Alameda County may need to conduct additional environmental analysis prior to approving modifications to the applicable surface mining permits.

The preferred alternative was selected by the SFPUC because it most closely achieves the realization of the primary and secondary goals of the Management Plan. The preferred alternative maximizes mining revenues and water storage, consistent with the secondary goals of the Management Plan and the goals of the Sunol Valley Resources Management Element. Mining operations proposed under the preferred mining alternative would have no significant impact on the quality of water provided by the SFPUC, consistent with the primary goal of the Management Plan. The preferred alternative further protects the cultural resources of the Sunol Water Temple and provides an additional landscaped area for recreation as part of the increased buffer zone around the Temple.

Although the revenue from other alternatives north of I-680 which do not include mining might offset a portion of the loss of mining royalties to the SFPUC, these alternatives will not produce the asset value of a completed water storage reservoir or additional water yield desired by the SFPUC. The SFPUC system needs additional water storage to meet existing and forecasted demands, and construction of new surface water reservoirs raises complicated environmental and permitting issues. At the program level, the use of completed surface mining pits for water storage in the actively mined Sunol Valley best provides water storage at the lowest cost and environmental impact.

### **3. Reasons for Rejection of Mining Plan Alternatives:**

Alternatives A through F were rejected for the following reasons:

- . Alternatives A, B, C, D and S would not provide the same level of water storage or royalty revenue from mining. The Water Supply Master Plan, the product of a partnership between the SFPUC and the organization representing its wholesale water customers, the Bay Area Water Users' Association, identified a need for an additional 71 million gallons per day (mgd) of firm system yield to meet projected demands of the SFPUC service area. Maximization of water storage via

quarrying under the preferred alternative in the Sunol Valley will satisfy an approximately 7 mgd portion of this demand without incurring the entire capital cost of building new surface water storage reservoirs. If the equivalent water storage were constructed elsewhere, the environmental impacts of such construction could be significant. In contrast, much of the Sunol Valley has been previously disturbed by mining.

- . Alternative B would induce significant impacts with the mining of the ephemeral channel of San Antonio Creek, which is considered a wildlife corridor by the California Department of Fish and Game. Current and proposed mining under the preferred alternative will not take place in stream channels.
- . Alternatives A, C, D and S are infeasible because of the high costs relating to reclamation arising out of the intensive recreational uses allowed under these alternatives. The Management Plan provides that ratepayer funds will not be used to subsidize recreational activities on the watershed. Public access to the future quarry reservoirs allowed under alternatives A, B, C and D could compromise the quality of water stored in the ponds, which would be inconsistent with the primary goal of the Management Plan. In addition, the SFPUC lacks suffi-

cient water supplies to devote more water to increased commercial agricultural uses in Sunol Valley, as suggested by alternatives A, B, D and S.

- . Alternatives E and F were rejected as individual alternatives, but were combined to form the preferred alternative, because the combination maximizes future water storage and revenues while providing further protection for the cultural resources and future recreation in the vicinity of the Sunol Water Temple. The water storage available to the SFPUC under the preferred alternative is needed for the entire region served by the SFPUC, and outweighs the loss of prime agricultural land caused by implementation of the preferred alternative. The preferred alternative best balances the primary and secondary goals of the Management Plan.

## V Mitigation Measures

CEQA requires agencies to adopt mitigation measures that would avoid or substantially lessen a project's identified significant impacts or potential significant impacts if such measures are feasible. The Alameda Watershed Management Plan proposes a series of actions over the 20 year life of the Plan. These Management Plan actions constitute best management practices that will improve water quality and the environmental resources of the Alameda

Watershed over baseline conditions. Whether or not these practices are implemented is dependent on whether the SFPUC receives funding and staffing for implementation of actions or sets of actions.

It is not possible at this time to determine which action or actions the SFPUC might undertake and in what timeframe. The FEIR took a conservative approach and identified potential environmental impacts for any proposed Management Plan action or project for which impacts could not be ruled out. It is the intention of the SFPUC to avoid significant impacts from any action or set of actions it may undertake in the future through the adoption of the mitigation measures identified in these findings. As actions are specifically proposed (or receive funding), the San Francisco Planning Department, Major Environmental Analysis section, would review the project specifics pursuant to CEQA Guidelines sections 15168 and 15162. The Mitigation Monitoring and Reporting Program attached hereto as Exhibit 2 specifies the process by which all adopted mitigation measures are to be carried out, along with responsibilities for enforcement. The Planning Department's Major Environmental Analysis section will also conduct an annual review of contemplated SFPUC actions, in addition to reviewing specific proposals from the SFPUC.

The findings in this section concern

mitigation measures set forth in the FEIR. These findings fall into two categories: (1) mitigation measures endorsed by the SFPUC for adoption exactly as proposed in the FEIR, and which can be implemented by SFPUC bureaus; and (2) mitigation measures proposed in the FEIR and endorsed by the SFPUC for adoption and which are enforceable by agencies other than the City. None of the mitigation measures is rejected completely.

The SFPUC finds that the measures it proposes for adoption can and should be carried out by the named bureau or agency at the designated time and are feasible at this time, based on the findings adopted by the SFPUC. To the extent that these measures require supplemental appropriations to SFPUC operating budgets, it is the SFPUC's intent to seek and obtain the necessary appropriations for implementation of the adopted mitigation measures in the event that the SFPUC approves implementation of a Management Plan action or set of actions during its annual budget process. No Management Plan action will be authorized by the SFPUC over the life of the Management Plan without the approval of the corresponding funding and implementation of required mitigation measures identified in the FEIR and any subsequently identified mitigation measures identified by Department of City Planning staff, unless subsequent project level environmental analysis determines such mea-

asures are unnecessary. The SFPUC finds that, based upon the record before it, the mitigation measures proposed for adoption can and should be carried out by the named bureaus and agencies at the appropriate time.

All of the mitigation measures discussed in the FEIR are coded and attached hereto as Exhibit 1. In the text of these findings, mitigation measures adopted by the SFPUC are referenced by the number and topic in Exhibit 1. Mitigation measures within the jurisdiction of other agencies are similarly referenced together with an indication of the appropriate jurisdiction. Mitigation measures are organized by subject matter in the same order that those subjects appear in the FEIR. For a description of the specific actions needed to mitigate a particular impact, please refer to FEIR Table II-1, Attachment A.

**A. Mitigation Measures Recommended by the SFPUC for Adoption as Proposed to be Implemented by SFPUC Bureaus and Departments.**

**1. Geology and Soils.** (See setting and impacts analysis at FEIR pages III.C-1-15)

C.1. In implementing any Management Plan management action that could result in significant physical effects to geology and soils through increased soil erosion, as shown in Table III.C-2 of the FEIR, ensure all applicable Management Plan management actions are

implemented that are necessary to reduce the impact to less-than-significant levels (see Table III.C-2, attached as Exhibit 3).

C.2. In implementing any Management Plan management action that could result in significant physical effects to geology and soils due to slope instability, as shown in Table III.C-3 of the FEIR, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to less-than-significant levels (see Table III.C-3, attached as Exhibit 4).

**2. Hydrology and Water Quality.** (See setting and impacts analysis at FEIR pages III.D-1-39).

D.1 In implementing any Management Plan action that could result in significant physical effects on water quality from an increase in public access and use, as shown in Table III.D-2, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-2, attached as Exhibit 5).

D.2 In implementing any Management Plan action that could result in significant physical effects on water quality from development of new facilities, as shown in Table III.D-3, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III. D-

3 attached as Exhibit 6).

D.3 In implementing any Management Plan action that could result in significant physical effects on water quality from watershed operations and maintenance activities, as shown in Table III.D-4, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-4, attached as Exhibit 7).

D.4 In implementing any Management Plan action that could result in significant physical effects on water quality from increased gravel mining activity, as shown in Table III.D-5, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-5, attached as Exhibit 8).

D.4.a Prior to approval of new or amended surface mining permits or mining leases for expansion of mining south of I-680, an independent study of Alameda Creek resources shall be completed by a qualified expert and approved by the Alameda County Planning Director and the SFPUC Watershed Manager. The study shall focus on potential impacts to groundwater and surface water hydrology and fish and wildlife species of special status concern from such future mining and shall propose mitigation measures applicable to mining, if warranted, to

avoid significant impacts. If warranted, such measures may include establishment of barriers to prevent adverse changes to groundwater or surface water hydrology and the resources supported by groundwater and surface water; special measures to avoid impacts to steelhead trout (if established in Alameda Creek) or other fisheries resources; and special measures to avoid impacts to listed species dependent on Alameda Creek for its riparian habitat or use as a migration corridor. All feasible mitigation measures shall be incorporated into future surface mining permits, conditions of approval and mining leases. The SFPUC recommends that the Alameda County Planning Agency implement this measure in surface mining permits for mining expansion south of I-680. Because this measure is partially within the jurisdiction of Alameda County, it is also listed under Article V.C.

D.5 In implementing any Management Plan action that could result in significant physical effects on water quality from nursery operations, as shown in Table III.D-6, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-6, attached as Exhibit 9).

D.6 In implementing any Management Plan action that could result in significant physical effects on water quality from expansion of golf course uses, as shown in Table III.D-7, ensure that all

applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-7, attached as Exhibit 10).

D.7 In implementing any Management Plan action that could result in significant physical effects on water quality from build up of sediments, as shown in Table III.D-8, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-8, attached as Exhibit 11).

**3. Natural Resources.** (See setting and impacts analysis at FEIR pages III.E-1-41).

E.1 In implementing any Management Plan action that could result in significant physical effects on natural resources from Watershed operations, maintenance, and construction activities, as shown in Table III.E-4, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-4, attached as Exhibit 12).

E.2 In implementing any Management Plan action that could result in significant physical effects on natural resources from an increase in public access and use, as shown in Table III.E-5, ensure that all applicable Management Plan management actions are implemented

that are necessary to reduce the impact to a less than significant level (see Table III.E-5, attached as Exhibit 13).

E.3 In implementing any Management Plan action that could result in significant physical effects on natural resources from an increase in invasive plant species, as shown in Table III.E-6, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-6, attached as Exhibit 14).

E.4 In implementing any Management Plan action that could result in significant physical effects on natural resources from improper administration of the 1997 grazing plan, as shown in Table III.E-7, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-7, attached as Exhibit 15).

E.5 In implementing any Management Plan action that could result in significant physical effects on natural resources from mining operations, as shown in Table III.E-8, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-8, attached as Exhibit 16).

E.5.a In new leases entitling mining,

require mining and reclamation operations to follow U.S. Fish and Wildlife Survey protocol for the Alameda whipsnake critical habitat designation. Protocols for the protection of the Alameda whipsnake have not yet been finalized. However, at a minimum, pre-construction surveys will be required, and will involve walking parallel transects 25 to 50 feet apart across the entire site. If found, snakes would be released into appropriate nearby habitat. The area of disturbance in any mining operation within designated critical habitat will be enclosed in snake-proof fencing.

E.5.b For proposed mining and reclamation operations north and south of I-680, require operators to have surveys conducted by a qualified biologist within storage pit ponds and other basins that store water at proposed mining and reclamation areas on an annual basis. Surveys would be completed for all life cycle stages of the California red-legged frog (e.g. egg masses, tadpole, juveniles, adults) and California tiger salamander. If no California red-legged frogs or California tiger salamanders are detected during these surveys, then mining operations shall continue within the survey area. If adult red-legged frogs or tadpoles or California tiger salamanders are found within specific bodies of water undergoing mining or reclamation, mining and reclamation shall cease in the specific pit or pond or other basins where the frogs and salamanders have been found. The frogs or salamanders

would immediately be moved passively, or captured and moved, to suitable upstream sites by a biologist with the appropriate permits. Mining and reclamation may continue upon completion of the work by the biologist.

E.5.c Require mining operators north and south of I-680 to have the area surrounding storage pit ponds and other basins that store water routinely maintained clear of vegetation.

E.5.d Require mining operators to implement mitigation measure D-3, a-d of the Mission Valley Rock Company Surface Mining Permit and Reclamation Plan SMP 32, Final Environmental Impact Report, which avoids or minimizes impacts to wildlife. Mitigation measures b and c shall be applied to proposed mining and reclamation operations south of I-680 as well. These measures are as follows:

- a) The quarry operator should incorporate revised landscaping and buffering plans to include a hay/grain field over the majority of the buffer (approximately 100 acres), with the possible exception of the I-680 frontage and the landscape berms and hillocks.
- b) Winter and spring surveys would be conducted to confirm or deny the presence of California tiger salamanders and burrowing owls. If the species are present, additional off-site habitat should be preserved and/or enhanced at a 1:1 ratio (1 acre

preserved for 1 acre developed). On-site habitat would include the project setbacks with the exception of the vineyard north of I-680. Off-site habitat would be identified in coordination with the California Department of Fish and Game (CDFG) and the SFPUC.

c) Preconstruction surveys for burrowing owls should be conducted within each module prior to each state of topsoil disturbance and overburden removal to confirm or deny the presence of the species. If present, the species may be moved through passive relocation per approved CDFG procedures. This would include creating an artificial burrow complex and closing off each pair's den.

**4. Air Quality.** (See setting and impacts analysis at FEIR pages III.F-1-17).

F.1 In implementing any Management Plan management action that could result in significant physical effects on air quality from an increase in construction activities, as shown in Table III.F-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.F-3, attached as Exhibit 17).

**5. Fire Management.** (See setting and impacts analysis at FEIR pages III.G-1-15).

G.1 In implementing any Management Plan management action that could result in significant physical effects with respect to fire hazard from reduction of existing fuel breaks, as shown in Table III.G-1, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-1, attached as Exhibit 18).

G.2 In implementing any Management Plan management action that could result in significant physical effects on fire management from increased public access and use, as shown in Table III.G-2, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-2, attached as Exhibit 19).

G.3 In implementing any Management Plan management action that could result in significant physical effects from use of prescribed burns, as shown in Table III.G-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-3, attached as Exhibit 20).

**6. Cultural Resources.** (See setting and impacts analysis at FEIR pages III.H-1-18).

H.1 In implementing any Management Plan management action that could re-

sult in significant physical effects on cultural resources from increased public access and use, as shown in Table III.H-2, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.H-2, attached as Exhibit 21).

H.2 In implementing any Management Plan management action that could result in significant physical effects on cultural resources from operations, maintenance, and construction activities, as shown in Table III.H-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.H-3, attached as Exhibit 22).

H.2.a Ensure that any alteration of identified historic resources takes place in accordance with the Secretary of Interior's Standards for Treatment of Historic Properties.

H.2.b Prohibit the demolition or removal of historic structures.

**7. Aesthetics.** (See setting and impacts analysis at FEIR pages III.I-1-13).

I.1 In implementing any Management Plan management action that could result in significant physical effects on aesthetic quality through installation of new facilities, as shown in Table III.I-1, ensure all applicable Management Plan management actions are implemented

that are necessary to reduce the impact to a less than significant level (see Table III.I-1, attached as Exhibit 23).

I.2 In implementing any Management Plan management action that could result in significant physical effects on aesthetic quality through vegetation clearing activities, as shown in Table III.I-2, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.I-2, attached as Exhibit 24).

I.3 In implementing any Management Plan management action that could result in significant physical effects on aesthetic quality through increased public access and use, as shown in Table III.I-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.I-3, attached as Exhibit 25).

**8. Transportation and Access.** (See setting and impacts analysis at FEIR pages III.J-1-7).

J.1 In implementing any Management Plan management action that could result in significant physical effects to transportation and access through development of Sunol Valley recreational facilities, as shown in Table III.J-1, ensure all applicable Management Plan management actions are implemented

that are necessary to reduce the impact to a less than significant level (see Table III.J-1, attached as Exhibit 25A).

J.2 As part of the design of new public facilities, include a parking plan developed in coordination with Alameda County to provide sufficient parking spaces to avoid unacceptable vehicle/pedestrian hazard. In addition, the SFPUC will monitor the area surrounding new public facilities and report illegal parking to the Alameda County Sheriff’s Department for enforcement. Because this measure is partially within the jurisdiction of Alameda County, it is also listed under Article V.C.

**9. Utilities and Public Services.** (See setting and impacts analysis at FEIR pages III.K-1-8).

No potentially significant or significant impacts were identified in the FEIR, and no mitigation is required.

**10. Noise.** (See setting and impacts analysis at FEIR pages III.L-1-11).

L.1 In implementing any Management Plan management action that could result in significant physical effects on noise levels through SFPUC construction activities, Table III.L-1, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.L-1, attached as Exhibit 25B).

L.2 Limit construction activities near sensitive receptors to the hours and days specified by the *Alameda County General Plan Noise Element* (generally between 9 a.m. and 6 p.m., Monday-Friday).

L.3 Require in construction specifications that the contractor select staging areas as far as feasibly possible from existing sensitive land uses. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure L.1, above.

L.4 Require in construction specifications that the contractor maintain all construction equipment with manufacturers’ specified noise-muffling devices.

L.5 Require in construction specifications that the contractor maintain all stationary noise-generating construction equipment as far away as feasibly possible from sensitive receptors or in an orientation that reduces minimizes noise impacts (i.e., behind existing barriers or storage piles, etc.).

**11. Hazardous Materials and Hazardous Waste.** (See setting and impacts analysis at FEIR pages III.M.1-12).

M.1 In implementing any Management Plan management action that could result in significant physical effects from construction-related exposure to hazardous materials and hazardous waste, as shown in Table III.M-1, ensure all applicable Management Plan manage-

ment actions are implemented that are necessary to reduce the impact (see Table III.M-1, attached as Exhibit 26).

M.2 In implementing any Management Plan management action that could result in significant physical effects from operations-related exposure to hazardous materials and hazardous waste, as shown in Table III.M-2, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact (see Table III.M-2, attached as Exhibit 27).

M.2.a Prior to any significant soil disturbance or excavation in areas with a history of uses that could have generated hazardous wastes, conduct an analysis of the soil for hazardous wastes. Where hazardous wastes are found in excess of state or federal standards, submit a site mitigation plan and worker safety plan to the Alameda County or Santa Clara County Department of Environmental Health for approval. Implement the approved site mitigation plan and worker safety plan prior to site grading or other soil disturbance. If toxics are found for which no standards are established, request a determination from the Alameda or Santa Clara County Department of Environmental Health or the state or federal agency with jurisdiction as to whether site mitigation is needed. Because this measure is partially within the jurisdiction of Alameda and/or Santa Clara County, it is also listed under Article V.C.

**12. Energy.** (See setting and impacts analysis at FEIR pages III.N-1-3).

No potentially significant or significant impacts were identified in the FEIR, and no mitigation is required.

**13. Growth Inducement.** (See setting and impacts analysis at FEIR page III.O-1).

No potentially significant or significant impacts were identified in the FEIR, and no mitigation is required.

**B. Mitigation Measures Within the Jurisdiction of a Non-City Agency.**

D.4.a Prior to approval of new or amended surface mining permits or mining leases for expansion of mining south of I-680, an independent study of Alameda Creek resources shall be completed by a qualified expert and approved by the Alameda County Planning Director and the SFPUC Watershed Manager. The study shall focus on potential impacts to groundwater and surface water hydrology and fish and wildlife species of special status concern from such future mining and shall propose mitigation measures applicable to mining, if warranted, to avoid significant impacts. If warranted, such measures may include establishment of barriers to prevent adverse changes to groundwater or surface water hydrology and the resources supported by groundwater and surface water; special measures to avoid impacts to steelhead

trout (if established in Alameda Creek) or other fisheries resources; and special measures to avoid impacts to listed species dependent on Alameda Creek for its riparian habitat or use as a migration corridor. All feasible mitigation measures shall be incorporated into future surface mining permits, conditions of approval and mining leases. The SFPUC recommends that the Alameda County Planning Agency implement this measure in surface mining permits for mining expansion south of I-680. Because this measure is partially within the jurisdiction of the SFPUC, it is also listed under Article VA.

J.1 As part of the design of new public facilities, include a parking plan developed in coordination with Alameda County to provide sufficient parking spaces to avoid unacceptable vehicle/pedestrian hazard. In addition, the SFPUC will monitor the area surrounding new public facilities and report illegal parking to the Alameda County Sheriff's Department for enforcement. Because this measure is partially within the jurisdiction of Alameda County, it is also listed under Article VA.

M.2.a Prior to any significant soil disturbance or excavation in areas with a history of uses that could have generated hazardous wastes, conduct an analysis of the soil for hazardous wastes. Where hazardous wastes are found in excess of state or federal standards, submit a site mitigation plan and worker safety plan to the Alameda County or

Santa Clara County Department of Environmental Health for approval. Implement the approved site mitigation plan and worker safety plan prior to site grading or other soil disturbance. If toxics are found for which no standards are established, request a determination from the Alameda or Santa Clara County Department of Environmental Health or the state or federal agency with jurisdiction as to whether site mitigation is needed. Because this measure is partially within the jurisdiction of Alameda and/or Santa Clara County, it is also listed under Article VA.

**C. Adoption of a Mitigation Monitoring Program.**

The SFPUC hereby adopts a Mitigation Monitoring Program as required by Section 21081.6 of the Public Resources Code. This Mitigation Monitoring Program is attached hereto as Exhibit 2 and incorporated herein by reference. The purpose of this Program is to determine the stage at which each of the adopted mitigation measures must be imposed in order to ensure that the measure is carried out by the responsible official or entity.

**D. Location and Custodian of Record.**

The public review transcript, a copy of all letters regarding the FEIR received during the public review period, the administrative record, and background documentation for the FEIR are located at the Planning Department, 1660 Mis-

sion Street, San Francisco. The Planning Department, Dorothy Jaymes, is the custodian of record.

## **VI Significant Environmental Impacts**

For implementation of many proposed Alameda Watershed Management Plan policies and management actions, their environmental effects are analyzed in sufficient detail to allow the FEIR to fully satisfy CEQA. For example, the impacts of day-to-day management activities that implement the Management Plan are analyzed in the FEIR and will generally not be subject to further environmental review. At a program-level, all potential significant impacts except loss of prime agricultural land (discussed below) would be reduced to a less than significant level with the implementation of the mitigation measures listed in Article V above.

The mitigation measures described above would reduce to a level of insignificance the following impacts, as described in the referenced FEIR pages: Geology and Soils (p. IV-2); Hydrology and Water Quality (pp. IV-2-3); Natural Resources (pp. IV-3-4); Air Quality (p. IV-4); Fire Management (p. IV-5); Cultural Resources (p. IV-5); Aesthetics (p. IV-6); Transportation and Access (p. IV-6); Noise (P. IV-7); and Hazardous Materials and Hazardous Waste (pp. IV-7-8). The mitigation measures identified in the FEIR would not avoid or reduce to a level of insignificance the fol-

lowing:

Actions proposed in the Management Plan for mining north of I-680 would take place substantially in accordance with limits and mitigations set forth in Alameda County's conditions of approval for Surface Mining Permit (SMP) 32. As described in the SMP 32 EIR, permitted mining under SMP-32 would bring about the loss of 140 acres of prime agricultural lands. The EIR for SMP-32 found this loss of prime agricultural land to be an unavoidable significant impact of that project, and implementation of the Management Plan would include approval of a new mining lease between SFPUC (as land owner) and the mining operator, entitling mining that would also lead to the unavoidable significant impact.

The two options proposed in the Management Plan for mining south of I-680 would require amendments to existing mining permits (SMP-24 and SMP-30). It may reasonably be assumed that Alameda County would apply conditions of approval to the permit modifications consistent with those applied to SMP-24, SMP-30, and more recent permits such as SMP-32 that mitigate significant effects of mining. The increase in mining depths proposed in both mining options (Management Plan Actions *sun2a* and *sun2b*) would not be likely to result in impacts beyond levels previously analyzed and mitigated in previous environmental documentation. Expanding the mining footprint within the leased area, proposed

under Action *sun2a*, could conflict with some existing nursery operations in the valley. However, the conflict would not likely be significant due to the extent of existing adjacent mining activities (including gravel processing plants and reclamation pits). Depending on the location and amount of horizontal expansion of the mining footprint proposed under Action *sun2a*, a significant loss of prime agricultural land could occur. Amendment of the existing Surface Mining Permits may be subject to project-level environmental review by Alameda County to examine in more detail the potential for significant effects and to identify mitigation measures if warranted to reduce or avoid significant effects.

## **VII Statement of Overriding Considerations**

Notwithstanding the significant effect noted above, pursuant to CEQA Section 21081(b), the CEQA Guidelines, and Chapter 31 of the San Francisco Administrative Code, the SFPUC finds, after considering the FEIR, that specific overriding economic, legal, social and other considerations, as set forth below, outweigh the identified significant effect on the environment of loss of 140 acres of prime agricultural land. In addition, the SFPUC finds that those Project Alternatives either partially or totally rejected, are also rejected for the specific economic, social or other considerations, in and of themselves, in addition to the specific reasons discussed in Article IV above.

1. The Sunol Valley Resources Management Element of the Alameda Watershed Management Plan enables the SFPUC to maximize revenues from mining lease revenues while also maximizing the future water storage potential of the completed quarry pits. The SFPUC requires additional water storage to meet forecasted water demand within the SFPUC service area. The additional firm yield (storage) provided by the preferred mining alternative will supply approximately 10% of the required firm yield of 71 million gallons per day. The loss of agricultural land resulting from mining is offset by significant benefits to over 2.5 million customers of the SFPUC system in the form of increased future water storage. Development of quarry reservoirs in the Sunol Valley, much of which has already been disturbed from mining, is environmentally preferable to locating an equivalent volume of new surface water storage in an undisturbed area.

2. The SFPUC lacks the resources to devote additional water to agricultural use given the shortage of water for domestic and industrial use in the SFPUC service area to meet existing and forecasted demands. The 140 acres of agricultural land at the SMP 32 site are currently used primarily for hay growing and a small vineyard. If the land were preserved as agricultural in character, there is no water available for more intensive agricultural uses suggested by plan alternatives (e.g. organic farming, vineyards, etc.) which would bring in

additional revenues to partially offset the loss of mining royalty revenue to the SFPUC. The SFPUC recently informed Alameda County that it had no water to spare to further a proposed Sunol Valley Agricultural Enhancement zoning change for creation of 20 acre agricultural parcels for vineyards and other uses.

3. The completed quarry pits will function as water storage reservoirs at little additional cost to SFPUC ratepayers at a time when new surface water storage costs approximately \$2,000 an acre foot to construct, assuming additional storage could be constructed in the face of increasingly stringent environmental protection laws. The proposed 16,000 acre foot reservoir north of I-680 created by the preferred mining alternative will have an asset value of \$32 million upon completion, in addition to the millions of dollars in royalty revenues generated over the life of the mining lease. These mining revenues are considered non-operating revenue under the SFPUC's 1984 contract with its suburban wholesale water customers, and non-operating revenues can be devoted to projects that solely benefit San Francisco ratepayers. Mining and other lease revenues are available to offset the cost of water system maintenance and development in San Francisco at a time when the SFPUC projects hundreds of millions of dollars in capital expenditures for maintenance and reliability purposes.

4. The preferred mining alternative incorporates Alameda County's SMP 32 conditions of approval for the relocation of the existing vineyard on the site, and provides further opportunities for public access and recreation in the vicinity of the Sunol Temple. The SFPUC in addition has other lands available which could be used for agriculture which do not have significant aggregate resources, assuming a source of water could be found to irrigate these lands.

5. The proposed expansion of mining south of I-680 will occur adjacent to existing quarry pits in previously disturbed areas. Continued mining in Sunol Valley will potentially defer the start of mining at the permitted Apperson Ridge Quarry in the San Antonio Watershed, which could have major environmental impacts on natural resources and water quality of the primary watershed above San Antonio Reservoir.

6. The SFPUC's selection of an Alameda Watershed Management Plan preferred alternative involved a balancing of the Plan's primary and secondary goals in order to achieve the sought after environmental benefits of implementing the plan while addressing other considerations – legal, social, environmental, economic, and technical – that have a bearing on the SFPUC's management of the Alameda Watershed. The SFPUC finds that the preferred Watershed Management Plan alternative, and

the preferred Sunol Valley Resources Management Plan alternative, best address the realization of the Plan’s primary and secondary goals in a fashion consistent with prudent utility system management.

Having considered these Project benefits, including the benefits discussed in Article IV.A through C, the SFPUC finds that the benefits of the Project outweigh the unavoidable adverse environmental effects, and that the adverse environmental effects are therefore acceptable.

**EXHIBIT 1  
LIST OF MITIGATION MEASURES**

**A. Mitigation Measures Recommended by the SFPUC for Adoption as Proposed to be Implemented by SFPUC Bureaus and Departments.**

**1. Geology and Soils.** (See setting and impacts analysis at FEIR pages III.C-1-15)

C.1. In implementing any Management Plan management action that could result in significant physical effects to geology and soils through increased soil erosion, as shown in Table III.C-2 of the FEIR, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to less-than-significant levels (see Table III.C-2, attached as Exhibit 3).

C.2. In implementing any Management Plan management action that could result in significant physical effects to geology and soils due to slope instability, as shown in Table III.C-3 of the FEIR, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to less-than-significant levels (see Table III.C-3, attached as Exhibit 4).

**2. Hydrology and Water Quality.** (See setting and impacts analysis at FEIR pages III.D-1-39).

D.1 In implementing any Management Plan action that could result in significant physical effects on water quality from an increase in public access and use, as shown in Table III.D-2, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-2, attached as Exhibit 5).

D.2 In implementing any Management Plan action that could result in significant physical effects on water quality from development of new facilities, as shown in Table III.D-3, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-3, attached as Exhibit 6).

D.3 In implementing any Management Plan action that could result in signifi-

cant physical effects on water quality from watershed operations and maintenance activities, as shown in Table III.D-4, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-4, attached as Exhibit 7).

D.4 In implementing any Management Plan action that could result in significant physical effects on water quality from increased gravel mining activity, as shown in Table III.D-5, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-5, attached as Exhibit 8).

D.4.a Prior to approval of new or amended surface mining permits or mining leases for expansion of mining south of I-680, an independent study of Alameda Creek resources shall be completed by a qualified expert and approved by the Alameda County Planning Director and the SFPUC Watershed Manager. The study shall focus on potential impacts to groundwater and surface water hydrology and fish and wildlife species of special status concern from such future mining and shall propose mitigation measures applicable to mining, if warranted, to avoid significant impacts. If warranted, such measures may include establishment of barriers to prevent adverse changes to groundwater or surface water hydro-

logy and the resources supported by groundwater and surface water; special measures to avoid impacts to steelhead trout (if established in Alameda Creek) or other fisheries resources; and special measures to avoid impacts to listed species dependent on Alameda Creek for its riparian habitat or use as a migration corridor. All feasible mitigation measures shall be incorporated into future surface mining permits, conditions of approval and mining leases. The SFPUC recommends that the Alameda County Planning Agency implement this measure in surface mining permits for mining expansion south of I-680. Because this measure is partially within the jurisdiction of Alameda County, it is also listed under Article V.C.

D.5 In implementing any Management Plan action that could result in significant physical effects on water quality from nursery operations, as shown in Table III.D-6, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-6, attached as Exhibit 9).

D.6 In implementing any Management Plan action that could result in significant physical effects on water quality from expansion of golf course uses, as shown in Table III.D-7, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-

7, attached as Exhibit 10).

D.7 In implementing any Management Plan action that could result in significant physical effects on water quality from build up of sediments, as shown in Table III.D-8, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-8, attached as Exhibit 11).

**3. Natural Resources.** (See setting and impacts analysis at FEIR pages III.E-1-41).

E.1 In implementing any Management Plan action that could result in significant physical effects on natural resources from Watershed operations, maintenance, and construction activities, as shown in Table III.E-4, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-4, attached as Exhibit 12).

E.2 In implementing any Management Plan action that could result in significant physical effects on natural resources from an increase in public access and use, as shown in Table III.E-5, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-5, attached as Exhibit 13).

E.3 In implementing any Management Plan action that could result in significant physical effects on natural resources from an increase in invasive plant species, as shown in Table III.E-6, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-6, attached as Exhibit 14).

E.4 In implementing any Management Plan action that could result in significant physical effects on natural resources from improper administration of the 1997 grazing plan, as shown in Table III.E-7, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-7, attached as Exhibit 15).

E.5 In implementing any Management Plan action that could result in significant physical effects on natural resources from mining operations, as shown in Table III.E-8, ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-8, attached as Exhibit 16).

E.5.a In new leases entitling mining, require mining and reclamation operations to follow U.S. Fish and Wildlife Survey protocol for the Alameda whipsnake critical habitat designation. Protocols for the protection of the

Alameda whipsnake have not yet been finalized. However, at a minimum, pre-construction surveys will be required, and will involve walking parallel transects 25 to 50 feet apart across the entire site. If found, snakes would be released into appropriate nearby habitat. The area of disturbance in any mining operation within designated critical habitat will be enclosed in snake-proof fencing.

E.5.b For proposed mining and reclamation operations north and south of I-680, require operators to have surveys conducted by a qualified biologist within storage pit ponds and other basins that store water at proposed mining and reclamation areas on an annual basis. Surveys would be completed for all life cycle stages of the California red-legged frog (e.g. egg masses, tadpole, juveniles, adults) and California tiger salamander. If no California red-legged frogs or California tiger salamanders are detected during these surveys, then mining operations shall continue within the survey area. If adult red-legged frogs or tadpoles or California tiger salamanders are found within specific bodies of water undergoing mining or reclamation, mining and reclamation shall cease in the specific pit or pond or other basins where the frogs and salamanders have been found. The frogs or salamanders would immediately be moved passively, or captured and moved, to suitable upstream sites by a biologist with the appropriate permits. Mining and reclamation may continue upon completion

of the work by the biologist.

E.5.c Require mining operators north and south of I-680 to have the area surrounding storage pit ponds and other basins that store water routinely maintained clear of vegetation.

E.5.d Require mining operators to implement mitigation measure D-3, a-d of the Mission Valley Rock Company Surface Mining Permit and Reclamation Plan SMP 32, Final Environmental Impact Report, which avoids or minimizes impacts to wildlife. Mitigation measures b and c shall be applied to proposed mining and reclamation operations south of I-680 as well. These measures are as follows:

a) The quarry operator should incorporate revised landscaping and buffering plans to include a hay/grain field over the majority of the buffer (approximately 100 acres), with the possible exception of the I-680 frontage and the landscape berms and hillocks.

b) Winter and spring surveys would be conducted to confirm or deny the presence of California tiger salamanders and burrowing owls. If the species are present, additional off-site habitat should be preserved and/or enhanced at a 1:1 ratio (1 acre preserved for 1 acre developed). On-site habitat would include the project setbacks with the exception of the vineyard north of I-680. Off-site habitat would be identified in coordination with the California Depart-

ment of Fish and Game (CDFG) and the SFPUC.

c) Preconstruction surveys for burrowing owls should be conducted within each module prior to each state of topsoil disturbance and overburden removal to confirm or deny the presence of the species. If present, the species may be moved through passive relocation per approved CDFG procedures. This would include creating an artificial burrow complex and closing off each pair's den.

**4. Air Quality.** (See setting and impacts analysis at FEIR pages III.F-1-17).

F.1 In implementing any Management Plan management action that could result in significant physical effects on air quality from an increase in construction activities, as shown in Table III.F-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.F-3, attached as Exhibit 17).

**5. Fire Management.** (See setting and impacts analysis at FEIR pages III.G-1-15).

G.1 In implementing any Management Plan management action that could result in significant physical effects with respect to fire hazard from reduction of existing fuel breaks, as shown in Table

III.G-1, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-1, attached as Exhibit 18).

G.2 In implementing any Management Plan management action that could result in significant physical effects on fire management from increased public access and use, as shown in Table III.G-2, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-2, attached as Exhibit 19).

G.3 In implementing any Management Plan management action that could result in significant physical effects from use of prescribed burns, as shown in Table III.G-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-3, attached as Exhibit 20).

**6. Cultural Resources.** (See setting and impacts analysis at FEIR pages III.H-1-18).

H.1 In implementing any Management Plan management action that could result in significant physical effects on cultural resources from increased public access and use, as shown in Table III.H-2, ensure all applicable Management Plan management actions are imple-

mented that are necessary to reduce the impact to a less than significant level (see Table III.H-2, attached as Exhibit 21).

H.2 In implementing any Management Plan management action that could result in significant physical effects on cultural resources from operations, maintenance, and construction activities, as shown in Table III.H-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.H-3, attached as Exhibit 22).

H.2.a Ensure that any alteration of identified historic resources takes plac



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## 7.3 Mitigation Monitoring and Reporting Program

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### 7.3.1 Overview

As required by the California Environmental Quality Act (CEQA), the SFPUC has developed a Mitigation Monitoring and Reporting Program for its Alameda Watershed Management Plan. The purpose of the Mitigation Monitoring and Reporting Program is to ensure that the mitigation measures identified in the Final Environmental Impact Report for Alameda Watershed Management Plan (FEIR) are implemented, thus avoiding significant environmental effects (CEQA Guidelines, Section 15097).

On the following pages, several mitigation measures have similar entries under *Mitigation Schedule and Monitoring Action/Schedule*. The information contained in those entries is provided below and this information is referred to throughout the Program.

### 7.3.2 Mitigation Schedule

The mitigation schedule of the Mitigation Monitoring and Reporting Program is dependent on the timing of a particular action over the life of the Alameda Watershed Management Plan. These mitigation measures consist of other actions and policies from the Plan that are designed to reduce or minimize adverse impacts. These actions and policies are generally best management practices or specific improvement

projects designed for environmental protection that would be implemented in combination with other policies and set forth in the tables referred to in the schedule. These tables are derived from the appropriate impact section of the FEIR and are attached to the Mitigation Monitoring and Reporting Program as exhibits.

Some of the actions and policies designed as mitigation measures may also have the potential to create significant environmental impacts, requiring the implementation of further actions and policies to mitigate these impacts. A draft report on file with the SFPUC entitled *Mitigation Measures Derived from Management Actions and Policies* reformats the tables in Chapter III of the (FEIR) so that all related management actions and policies, and associated mitigation measures, are grouped together. This report shows the full extent of the required implementation of mitigating policies and actions.

### 7.3.3 Monitoring Actions/Schedule

As projects are proposed and initiated, review by SFPUC staff of the Land and Resources Management Section (LRMS) would take place pursuant to several management actions in the Alameda Watershed Management Plan, notably Action env3 and des5. For new projects

and ongoing maintenance activities, these management plan actions require consultation with an LRMS staff member to ensure that environmental concerns, mitigation measures, and design guidelines are implemented as a part of project approval. For projects referred to the Major Environmental Analysis Section of the Department of City Planning under provisions of the San Francisco Administrative Code, the initial review by LRMS staff will serve to inform the City's environmental review officer about the potential impacts of a proposed project analyzed at the program level in the FEIR and to determine what additional environmental analysis is required.

Personnel with access to the watershed would be trained regarding environmental compliance measures required by the Plan, and a watershed field manual describing these procedures would be issued to personnel with access to the watershed.

A draft report on file with the SFPUC entitled *Mitigation Measures Derived from Management Actions and Policies* reformats the tables in Chapter III of the FEIR so that all related management actions and policies, and associated mitigation measures, are grouped together. This report shows the full extent of the required implementation of mitigating policies and actions.



**EXHIBIT 2**

**ALAMEDA WATERSHED MANAGEMENT PLAN FEIR  
MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<b>1. Geology and Soils<sup>1</sup></b>				
C.1. In implementing any Management Plan management action (“Management Action”) that could result in significant physical effects to geology and soils through increased soil erosion, as shown in Table III.C-2, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to less-than-significant levels (see Table III.C-2, attached as Exhibit 3).	SFPUC	See page 1 (Overview) for further information on the mitigation schedule and Table III.C-2 (Management Actions that Could Result in Significant Physical Effects to Geology and Soils through Increases in Soil Erosion) attached as Exhibit 3. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.	SFPUC in consultation with SF City Planning (MEA)	See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.
C.2. In implementing any Management Action that could result in significant physical effects to geology and soils due to slope instability, as shown in Table III.C-3, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to less-than-significant levels (see Table III.C-3, attached as Exhibit 4).	SFPUC	See page 1 (Overview) for further information on the mitigation schedule and Table III.C-3 (Management Actions that Could Result in Significant Physical Effects to Geology and Soils Due to Slope Instability) attached as Exhibit 4. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.	SFPUC in consultation with SF City Planning (MEA)	See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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**ALAMEDA WATERSHED MANAGEMENT PLAN FEIR  
MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p><b>2. Hydrology and Water Quality<sup>1</sup></b></p>				
<p>D.1. In implementing any Management Action that could result in significant physical effects on water quality due to increased public access and use, as shown in Table III.D-2, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-2, attached as Exhibit 5).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.D-2 (Summary of Potentially Significant Water Quality Impacts Due to Increased Public Access and Use) attached as Exhibit 5. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>D.2. In implementing any Management Action that could result in significant physical effects on water quality due to development of new facilities, as shown in Table III.D-3, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-3, attached as Exhibit 6).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.D-3 (Summary of Potentially Significant Water Quality Impacts Due to Development of New Facilities) attached as Exhibit 6. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR

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**ALAMEDA WATERSHED MANAGEMENT PLAN FEIR  
MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>D.3 In implementing any Management Action that could result in significant physical effects on water quality due to watershed operations and maintenance activities, as shown in Table III.D-4, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-4, attached as Exhibit 7).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.D-4 (Summary of Potentially Significant Water Quality Impacts Due to Watershed Operations and Maintenance Activities) attached as Exhibit 7. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>D.4 In implementing any Management Action that could result in significant physical effects on water quality due from increased gravel mining activity, as shown in Table III.D-5, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-5, attached as Exhibit 8).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.D-5 (Summary of Potentially Significant Water Quality Impacts Due to Changes or Increases to Gravel Mining Operations) attached as Exhibit 8. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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**ALAMEDA WATERSHED MANAGEMENT PLAN FEIR  
MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>D.4.a Prior to approval of new or amended surface mining permits or mining leases for expansion of mining south of I-680, an independent study of Alameda Creek resources shall be completed by a qualified expert and approved by the Alameda County Planning Director and the SFPUC Watershed Manager. The study shall focus on potential impacts to groundwater and surface water hydrology and fish and wildlife species of special status concern from such future mining and shall propose mitigation measures applicable to mining, if warranted, to avoid significant impacts. If warranted, such measures may include establishment of barriers to prevent adverse changes to groundwater or surface water hydrology and the resources supported by groundwater and surface water; special measures to avoid impacts to steelhead trout (if established in Alameda Creek) or other fisheries resources; and special</p>	<p>1) SFPUC 2) Alameda County Planning Department</p>	<p>Prior to approval of new or amended surface mining permits: 1) Complete Alameda Creek resources study, including review and approval by Alameda County Planning Director and SFPUC Watershed Manager; and 2) Complete further environmental review as needed, including the incorporation of mitigation measures (if any) from the Alameda Creek resources study into the project.</p>	<p>1) SFPUC 2) Alameda County Planning Department 3) SF Planning Department (MEA) 4) Resource Agencies (USFWS, CDFG)</p>	<p>1) SFPUC Watershed Mgr. and Alameda Co. Planning Director to review and approve Alameda Creek resources study. 2) Alameda County to act as lead agency on further environmental review (as needed) and issuance of subsequent surface mining permit(s) in consultation with SF Planning Dept. (MEA). 3) Resource agencies to review and comment on environmental documents.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>measures to avoid impacts to listed species dependent on Alameda Creek for its riparian habitat or use as a migration corridor. All feasible mitigation measures shall be incorporated into future surface mining permits, conditions of approval and mining leases. The SFPUC recommends that the Alameda County Planning Agency implement this measure in surface mining permits for mining expansion south of I-680.</p>				
<p>D.5. In implementing any Management Action that could result in significant physical effects on water quality due to nursery operations, as shown in Table III.D-6, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-6, attached as Exhibit 9).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.D-6 (Summary of Potentially Significant Water Quality Impacts Due to Nursery Operations) attached as Exhibit 9. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	SFPUC in consultation with SF City Planning (MEA)	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>

<sup>†</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>D.6. In implementing any Management Action that could result in significant physical effects on water quality due to expansion of golf course uses, as shown in Table III.D-7, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-7, attached as Exhibit 10).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.D-7 (Summary of Potentially Significant Water Quality Impacts Due to Water Quality from Expansion of Golf Course Uses) attached as Exhibit 10. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>D.7. In implementing any Management Action that could result in significant physical effects on water quality due to build up of sediments, as shown in Table III.D-8, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.D-8, attached as Exhibit 11).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.D-8 (Management Actions that Could Result in Significant Physical Effects Due to Build Up of Sediments) attached as Exhibit 11. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p><b>3. Natural Resources<sup>1</sup></b></p>				

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>E.1 In implementing any Management Action that could result in significant physical effects on natural resources from Watershed operations, maintenance, and construction activities, as shown in Table III.E-4, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-4, attached as Exhibit 12).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.E-4 (Management Actions that Could Result in Significant Physical Effects to Natural Resources from Watershed Operations, Maintenance, and Construction Activities) attached as Exhibit 12. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>E.2 In implementing any Management Action that could result in significant physical effects on natural resources from an increase in public access and use, as shown in Table III.E-5, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-5, attached as Exhibit 13).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.E-5 (Management Actions that Could Result in Significant Physical Effects to Natural Resources from an Increase in Public Access and Use) attached as Exhibit 13. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>

<sup>†</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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**ALAMEDA WATERSHED MANAGEMENT PLAN FEIR  
MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>E.3. In implementing any Management Action that could result in significant physical effects on natural resources from an increase in invasive plant species, as shown in Table III.E-6, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-6, attached as Exhibit 14).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.E-6 (Management Actions that Could Result in Significant Physical Effects from an Increase in Invasive Plant Species) attached as Exhibit 14. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>E.4. In implementing any Management Action that could result in significant physical effects on natural resources from implementation of the Grazing Resources Management Element, as shown in Table III.E-7, ensure that all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.E-7, attached as Exhibit 15).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.E-7 (Management Actions that Could Result in Significant Physical Effects to Natural Resources from Implementation of the Grazing resources Management Element) attached as Exhibit 15. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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**ALAMEDA WATERSHED MANAGEMENT PLAN FEIR  
MITIGATION MONITORING AND REPORTING PROGRAM**

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>E-5 In implementing any Management Action that could result in significant physical effects on natural resources from mining operations, as shown in Table III.E-8, ensure all applicable Management Actions are implemented that are necessary to reduce the impact (see Table III.E-8 attached as Exhibit 16). However, additional mitigation would be necessary to avoid a potentially significant effect (see E-5.a through E-5.d below)</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.E-8 (Management Actions that Could Result in Significant Physical Effects to Natural Resources from Implementation of the Sunol Valley Resources Management Element) attached as Exhibit 16. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>E-5.a In new leases entitling mining, require mining and reclamation operations to follow U.S. Fish and Wildlife Service protocol for the Alameda whipsnake critical habitat designation. Protocols for the protection of the Alameda whipsnake have not yet been finalized. However, at a minimum, pre-construction surveys will be required, and will involve walking parallel transects 20 to 50 feet apart across the entire site. If found, snakes would be released into</p>	Mining Operators	<ol style="list-style-type: none"> <li>1) Prior to the approval of new mining leases, SFPUC shall consult with the USFWS re the latest protocol for the Alameda whipsnake critical habitat designation as described in Mitigation Measure E-5.a.</li> <li>2) New leases entitling mining approved by the SFPUC shall include a requirement for the implementation of the protocol described in Mitigation Measure E.5.a.</li> </ol>	<ol style="list-style-type: none"> <li>1) SFPUC</li> <li>2) Alameda County Planning Dept.</li> <li>3) SF City Planning (MEA)</li> <li>4) USFWS</li> </ol>	<p>SFPUC and Alameda County Planning Department to monitor implementation of protocol for the Alameda whipsnake critical habitat designation as described in Mitigation Measure E-5.a during all phases of mining and reclamation (including preconstruction) in consultation with SF City Planning (MEA) and USFWS.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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<p>appropriate nearby habitat. The area of disturbance in any mining operation within designated critical habitat will be enclosed in snake-proof fencing.</p>		<ol style="list-style-type: none"> <li>1) Surface Mining Permit issued by Alameda County shall include a requirement for the implementation of the protocol described in Mitigation Measure E.5.a.</li> <li>2) Protocol implementation to take place during appropriate phases of mining operations, including pre-construction.</li> </ol>		
<p>E.5.b For proposed mining and reclamation operations north and south of I-680, require operators to have surveys conducted by a qualified biologist within storage pit ponds and other basins that store water at proposed mining and reclamation areas on an annual basis. Surveys would be completed for all life cycle stages of the California red-legged frog (e.g. egg masses, tadpole, juveniles, adults) and California tiger salamander. If no California red-legged frogs or tadpoles or California tiger salamanders are found within specific bodies of water undergoing mining or reclamation, mining and</p>	<p>Mining Operators</p>	<ol style="list-style-type: none"> <li>1) New leases entitling mining North and South of I-680 approved by the SFPUC shall include a requirement for surveys as described in Mitigation Measure E.5.b.</li> <li>2) Surface Mining Permits issued by Alameda County shall include a requirement for the implementation of Mitigation Measure E.5.b.</li> <li>3) Surveys to be conducted annually as described in Mitigation Measure E.5.b.</li> </ol>	<ol style="list-style-type: none"> <li>1) SFPUC</li> <li>2) Alameda County Planning Dept.</li> <li>3) SF City Planning (MEA)</li> <li>4) USFWS</li> </ol>	<p>SFPUC and Alameda County Planning Department to review annual surveys as described in Mitigation Measure E-5.b in consultation with SF City Planning (MEA) and USFWS.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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<b>MITIGATION MEASURE</b>	<b>Responsibility for Implementation</b>	<b>Mitigation Schedule</b>	<b>Monitoring Responsibility</b>	<b>Monitoring Actions/Schedule</b>
<p>reclamation shall cease in the specific pit or pond or other basins where the frogs and salamanders have been found. The frogs or salamanders would immediately be moved passively, or captured and moved, to suitable upstream sites by a biologist with the appropriate permits. Mining and reclamation may continue upon completion of the work by the biologist.</p>			1)	
<p>E.5.c Require mining operators north and south of I-680 to have the area surrounding storage pit ponds and other basins that store water routinely maintained clear of vegetation.</p>	Mining Operators	Removal of vegetation as needed to keep area surrounding ponds and basins clear as described in Mitigation Measure E.5.c.	SFPUC Watershed Manager	Ongoing inspection by SFPUC staff.
<p>E.5.d Require mining operators to implement mitigation measure D-3, a-d of the Mission Valley Rock Company Surface Mining Permit and Reclamation Plan SMP 32, Final Environmental Impact report, which avoids or minimizes impacts to wildlife. Mitigation measures b and c</p>	Mining Operators	1) Prior to the approval of a lease for mining on the site north of I-680, the SFPUC shall review and approve revised landscaping and buffering plans pursuant to Mitigation Measure E.5.d(a) and Mitigation Measure D-3, a-d of SMP-32. The implementation of the approved landscaping and	1) SFPUC and 2) Alameda County Planning Dept., in consultation with SF City Planning Dept. (MEA) and CDFG.	1) SFPUC and Alameda County Planning Dept., in consultation with SF City Planning Dept. (MEA) to review landscaping and buffering improvements during implementation phase.

<sup>†</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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<p>exception of the vineyard north of I-680. Off site habitat would be identified in coordination with the California Department of Fish and Game (CDFG) and the SFPUC</p> <p>c) Preconstruction surveys for burrowing owls should be conducted within each module prior to each state of topsoil disturbance and overburden removal to confirm or deny the presence of the species. If present, the species may be moved through passive relocation per approved CDFG procedures. This would include creating an artificial burrow complex and</p>				<p>Necessary, on-site habitat improvements must be completed and/or additional off-site habitat must be identified, set aside, and possibly enhanced in a manner acceptable to the SFPUC (in consultation with CDFG) prior to commencement of mining operations. Mining Operators to conduct preconstruction surveys for burrowing owls within each module and submit survey documentation to SFPUC and Alameda County Planning Department prior to commencement of topsoil disturbance and overburden removal. Surveys must be deemed accurate and complete by SFPUC and Alameda County Planning Dept. in consultation with SF City Planning (MEA). If</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<b>4. Air Quality<sup>1</sup></b>				necessary, passive relocation of the species must be completed in a manner acceptable to the SFPUC (in consultation with CDFG) prior to commencement of topsoil disturbance and overburden removal.
F.1 In implementing any Management Action that could result in significant physical effects on air quality from an increase in construction activities, as shown in Table III.F-3, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.F-3, attached as Exhibit 17).	SFPUC	See page 1 (Overview) for further information on the mitigation schedule and Table III.F-3 (Management Actions that Could Result in Significant Physical Effects on Air Quality Through Increase in Construction-Related Air Pollutant Emissions) attached as Exhibit 17. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.	SFPUC in consultation with SF City Planning (MEA)	See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.
<b>5. Fire Management<sup>1</sup></b>				

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>G.1 In implementing any Management Action that could result in significant physical effects with respect to fire hazard from reduction of existing fuel breaks, as shown in Table III.G-1, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-1, attached as Exhibit 18).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.G-1 (Management Actions that Could Result in Significant Physical Effects from Reduction of Existing Fuel Breaks) attached as Exhibit 18. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>G.2 In implementing any Management Action that could result in significant physical effects on fire management from increased public access and use, as shown in Table III.G-2, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-2, attached as Exhibit 19).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.G-2 (Management Actions that Could Result in Significant Physical Effects to Fire Management from Increased Public Access and Use) attached as Exhibit 19. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>G.3 In implementing any Management Action that could result in significant physical effects from use of prescribed burns, as shown in Table III.G-3, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.G-3, attached as Exhibit 20).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.G-3 (Management Actions that Could Result in Significant Physical Effects from Use of Prescribed Burns) attached as Exhibit 20. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p><b>6. Cultural Resources<sup>1</sup></b></p>				
<p>H.1 In implementing any Management Action that could result in significant physical effects on cultural resources from increased public access and use, as shown in Table III.H-2, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.H-2, attached as Exhibit 21).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.H-2 (Management Actions that Could Result in Significant Physical Effects on Cultural Resources from Increased Public Access and Use) attached as Exhibit 21. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>H.2 In implementing any Management Action that could result in significant physical effects on cultural resources from operations, maintenance, and construction activities, as shown in Table III.H-3, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.H-3, attached as Exhibit 22).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.H-3 (Management Actions that Could Result in Significant Physical Effects on Cultural Resources from Operations, Maintenance, and Construction Activities) attached as Exhibit 22. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>H.2.a Ensure that any alteration of identified historic resources takes place in accordance with the Secretary of Interior’s Standards for Treatment of Historic Properties.</p>	SFPUC	<p>Prior to altering an identified historic resource, consult with an architectural historian and prepare an assessment, including information related to the historical significance, physical condition, proposed use and intended interpretation of the historic resource. Working with an architectural historian, prepare a plan describing the treatment approach (preservation, rehabilitation, restoration or reconstruction) in accordance with the Secretary of the Interior’s Standards for Treatment of Historic Properties.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>During construction, retain the services of an architectural historian to monitor construction activity and to ensure compliance with the Secretary of the Interior’s Standards for Treatment of Historic Properties.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
H.2.b Prohibit the demolition or removal of historic structures.	SFPUC	In order to prohibit the demolition or removal of historic structures, implement Cultural Resources Management Actions (Alameda Watershed Management Plan, Section 5.13) to assess historic resources prior to new activities, protect existing cultural resources, and monitor cultural resources for evidence of disturbance, damage or vandalism. In addition, an alternative site should be identified in cases where proposed actions would result in the demolition or removal of historic structures.	SFPUC in consultation with SF City Planning (MEA)	As part of project review and planning process, SFPUC to ascertain the presence or absence of historic structures and potential impacts, if any, to these resources. In cases where historic structures are present, SFPUC to provide documentation to SF City Planning (MEA) demonstrating that the proposed project or activity would not result in the demolition or removal of historic structures.
<b>7. Aesthetics<sup>1</sup></b>				
I.1 In implementing any Management Action that could result in significant physical effects on aesthetic quality through installation of new facilities, as shown in Table III.I-1, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.I-1, attached as Exhibit 23).	SFPUC	See page 1 (Overview) for further information on the mitigation schedule and Table III.I-1 (Management Actions that Could Result in Significant Physical Effects to Aesthetic Quality through Installation of New facilities) attached as Exhibit 23. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.	SFPUC in consultation with SF City Planning (MEA)	See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>I.2 In implementing any Management Action that could result in significant physical effects on aesthetic quality through vegetation clearing activities, as shown in Table III.I-2, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.I-2, attached as Exhibit 24).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.I-2 (Management Actions that Could Result in Significant Physical Effects to Aesthetic Quality through Vegetation Clearing Activities) attached as Exhibit 24. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>I.3 In implementing any Management Action that could result in significant physical effects on aesthetic quality through increased public access and use, as shown in Table III.I-3, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.I-3, attached as Exhibit 25).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.I-3 (Management Actions that Could Result in Significant Physical Effects to Aesthetic Quality through Increased Public Access and Use) attached as Exhibit 25. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p><b>8. Transportation and Access<sup>1</sup></b></p>				

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>J.1 In implementing any Management Action that could result in significant physical effects to traffic and access through development of Sunol Valley recreational facilities, as shown in Table III.J-1, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.J-1, attached as Exhibit 25A).</p>	SFPUC	<p>See page 1 (Overview) for further information on the mitigation schedule and Table III.J-1 (Management Actions that Could Result in Significant Physical Effects to Traffic and Access through Development of Sunol Valley Recreational Facilities) attached as Exhibit 25A. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>	<p>SFPUC in consultation with SF City Planning (MEA)</p>	<p>See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.</p>
<p>J.2 As part of the design of new public facilities, include a parking plan developed in coordination with Alameda County to provide sufficient parking spaces to avoid unacceptable vehicle/pedestrian hazard. In addition, the SFPUC will monitor the area surrounding new public facilities and report illegal parking to the Alameda County Sheriff's Department for enforcement.</p>	<p>1) SFPUC 2) Alameda County</p>	<p>Consult with Alameda County during planning process for proposed public facilities.</p> <p><b>Note:</b> Per CEQA Guideline 15097(g), when a project is of areawide importance, any transportation information generated by a required monitoring or reporting program shall be submitted to the transportation planning agency in the region where the project is located.</p>	<p>1) SFPUC 2) Alameda County</p>	<p>SFPUC to obtain written approval from Alameda County on proposed parking plan for new public facilities.</p>

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p><b>9. Utilities and Public Services<sup>1</sup></b></p> <p>No potentially significant or significant impacts were identified in the FEIR, and no mitigation is required.</p>				
<p><b>10. Noise<sup>1</sup></b></p> <p>L.1 In implementing any Management Action that could result in significant physical effects on noise levels through construction activities, as shown in Table III.L-1, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.L-1, attached as Exhibit 25B).</p>	SFPUC	See page 1 (Overview) for further information on the mitigation schedule and Table III.L-1 (Management Actions that Could Result in Significant Physical Effects on Noise Levels Through Construction Activities) attached as Exhibit 25B. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.	SFPUC in consultation with SF City Planning (MEA)	See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.
<p>L.2 Limit construction activities near sensitive receptors to the hours and days specified by the <i>Alameda County General Plan Noise Element</i> (generally between 9 a.m. and 6 p.m., Monday-Friday).</p>	Construction Contractor or SFPUC Crews	<ol style="list-style-type: none"> <li>1) In the case of private contractors, include limits on hours of construction near sensitive receptors in specifications.</li> <li>2) In the case of SFPUC crews, include limits on hours of construction near sensitive receptors in work order.</li> </ol>	SFPUC	During construction SFPUC staff to monitor construction activities to ensure compliance.

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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<b>MITIGATION MEASURE</b>	<b>Responsibility for Implementation</b>	<b>Mitigation Schedule</b>	<b>Monitoring Responsibility</b>	<b>Monitoring Actions/Schedule</b>
L.3 Require in construction specifications that the contractor select staging areas as far as feasibly possible from existing sensitive land uses. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure L.1, above.	Construction Contractor or SFPUC Crews	In the construction plans and specifications or departmental work order, identify existing sensitive land uses and stipulate that staging areas must be located as far as feasibly possible from these sites.	SFPUC	During the preconstruction meeting, work with contractor or SFPUC crew supervisor to locate staging areas in conformance with Mitigation Measure L.2. During construction SFPUC staff to monitor construction activities to ensure compliance.
L.4 Require in construction specifications that the contractor maintain all construction equipment with manufacturers' specified noise-muffling devices.	Construction Contractor or SFPUC Crews	1) In the case of private contractors, include equipment noise muffling requirement in specifications. 2) In the case of SFPUC crews, include equipment noise muffling requirement in work order.	SFPUC	During the preconstruction meeting, inspect equipment of contractor or SFPUC crew supervisor to verify compliance with equipment noise muffling requirement. During construction SFPUC staff to monitor construction activities to ensure compliance.
L.5 Require in construction specifications that the contractor maintain all stationary noise-generating construction equipment as far away as feasibly possible from sensitive receptors or in an orientation that reduces or Minimizes noise impacts (i.e., behind existing barriers or storage piles, etc.).	Construction Contractor or SFPUC Crews	In the construction plans and specifications or departmental work order, identify existing sensitive receptors and stipulate that all stationary noise-generating construction equipment must be located as far as feasibly possible from these sites or oriented to reduce or minimize noise.	SFPUC	During preconstruction meeting, work with contractor or SFPUC crew supervisor to locate all stationary noise-generating construction equipment in conformance with Mitigation Measure L.4. During construction SFPUC staff to monitor construction activities to ensure compliance.

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<b>11. Hazardous Materials and Hazardous Waste<sup>1</sup></b>				
M.1 In implementing any Management Action that could result in significant physical effects from construction-related exposure to hazardous materials and hazardous waste, as shown in Table III.M-1, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.M-1, attached as Exhibit 26).	SFPUC	See page 1 (Overview) for further information on the mitigation schedule and Table III.M-1 (Management Actions that Could Result in Significant Physical Effects Through Construction-Related Exposure of Hazardous Materials) attached as Exhibit 26. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.	SFPUC in consultation with SF City Planning (MEA)	See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.
M.2 In implementing any Management Action that could result in significant physical effects from operations-related exposure to hazardous materials and hazardous waste, as shown in Table III.M-2, ensure all applicable Management Actions are implemented that are necessary to reduce the impact to a less than significant level (see Table III.M-2, attached as Exhibit 27).	SFPUC	See page 1 (Overview) for further information on the mitigation schedule and Table III.M-2 (Management Actions that Could Result in Significant Physical Effects Through Operations-Related Exposure of Hazardous Materials) attached as Exhibit 27. See also the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.	SFPUC in consultation with SF City Planning (MEA)	See page 1 (Overview) for further information on the monitoring actions/schedule and the draft report entitled <i>Mitigation Measures Derived from Management Actions and Policies</i> on file with the SFPUC.

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>M.2.a Prior to any significant soil disturbance or excavation in areas with a history of uses that could have generated hazardous wastes, conduct an analysis of the soil for hazardous wastes. Where hazardous wastes are found in excess of state or federal standards, submit a site mitigation plan and worker safety plan to the Alameda County or Santa Clara County Department of Environmental Health for approval. Implement the approved site mitigation plan and worker safety plan prior to site grading or other soil disturbance. If toxics are found for which no standards are established, request a determination from the Alameda or Santa Clara County Department of Environmental Health or the state or federal agency with jurisdiction as to whether site mitigation is needed.</p>	SFPUC	<p>During preliminary project planning stages, conduct sites assessment to determine potential presence of hazardous wastes and follow with soil analysis if appropriate. During preconstruction phase, submit site mitigation plan and worker safety plan to County Environmental Health Departments if warranted. Implement approved site mitigation plan and worker safety plan prior to soil disturbance activities.</p>	<p>1) SFPUC 2) Alameda County Dept. of Env. Health, or 3) Santa Clara County Dept.of Env. Health</p>	<p>During construction, SFPUC staff to monitor construction activities to ensure compliance in consultation with County Environmental Health Department.</p>

**12. Energy<sup>1</sup>**

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
<p>No potentially significant or significant impacts were identified in the FEIR, and no mitigation is required.</p>				
<p><b>13. Growth Inducement<sup>1</sup></b></p>				
<p>No potentially significant or significant impacts were identified in the FEIR, and no mitigation is required.</p>				

<sup>1</sup> See the appropriate section of the setting and impacts analysis in Chapter III of the FEIR.

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## 7.4 Table III From the Alameda Watershed Management Plan Final EIR

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The following tables are from the impact section of the Final EIR for the Alameda Watershed Management Plan. These tables, identified as Exhibits 3 through 27, show the combination of management actions needed to reduce

potential physical effects of particular plan policies and management actions. The resulting level of significance of the potential impact is analyzed.



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III .ENVIRONMENTAL SETTING AND IMPACTS

C. GEOLOGY AND SOILS

**TABLE III.C-2  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO GEOLOGY AND SOILS  
THROUGH INCREASES IN SOIL EROSION**

**Management Actions that Could be Required to Reduce Potential Physical Effects**

**Policies or Management Actions that  
Would Result in Potential Physical Effects<sup>a</sup>**

**Policy or Action<sup>a,b</sup>**

**Level of Significance  
if Implemented**

Action pub3: Establish information kiosks at Watershed entryways.	Actions <b>veg4, veg7</b> , and des5.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action sun19: Establish a small commercial site.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action sun20: Establish an overnight nature study area.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Policy WA15.2: Consider new trails in zones of lesser vulnerability and risk.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions roa1, <b>roa2</b> , roa3, roa4, roa7, <b>roa12, veg4, veg7</b> , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Actions <b>veg4, veg7</b> , and des5.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less Than Significant

III .ENVIRONMENTAL SETTING AND IMPACTS  
 C. GEOLOGY AND SOILS

**TABLE III.C-2 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO GEOLOGY AND SOILS THROUGH INCREASES IN SOIL EROSION**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Level of Significance if Implemented
Action haz6: Install barriers or fences along identified high-risk spill potential areas.	Actions, <b>veg4</b> , <b>veg7</b> , and des5.	LTS
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, and detention basins.	Actions, <b>veg4</b> , <b>veg7</b> , and des5.	LTS
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Actions, <b>veg4</b> , <b>veg7</b> , and des5.	LTS
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection practices.	Actions, <b>veg4</b> , <b>veg7</b> , and des5.	LTS
Action aqu7: Rehabilitate stream segments.	Actions <b>fir14</b> and <b>veg5</b> .	LTS
Action fir7: Identify and construct necessary road improvements.	Actions, <b>veg4</b> , <b>veg7</b> , and des5.	LTS
Policy F11: Use prescribed fire to control fuels.	Actions <b>fir14</b> and <b>veg5</b> .	LTS
Action wil7: Create palatable re-sprouting through mechanical vegetation treatments or prescribed fire.	Actions <b>veg7</b> , <b>fir14</b> and <b>veg5</b> .	LTS
Over grazing by livestock.	Actions <b>gra1</b> , <b>gra2</b> , and gra6.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

C. GEOLOGY AND SOILS

**TABLE III.C-3  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO GEOLOGY AND SOILS  
DUE TO REDUCED SLOPE STABILITY**

Policies or Management Actions that Could Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u>	Level of Significance if Implemented
	Policy or Action <sup>a,b</sup>	
Action sun14: Develop a public recreation area around the Sunol Water Temple, including trail connections to Nilas Canyon and Pleasanton Ridge Regional Parks.	Actions <b>veg10</b> and roa12.	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions <b>veg10</b> and roa12.	LTS
Policy WA15.2: Consider new trails in zones of lesser vulnerability and risk.	Actions <b>veg10</b> and roa12.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions <b>veg10</b> and roa12.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
PS = Potentially Significant  
LTS = Less Than Significant

**III. ENVIRONMENTAL SETTING****D. HYDROLOGY AND W.**

**TABLE III.D-2  
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS DUE TO INCREASED PUBLIC ACCESS AND USE**

**Impact-Inducing Policies or Management Actions:<sup>a</sup>**

- Action pub3: Establish information kiosks at Watershed entryways.
- Action pub4: Establish a Watershed Visitor Education Center.
- Action sun14: Develop a public recreation area around the Sunol Water Temple.
- Action sun19: Establish a small commercial site.
- Action sun20: Establish an overnight nature study area.
- Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.
- Policy WA1: Prohibit fishing, with the exception of Alameda Creek within the Sunol Regional Wilderness.
- Policy WA40: Allow fishing in one of the Sunol Valley reservoirs.
- Policy WA15.2: Consider the addition of new trails in zones of lesser vulnerability and risk.
- Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.
- Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.
- Action des8: Implement universal access improvements at SFPUC facilities and trails.
- Action sun17: Provide universal access at Sunol Valley recreation facilities.

**Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant:<sup>a</sup>**

- Policies WQ10, WQ11, WQ15, WQ27, WQ28, and WQ29: Promote minimizing construction of new trails, restricting trail design and locations, minimizing or prohibiting any activities that cause sedimentation, and restricting public access and activities.
- Policy AR10: Prohibit certain activities within high water-quality vulnerability zones.
- Policies F2, F3, F5, F6, F7, and F8: Prohibit activities likely to cause a fire, require fire hazard reduction activities, call for providing fire suppression needs, and manage public access.
- Policies WA1, WA2, WA4, WA13, WA16, WA17, WA18, and WA39: Prohibit activities that are detrimental to Watershed resources, restrict new trails and access, restrict development, and call for managing public use through education and permit process. Policy WA39 prohibits body contact with water in the Sunol Valley reservoirs.
- Policies PA1, PA2, PA7, and PA8: Call for educating the public on Watershed resource protection and promoting collaboration in research and monitoring with agencies and public groups.
- Actions was1 and was2 require management of public sanitary facilities.
- Actions fir1 through fir14 are derived from the Fire Management Element and present an integrated approach to fire management.
- Actions saf2 through saf17 include measures to protect human health and safety as well as to protect water quality through regular maintenance of public facilities.
- Action veg1 includes human activities monitoring in development of a Vegetation Management Plan.

<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

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**III. ENVIRONMENTAL SETTING AND IMPACTS****D. HYDROLOGY AND WATER QUALITY**

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**TABLE III.D-2 (Continued)**  
**SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS DUE TO INCREASED PUBLIC ACCESS AND USE**

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**Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant (cont.):<sup>a</sup>**

- Action aqu4 prohibits land use activities in shoreline segments that cause excessive sedimentation to reservoirs.
- Actions lea3, lea4, lea5, and lea8 require that all land use leases include water quality protection measures and a monitoring plan.
- Actions pub1 through pub11 call for development of public education and awareness of Watershed management and water quality protection measures.
- Action sta6 calls for specific water quality training for staff.
- Action fic2 authorizes or prohibits specific lease and permit activities based partially on impacts to water quality.
- Action inf3 requires recording and updating water quality data.

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<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

## III. ENVIRONMENTAL SETTING AND IMPACTS

## D. HYDROLOGY AND WATER QUALITY

**TABLE III.D-3  
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS  
DUE TO DEVELOPMENT OF NEW FACILITIES**

**Impact-Inducing Policies or Management Actions:<sup>a</sup>**

- Action haz6: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.
- Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, and detention basins.
- Action aqu12: Install long-term sediment retention basins or other permanent measures.
- Action aqu5: Rehabilitate shoreline areas using structural shoreline protection measures.
- Action aqu7: Rehabilitate stream segments.
- Action was1: Repair/replace vault, chemical, and composting toilet as necessary.
- Action roa2: Relocate existing necessary high use roads/road segments in proximity to streams.
- Action roa3: Modify the grading and drainage of existing necessary high use roads/road segments.
- Action roa4: Close and retire roads that are not needed and eliminate or minimize problem erosion points by installing culverts and waterbars, or otherwise stabilizing the roadway.
- Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.
- Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.
- Action roa8: Restrict access on low use roads by gates or barriers.
- Action fir2: Install a total of nine hydrants into water sources.
- Action fir3: Install and maintain a total of four helispots on SFPUC property.
- Action fir4: Install three additional helispots off SFPUC lands.
- Action fir5: Install two additional hydrants on adjacent lands.
- Action fir6: Install an additional water tank.
- Action fir7: Identify/construct road improvements, including turnouts, turnarounds, and safety zones.
- Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.
- Action will13: Design and install wildlife passage structures that minimize wildlife losses.
- Action pub3: Establish “gateway” information kiosks.
- Action pub4: Establish a Visitor Education Center.
- Action sun17: Provide universal access at Sunol Valley recreation facilities.
- Action des8: Implement universal access improvements at SFPUC facilities and trails.

<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

III. ENVIRONMENTAL SETTING AND IMPACTS

D. HYDROLOGY AND WATER QUALITY

**TABLE III.D-3 (Continued)  
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS  
DUE TO DEVELOPMENT OF NEW FACILITIES**

**Impact-Inducing Policies or Management Actions (cont.):<sup>a</sup>**

- Actions sun1, sun2a, sun2b: These Sunol Valley actions would allow for mining of gravel quarries such that following completion of mining, the pits can be converted into water storage reservoirs.
- Action sun4: Create sideslopes on the mining pits such that there is a gradual transition to water.
- Action sun5: Reclaim mining pits with sideslopes appropriate to their proposed activity.
- Action sun10: Retain the existing Sunol maintenance facility with improvements, including equipment storage shelter, warehouse and storage yard, parking, etc.
- Action sun11: Backfill and landscape a ¼-mile buffer zone at the mining module closest to the water temple, between that module and the temple.
- Action sun13: Restore the historic entry to the Sunol Water Temple.
- Action sun14: Develop a public recreation area around the Sunol Water Temple.
- Action sun19: Establish a small commercial site.
- Action sun20: Establish an overnight nature study area.
- Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.
- Action gra2: Implement structural protection measures, including fencing and other improvements.
- Action gra6: Implement improvements for the San Antonio Watershed Protection Area.
- Action gra7: Implement improvements for the Calaveras Watershed Protection Area.
- Action gra8: Implement improvements for the lower Alameda Creek Watershed Protection Area.
- Policy WA37: Expedite the creation of water storage facilities in the Sunol Valley.
- Policies WS2, WS7: Evaluate the development of water supply reservoirs and enhancement of the water yield of the Watershed.
- Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.
- Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.
- Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.

**Policies or Management Actions the Could be Required to Reduce Potential Impacts to Less Than Significant:<sup>a</sup>**

- Policy WQ9: Require maintaining water quality water storage reservoirs for potential water supply uses.
- Policies WQ10, WQ11, WQ12, WQ13, WQ15, WQ17, WQ19, WQ21, WQ22, and WQ24: Set restrictions on new roads, restrict land use activities that cause sedimentation, restrict creation of impervious surfaces, restrict construction of new on-site waste treatment systems, and coordinate with other agencies regarding new construction.

<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

**III. ENVIRONMENTAL SETTING AND IMPACTS****D. HYDROLOGY AND WATER QUALITY**

**TABLE III.D-3 (Continued)**  
**SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS**  
**DUE TO DEVELOPMENT OF NEW FACILITIES**

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**Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant (cont.):<sup>a</sup>**

- Policy AR10: Prohibit certain activities within high water-quality vulnerability zones.
  - Policies F3, F5, and F6: Require fire hazard reduction activities for new lessees and provide fire suppression equipment needs.
  - Policies WA7, WA19, WA20, WA22, WA23, WA24, WA25, WA28, and WA30: Limit construction of waste disposal systems, require a new projects review process, and set new facilities restrictions.
  - Action roa12: Specify requirements of new roads and trails developed in the Watershed.
  - Actions veg4 and veg7: Require an approved grading plan prior to any construction project and require that construction activities comply with erosion control best management practices.
  - Action aqu1: Require site-specific review to ensure that construction of new non-water-dependent facilities are not located within a high water quality vulnerability zone.
  - Actions env1 through env6: Require that any proposal for new facilities or projects complies with the California Environmental Quality Act.
  - Actions lea3, lea4, and lea5: Require that all new land use leases include water quality protection measures and a monitoring plan.
  - Actions des1 and des2: Require a review process for all proposed plans and projects.
  - Action sta6: Provide specific water quality training for staff.
  - Action fic2: Authorize/prohibit specific lease/permit activities based partially on water quality impacts.
  - Action inf3: Record and update water quality data.
  - Actions sun3, sun6, sun8, and sun9: Require design and operational requirements for the storage reservoirs that protect water quality and water quality monitoring in the water storage reservoirs to maintain high water quality.
- 

<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

**III. ENVIRONMENTAL SETTING AND IMPACTS****D. HYDROLOGY AND WATER QUALITY**

**TABLE III.D-4  
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS  
DUE TO WATERSHED OPERATIONS AND MAINTENANCE ACTIVITIES**

**Impact-Inducing Policies or Management Actions:<sup>a</sup>**

- Policy F11: Allow for use of prescribed burns for fuel management.
- Action wil7: Create palatable re-sprouting through mechanical vegetation treatments or prescribed fire.
- Action sun10: Retain the Sunol maintenance facility for uses including the handling and storage of hazardous materials including fuels.

**Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant:<sup>a</sup>**

- Policies WQ1 through WQ8, WQ14, WQ15, WQ16, WQ18, WQ20, WQ23, WQ25, WQ26, WQ30, and WQ31: Manage use of pesticides, metals, hazardous materials, and other chemicals; minimize nutrient loading; prevent introduction of asbestos into the water supply; minimize introduction of pathogens to the water supply; optimize use of the existing road system; control sedimentation and erosion; protect wetland and stream channels; coordinate with agencies for protecting water quality; and require ongoing monitoring of activities and water quality.
- Policies WS5, WS6, and WS7: Prohibit water yield activities which could affect water quality.
- Policies V1 and V2: Minimize potential water quality impacts associated with Watershed operations and maintenance activities by managing pest management and chemical use.
- Policies AR5 and AR10: Minimize the introduction of chemicals to reservoirs and streams and prohibiting certain activities within high water-quality vulnerability zones.
- Policies F5, F6, F12, F13, and F14: Provide fire suppression needs and regulate fuel management activities.
- Policies S8 and S9: Require utility pipelines to comply with hazardous materials regulations and to adhere to emergency response procedures.
- Policies WA3, WA26, WA29, WA33 and WA34: Prohibit construction of utility pipelines, require all operation and maintenance activities to incorporate best management practices; use the GIS as part of Watershed planning; and manage water system maintenance activities for Watershed protection. Policy WA33: Requires LRMS staff to administer, manage, direct and supervise all Watershed operations and maintenance activities.
- Action sto1: Manage stormwater drainage facilities and establish preventive maintenance programs.
- Actions haz1 through haz12: Manage use, storage, and handling of hazardous materials associated with Watershed operations and maintenance.
- Actions was3 and was4: Allow for water quality monitoring for wildlife excrement and consultation with adjacent counties regarding on-site waste disposal.
- Actions roa1 through roa11: Assess and manage existing roads to minimize effects on water quality.

<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

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**III. ENVIRONMENTAL SETTING AND IMPACTS**
**D. HYDROLOGY AND WATER QUALITY**


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**TABLE III.D-4 (Continued)**  
**SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS**  
**DUE TO WATERSHED OPERATIONS AND MAINTENANCE ACTIVITIES**

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**Policies or Management Actions the Could be Required to Reduce Potential Impacts to Less Than Significant (cont.):<sup>a</sup>**

- Actions fir1 through fir14 (derived from the *Alameda Watershed Fire Management Element*): Conduct an integrated approach to fire management.
  - Action saf12: Develop, publish, and periodically update a Watershed manual that addresses operations and maintenance procedures, emergency response procedures, and the safety and security program.
  - Action veg1: Require preparation and implementation of a Vegetation Management Plan. Action veg7: Require that operations and maintenance activities comply with erosion control best management practices. Actions veg8 and veg9: Identify areas subject to slope instability and soil erosion and require implementing erosion control. Action veg10: Establish long-term erosion and sediment control monitoring. Action veg11: Develop and implement an Integrated Pest Management program for the Watershed. Action veg13: Minimize the disturbance of serpentine soils to prevent erosion of asbestos fibers to the water supply.
  - Actions aqu2, aqu3, aqu4, aqu5, aqu6, aqu7, and aqu8: Provide strategies for protection of reservoir shorelines and streambanks. Actions aqu10, aqu11, aqu12, aqu13, and aqu14: Specify management of sedimentation basins or sediment detention basins to optimize their use in maintaining water quality.
  - Action fis6: Adopt nontoxic management practices for protection of aquatic resources.
  - Action sta6: Provide specific water quality training for staff.
  - Action fic2: Authorize or prohibit specific lease or permit activities based partially on impacts to water quality.
  - Action inf3: Record and update water quality data.
- 

<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

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**III. ENVIRONMENTAL SETTING AND IMPACTS****D. HYDROLOGY AND WATER QUALITY**

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**TABLE III.D-5  
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS  
DUE TO CHANGES TO GRAVEL MINING OPERATIONS**

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**Impact-Inducing Policies or Management Actions:<sup>a</sup>**

- Policy WA37: Allows the continuation of mining activities in the Sunol Valley.
- Actions sun1, 2a, and 2b: Allow continuation of mining in existing permitted areas according to SMP-32 as well as consideration of amending the permits to expand mining south of I-680 either in depth or in area.

**Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant:<sup>a</sup>**

- Policy WA5: Prohibit instream mining and/or development along reservoir shorelines and tributary streams which are located within primary Watershed lands.
- Policy WA32: Require a reclamation plan for all existing and new mining operations.
- Policy WA24: Require a grading plan to minimize off-site soil loss.
- Policy W6: Maintain the integrity of the Watershed creeks to retain their value as riparian ecosystems and wildlife corridor.
- Policy F3: Require all lessees to conduct fire hazard reduction activities.
- Policy AR10: Prohibit or limit certain activities within high water-quality vulnerability zones.
- Actions lea3, lea4, and lea5: Ensure that land use leases would include water quality protection measures and monitoring plan.
- Actions lea6 and lea8: Require review of the reclamation plan for mineral, sand, and gravel leases that would include drainage/erosion control features to be employed and requires assignment of a lease coordinator.
- Action sta6: Provide specific water quality training for staff.
- Action fic2: Authorize or prohibit specific lease or permit activities based partially on impacts to water quality.
- Action inf3: Record and update water quality data.

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<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

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**III. ENVIRONMENTAL SETTING AND IMPACTS****D. HYDROLOGY AND WATER QUALITY**

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**TABLE III.D-6  
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS  
DUE TO NURSERY OPERATIONS**

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**Impact-Inducing Policies or Management Actions:<sup>a</sup>**

- Improper management of nursery or agricultural operations or the Management Plan.

**Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant:<sup>a</sup>**

- Policy WQ3: Minimize nutrient loading to the water supply.
  - Policy WA25: Require all lessees and permittees to comply with the City's Pesticide Management Plan Ordinance and the SFPUC Integrated Pest Management Plan, and to submit a Chemical Application Management Program.
  - Actions lea3, lea4, and lea5: Ensure that land use leases include water quality protection measures and monitoring plan.
  - Action lea8: Require assignment of a lease coordinator.
  - Action sta6: Provide specific water quality training for staff.
  - Action fic2: Authorize or prohibit specific lease or permit activities based partially on impacts to water quality.
  - Action inf3: Record and update water quality data.
- 

<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

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**III. ENVIRONMENTAL SETTING AND IMPACTS****D. HYDROLOGY AND WATER QUALITY**

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**TABLE III.D-7  
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS  
DUE TO EXPANSION OF GOLF COURSE USES**

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**Impact-Inducing Policies or Management Actions:<sup>a</sup>**

- Policy WA18.1: Consider expansion of existing golf courses in zones of low vulnerability/sensitivity.

**Mitigating Policies or Management Actions:<sup>a</sup>**

- Policies WQ3, WQ15, WQ17, and WQ19: Minimize nutrient loading to the water supply, minimize land uses and activities that can cause erosion and runoff, minimize the creation of impervious surfaces, and minimize the construction of new on-site waste treatment systems that could be associated with expansion of the existing golf course.
- Policy AR10: Minimize potential water quality impacts associated with expansion of golf course use by prohibiting certain activities within high water-quality vulnerability zones.
- Policies F3, F5, and F6: Minimize potential water quality impacts associated with expansion of golf course use by requiring fire hazard reduction activities for new lessees and providing fire suppression equipment needs.
- Policies WA24 and WA25: Require a grading plan and require all lessees and permittees to comply with the Integrated Pesticide Management Plan and Chemical Application Management Program.
- Actions env1 through env5: Ensure that any proposal for expansion of the existing golf course must comply with the California Environmental Quality Act.
- Actions lea3, lea4, and lea5: Ensure that land use leases would include water quality protection measures and monitoring plan.
- Actions des1 and des2: Require a review process for all proposed plans and projects.
- Action fic2: Authorize or prohibit specific lease or permit activities, based partially on impacts to water quality.
- Action inf3: Record and update water quality data.

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<sup>a</sup> See Table II-1 of the Final Environmental Impact Report (FEIR) for a description of each action.

III. ENVIRONMENTAL SETTING AND IMPACTS

D. HYDROLOGY AND WATER QUALITY

**TABLE III.D-8  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS  
DUE TO BUILD-UP OF SEDIMENTS**

Policies or Management Actions that Could Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u>	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Tables III.D-2 through III.D-7 list the actions that could result in erosion and sedimentation, thereby resulting in potential impacts due to build-up of sediments.	Policies WQ14, <b>WQ15</b> , WQ16, <b>WQ17</b> , <b>WS1</b> , and <b>WA24</b> and Actions roa2, <b>roa3</b> , roa4, <b>roa7</b> , <b>roa12</b> , <b>veg4</b> , <b>veg7</b> , <b>aqu6</b> , <b>aqu7</b> , <b>aqu10</b> , aqu11, and aqu12 and the policies and actions associated with the Fire Management Element.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
 E. NATURAL RESOURCES

**TABLE III.E-4  
 MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO NATURAL RESOURCES  
 FROM WATERSHED OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action veg6: Identify and remove, using IPM, invasive exotic plant species.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action veg12: Coordinate with PG&E in clearing vegetation.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action wil5: Relocate or eliminate unnecessary infrastructure and facilities.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action wil7: Create palatable re-sprouting through mechanical treatments or prescribed fire.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg5.1</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, and detention basins.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection practices.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action aqu7: Rehabilitate stream segments.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action haz6: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action was1: Repair/replace vault, chemical, and composting toilet as necessary.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action roa2: Relocate existing necessary high use roads/road segments in proximity to streams.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

E. NATURAL RESOURCES

**TABLE III.E-4 (Continued)  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO NATURAL RESOURCES  
FROM WATERSHED OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action roa3: Modify the grading and drainage of existing necessary high use roads/road segments.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action roa4: Close and retire roads that are not needed and eliminate or minimize problem erosion points by installing culverts and waterbars, or otherwise stabilizing the roadway.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action roa8: Restrict access on low use roads by gates or barriers.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action fir2: Install a total of nine hydrants into water sources.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action fir3: Install and maintain a total of four helispots on SFPUC property.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action fir4: Install three additional helispots off SFPUC lands.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action fir5: Install two additional hydrants on adjacent lands.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action fir6: Install an additional water tank.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Actions <b>veg1</b> , veg2, <b>veg3</b> , <b>veg5.1</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

E. NATURAL RESOURCES

**TABLE III.E-4 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO NATURAL RESOURCES FROM WATERSHED OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action will13: Design and install wildlife passage structures that minimize wildlife losses.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action pub3: Establish "gateway" information kiosks.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action pub4: Establish a Visitor Education Center.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun4: Create sideslopes on the quarry pits such that there is a gradual transition to water.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun5: Reclaim quarries with sideslopes appropriate to their proposed activity.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun10: Retain the existing Sunol maintenance facility with improvements, including equipment storage shelter, warehouse and storage yard, parking, etc.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun11: Backfill and landscape a ¼-mile buffer zone at the mining module closest to the Sunol Water Temple, between that module and the water temple.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun13: Restore the historic entry to the Sunol Water Temple.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun19: Establish a small commercial site.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
 E. NATURAL RESOURCES

**TABLE III.E-4 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO NATURAL RESOURCES FROM WATERSHED OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action sun20: Establish an overnight nature study area.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action gra2: Implement structural protection measures, including fencing and other improvements.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action gra6: Implement improvements for the San Antonio Water Protection Area.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action gra7: Implement improvements for the Calaveras Watershed Protection Area.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Action gra8: Implement improvements for the Lower Alameda Creek Watershed Protection Area.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Actions <b>veg1</b> , <b>veg2</b> , <b>veg3</b> , <b>veg6.1</b> , and <b>wil1</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
 E. NATURAL RESOURCES

**TABLE III.E-5  
 MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS  
 NATURAL RESOURCES FROM AN INCREASE IN PUBLIC ACCESS AND USE**

**Management Actions that Could be Required to Reduce Potential Physical Effects**

**Policies or Management Actions that  
 Would Result in Potential Physical Effects<sup>a</sup>**

**Policy or Action<sup>a,b</sup>**

**Level of Significance  
 if Implemented**

Action pub3: Establish information kiosks at Watershed entryways.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	PS
Action pub4: Establish a Watershed Visitor Education Center.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	PS
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Action sun19: Establish a small commercial site.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Action sun20: Establish an overnight nature study area.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Policy WA15.2: Consider new trails in zones of low vulnerability and risk.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Actions <b>des5, wil10</b> . Also see Table III.I-3.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

E. NATURAL RESOURCES

**TABLE III.E-6  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS  
FROM AN INCREASE IN INVASIVE PLANT SPECIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Tables III.E-4 and III.E-5 list the actions that would generate construction activities or increased public use, thereby resulting in potential impacts from an increase in invasive plant species.	Actions <b>veg1</b> and <b>veg6</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
 E. NATURAL RESOURCES

**TABLE III.E-7  
 MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS  
 FROM IMPLEMENTATION OF THE GRAZING RESOURCES MANAGEMENT ELEMENT**

<b>Policies or Management Actions that Would Result in Potential Physical Effects<sup>a</sup></b>	<b><u>Management Actions that Could be Required to Reduce Potential Physical Effects</u></b> <b>Policy or Action<sup>a,b</sup></b>	<b>Level of Significance if Implemented</b>
Improper management of grazing under the Management Plan.	Actions <b>gra1</b> through <b>gra5</b> and gra6 through gra14.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
 E. NATURAL RESOURCES

**TABLE III.E-8  
 MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS  
 FROM IMPLEMENTATION OF THE SUNOL VALLEY RESOURCES MANAGEMENT ELEMENT**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u>	Level of Significance if Implemented
Action sun1: Mine the existing permitted areas in accordance with SMP-32, north of I-680.	Action <b>wil1</b> .	PS, see Section IV.E
Action sun2a: Amend the existing mining permits south of I-680 to achieve a maximum mining depth and footprint.	Action <b>wil1</b> .	PS, see Section IV.E
Action sun2b: Amend the existing mining permits south of I-680 to achieve a maximum mining depth.	Action <b>wil1</b> .	PS, see Section IV.E

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

F. AIR QUALITY

**TABLE III.F-3  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AIR QUALITY  
THROUGH INCREASE IN CONSTRUCTION – RELATED AIR POLLUTANT EMISSIONS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action haz6: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Action <b>des9</b> .	LTS
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, and detention basins.	Action <b>des9</b> .	LTS
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Action <b>des9</b> .	LTS
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection practices.	Action <b>des9</b> .	LTS
Action aqu7: Rehabilitate stream segments.	Action <b>des9</b> .	LTS
Action was1: Repair/replace vault, chemical, and composting toilet as necessary.	Action <b>des9</b> .	LTS
Action roa2: Relocate existing necessary high use roads/road segments in proximity to streams.	Actions roa12 and <b>des9</b> .	LTS
Action roa3: Modify the grading and drainage of existing necessary high use roads/road segments.	Actions roa12 and <b>des9</b> .	LTS
Action roa4: Close and retire roads that are not needed and eliminate or minimize problem erosion points by installing culverts and waterbars, or otherwise stabilizing the roadway.	Actions roa12 and <b>des9</b> .	LTS
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.	Actions roa12 and <b>des9</b> .	LTS
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions roa12 and <b>des9</b> .	LTS
Action roa8: Restrict access on low use roads by gates or barriers.	Actions roa12 and <b>des9</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
 F. AIR QUALITY

**TABLE III.F-3 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AIR QUALITY THROUGH INCREASE IN CONSTRUCTION – RELATED AIR POLLUTANT EMISSIONS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action fir2: Install a total of nine hydrants into water sources.	Action <b>des9</b> .	LTS
Action fir3: Install and maintain a total of four helispots on SFPUC property.	Action <b>des9</b> .	LTS
Action fir4: Install three additional helispots off SFPUC lands.	Action <b>des9</b> .	LTS
Action fir5: Install two additional hydrants on adjacent lands.	Action <b>des9</b> .	LTS
Action fir6: Install an additional water tank.	Action <b>des9</b> .	LTS
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Action <b>des9</b> .	LTS
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Action <b>des9</b> .	LTS
Action will13: Design and install wildlife passage structures that minimize wildlife losses.	Action <b>des9</b> .	LTS
Action pub3: Establish “gateway” information kiosks.	Action <b>des9</b> .	LTS
Action pub4: Establish a Visitor Education Center.	Action <b>des9</b> .	LTS
Action sun4: Create sideslopes on the quarry pits such that there is a gradual transition to water.	Action <b>des9</b> .	LTS
Action sun5: Reclaim quarries with sideslopes appropriate to their proposed activity.	Action <b>des9</b> .	LTS
Action sun10: Retain the existing Sunol maintenance facility with improvements, including equipment storage shelter, warehouse and storage yard, parking, etc.	Action <b>des9</b> .	LTS
Action sun11: Backfill and landscape a ¼-mile buffer zone at the mining module closest to the Sunol Water Temple, between that module and the temple.	Action <b>des9</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

F. AIR QUALITY

**TABLE III.F-3 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AIR QUALITY THROUGH INCREASE IN CONSTRUCTION – RELATED AIR POLLUTANT EMISSIONS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup> if Implemented	Level of Significance
Action sun13: Restore the historic entry to the Sunol Water Temple.	Action <b>des9</b> .	LTS
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Action <b>des9</b> .	LTS
Action sun19: Establish a small commercial site.	Action <b>des9</b> .	LTS
Action sun20: Establish an overnight nature study area.	Action <b>des9</b> .	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Action <b>des9</b> and roa12.	LTS
Action gra2: Implement structural protection measures, including fencing and other improvements.	Action <b>des9</b> .	LTS
Action gra6: Implement improvements for the San Antonio Water Protection Area.	Action <b>des9</b> .	LTS
Action gra7: Implement improvements for the Calaveras Watershed Protection Area.	Action <b>des9</b> .	LTS
Action gra8: Implement improvements for the Lower Alameda Creek Watershed Protection Area.	Action <b>des9</b> .	LTS
Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.	Action <b>des9</b> and roa12.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Action <b>des9</b> and roa12.	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Action <b>des9</b> .	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Action <b>des9</b> .	LTS
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Action <b>des9</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

F. FIRE MANAGEMENT

**TABLE III.G-1  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL  
FROM REDUCTION OF EXISTING FUEL BREAKS**

Policies or Management Actions that Could Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u> Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action roa4: Close and retire roads that are not needed.	Actions fir2, fir3, fir4, fir5, fir6, <b>fir7</b> , fir8, <b>fir12</b> , and <b>gra1</b> through <b>gra5</b> .	LTS
Action roa5: Reduce the need for multiple maintenance access roads.	Actions fir2, fir3, fir4, fir5, fir6, <b>fir7</b> , fir8, <b>fir12</b> , and <b>gra1</b> through <b>gra5</b> .	LTS
Action roa8: Allow revegetation by scarifying the road surface and planting seed.	Actions fir2, fir3, fir4, fir5, fir6, <b>fir7</b> , fir8, and <b>gra1</b> through <b>gra5</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
G. FIRE MANAGEMENT

**TABLE III.G-2  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO  
FIRE MANAGEMENT FROM INCREASED PUBLIC ACCESS AND USE**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u>	Level of Significance if Implemented
	Policy or Action <sup>a,b</sup>	
Policy WA15.2: Consider new trails in zones of lesser vulnerability and risk.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Action pub3: Establish information kiosks at Watershed entryways.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Action sun19: Establish a small commercial site.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Action sun20: Establish an overnight nature study area.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir8, and fir9, fir10, fir11, and fir12.</b>	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir8, and fir9, fir10, fir11, and fir12.</b>	LTS
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Policy <b>WA2</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir8, and fir9, fir10, fir11, and fir12.</b>	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

G. FIRE MANAGEMENT

**TABLE III.G-3  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS  
FROM USE OF PRESCRIBED BURNS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u>	Level of Significance if Implemented
Policy F11: Use prescribed fire to control fuels, where appropriate.	Policy <b>F9</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS
Action wil7: Create palatable re-sprouting through mechanical treatments or prescribed fire.	Policy <b>F9</b> and Actions <b>fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.</b>	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS  
 H. CULTURAL RESOURCES

**TABLE III.H-2  
 MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO CULTURAL RESOURCES  
 FROM INCREASED PUBLIC ACCESS AND USE**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u>	Level of Significance if Implemented
Action pub3: Establish information kiosks at Watershed entryways.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Action sun19: Establish a small commercial site.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Action sun20: Establish an overnight nature study area.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Policy WA15.2: Consider new trails in zones of lesser vulnerability and risk.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS
Action des8: Implement universal access impoundments at SFPUC facilities and trails.	Actions <b>saf6</b> , <b>saf7</b> , <b>saf10</b> , and des4.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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 PS = Potentially Significant  
 LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

H. CULTURAL RESOURCES

**TABLE III.H-3  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO CULTURAL RESOURCES FROM OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

<b>Policies or Management Actions that Would Result in Potential Physical Effects<sup>a</sup></b>	<b>Management Actions that Could be Required to Reduce Potential Physical Effects</b>	
	<b>Policy or Action<sup>a,b</sup></b>	<b>Level of Significance if Implemented</b>
Action haz6: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, and detention basins.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection practices.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action aqu7: Rehabilitate stream segments.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action was1: Repair/replace vault, chemical, and composting toilet as necessary.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action roa2: Relocate existing necessary high use roads/road segments in proximity to streams.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action roa3: Modify the grading and drainage of existing necessary high use roads/road segments.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action roa4: Close and retire roads that are not needed and eliminate or minimize problem erosion points by installing culverts and waterbars, or otherwise stabilizing the roadway.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

H. CULTURAL RESOURCES

**TABLE III.H-3 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO CULTURAL RESOURCES FROM OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Level of Significance if Implemented
Action roa8: Restrict access on low use roads by gates or barriers.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action fir2: Install a total of nine hydrants into water sources.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action fir3: Install and maintain a total of four helispots on SFPUC property.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action fir4: Install three additional helispots off SFPUC lands.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action fir5: Install two additional hydrants on adjacent lands.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action fir6: Install an additional water tank.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action wil7: Create palatable resprouthing through mechanical vegetation treatments or prescribed fire.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action will13: Design and install wildlife passage structures that minimize wildlife losses.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action pub3: Establish “gateway” information kiosks.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

H. CULTURAL RESOURCES

**TABLE III.H-3 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO CULTURAL RESOURCES FROM OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action pub4: Establish a Visitor Education Center.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun4: Create sideslopes on the quarry pits such that there is a gradual transition to water.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun5: Reclaim quarries with sideslopes appropriate to their proposed activity.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun10: Retain the existing Sunol maintenance facility with improvements, including equipment storage shelter, waterhouse and storage yard, parking, etc.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun11: Backfill and landscape a ¼-mile buffer zone at the mining module closest to the water storage pit, between that module and the temple.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun13: Restore the historic entry to the Sunol Water Temple.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun19: Establish a small commercial site.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun20: Establish an overnight nature study area.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action gra2: Implement structural protection measures, including fencing and other improvements.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

H. CULTURAL RESOURCES

**TABLE III.H-3 (Continued)  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO CULTURAL RESOURCES FROM OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Level of Significance if Implemented
Action gra6: Implement improvements for the San Antonio Water Protection Area.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action gra7: Implement improvements for the Calaveras Watershed Protection Area.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action gra8: Implement improvements for the Lower Alameda Creek Watershed Protection Area.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Actions <b>cul1</b> through <b>cul8</b> and Policies <b>CR1</b> through <b>CR9</b> .	PS, see Section IV.H

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

I. AESTHETICS

**TABLE III.I-1  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AESTHETIC QUALITY THROUGH INSTALLATION OF NEW FACILITIES**

<b>Management Actions that Could be Required to Reduce Potential Physical Effects</b>		
<b>Policies or Management Actions that Would Result in Potential Physical Effects<sup>a</sup></b>	<b>Policy or Action<sup>a,b</sup></b>	<b>Level of Significance if Implemented</b>
Action haz6: Identify high-risk spill potential areas and implement measures (e.g., fines, barricades, etc.).	Actions <b>des5</b> , veg1, and veg7.	LTS
Action roa2: Relocate existing necessary high use roads/road segments in proximity to streams.	Actions <b>roa12</b> , veg1, and veg7.	LTS
Action roa3: Modify the grading and drainage of existing necessary high use roads/road segments.	Actions <b>roa12</b> , veg1, and veg7.	LTS
Action fir3: Install a total of four helispots on SFPUC property.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action fir4: Install three additional helispots on adjacent non-SFPUC lands.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action fir6: Install an additional water tank.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action fir7: Identify and construct road improvements to provide better access.	Actions <b>roa12</b> , veg1, and veg7.	LTS
Action pub3: Establish information kiosks at Watershed entryways.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action sun10: Retain the existing Sunol maintenance facility with improvements, including equipment storage shelter, warehouse and storage yard, parking, etc.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action sun11: Backfill and landscape a ¼-mile buffer zone at the mining module closest to the Sunol Water Temple, between that module and the temple.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action sun13: Restore the historic entry to the Sunol Water Temple.	Actions <b>des5</b> , veg1, and veg7.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

I. AESTHETICS

**TABLE III.I-1 (Continued)  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AESTHETIC QUALITY  
THROUGH INSTALLATION OF NEW FACILITIES**

<b>Management Actions that Could be Required to Reduce Potential Physical Effects</b>		
<b>Policies or Management Actions that Would Result in Potential Physical Effects<sup>a</sup></b>	<b>Policy or Action<sup>a,b</sup></b>	<b>Level of Significance if Implemented</b>
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action sun19: Establish a small commercial site.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action sun20: Establish an overnight nature study area.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions <b>des5</b> , <b>roa12</b> , veg1, and veg7.	LTS
Action gra2: Implement structural protection measures, including fencing and other improvements.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action gra6: Implement improvements for the San Antonio Water Protection Area.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action gra7: Implement improvements for the Calaveras Watershed Protection Area.	Actions <b>des5</b> , veg1, and veg7.	LTS
Action gra8: Implement improvements for the Lower Alameda Creek Watershed Protection Area.	Actions <b>des5</b> , veg1, and veg7.	LTS
Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.	Actions <b>des5</b> , <b>roa12</b> , veg1, and veg7.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions <b>des5</b> , <b>roa12</b> , veg1, and veg7.	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Actions <b>des5</b> , veg1, and veg7.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

I. AESTHETICS

**TABLE III.I-2  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AESTHETICS THROUGH  
VEGETATION CLEARING ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action fir8: Complete the fuel management projects.	Actions <b>veg1</b> , <b>veg5</b> , <b>veg5.1</b> , and veg7.		LTS
Action wil7: Create palatable re-sprouting through mechanical vegetation treatments or prescribed fire.	Actions <b>veg1</b> , <b>veg5</b> , <b>veg5.1</b> , and veg7.		LTS
Action veg6: Identify and remove invasive exotic plant species.	Actions <b>veg1</b> and veg7.		LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

I. AESTHETICS

**TABLE III.I-3  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AESTHETICS THROUGH INCREASED PUBLIC ACCESS AND USE**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Level of Significance if Implemented
	Policy or Action <sup>a,b</sup>	
Action pub3: Establish information kiosks at Watershed entryways.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Action sun19: Establish a small commercial site.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Action sun20: Establish an overnight nature study area.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Policy WA15.2: Consider new trails in zones of lesser vulnerability and risk.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Actions saf1, saf2, <b>saf4, saf6</b> , saf10, <b>saf16</b> , saf17, <b>pub8, pub9</b> , and pub12.	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

S = Significant  
PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

J. TRANSPORTATION AND ACCESS

**TABLE III.J-1  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO TRAFFIC AND ACCESS THROUGH DEVELOPMENT OF SUNOL VALLEY RECREATIONAL FACILITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u> Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action pub4: Establish a Watershed Visitor Education Center.	None	PS, see Section IV.J
Action sun14: Develop a public recreation area around the Sunol Water Temple.	None	PS, see Section IV.J
Action sun19: Establish a small commercial site.	None	PS, see Section IV.J
Action sun20: Establish an overnight nature study area.	None	PS, see Section IV.J
Action sun21: Establish trail connections.	None	PS, see Section IV.J

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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PS = Potentially Significant  
LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

L. NOISE

**TABLE III.L-1  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS ON  
NOISE LEVELS THROUGH CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action haz6: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.		None	PS, see Section IV.L
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, and detention basins.		None	PS, see Section IV.L
Action aqu12: Install long-term sediment retention basins or other permanent measures.		None	PS, see Section IV.L
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection practices.		None	PS, see Section IV.L
Action aqu7: Rehabilitate stream segments.		None	PS, see Section IV.L
Action was1: Repair/replace vault, chemical, and composting toilet as necessary.		None	PS, see Section IV.L
Action roa2: Relocate existing necessary high use roads/road segments in proximity to streams.		None	PS, see Section IV.L
Action roa3: Modify the grading and drainage of existing necessary high use roads/road segments.		None	PS, see Section IV.L
Action roa4: Close and retire roads that are not needed and eliminate or minimize problem erosion points by installing culverts and waterbars, or otherwise stabilizing the roadway.		None	PS, see Section IV.L
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.		None	PS, see Section IV.L
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.		None	PS, see Section IV.L

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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LTS = Less Than Significant

III. ENVIRONMENTAL SETTING AND IMPACTS

L. NOISE

**TABLE III.L-1 (Continued)  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS ON  
NOISE LEVELS THROUGH CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Level of Significance if Implemented
Action roa8: Restrict access on low use roads by gates or barriers.	None	PS, see Section IV.L
Action fir2: Install a total of nine hydrants into water sources.	None	PS, see Section IV.L
Action fir3: Install and maintain a total of four helispots on SFPUC property.	None	PS, see Section IV.L
Action fir4: Install three additional helispots off SFPUC lands.	None	PS, see Section IV.L
Action fir5: Install two additional hydrants on adjacent lands.	None	PS, see Section IV.L
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	None	PS, see Section IV.L
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	None	PS, see Section IV.L
Action will13: Design and install wildlife passage structures that minimize wildlife losses.	None	PS, see Section IV.L
Action pub3: Establish "gateway" information kiosks.	None	PS, see Section IV.L
Action pub4: Establish a Visitor Education Center.	None	PS, see Section IV.L
Action des8: Implement universal access improvements at SFPUC facilities and trails.	None	PS, see Section IV.L
Action sun17: Provide universal access at Sunol Valley recreation facilities.	None	PS, see Section IV.L
Action sun4: Create sideslopes on the quarry pits such that there is a gradual transition to water.	None	PS, see Section IV.L

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

L. NOISE

**TABLE III.L-1 (Continued)  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS ON  
NOISE LEVELS THROUGH CONSTRUCTION ACTIVITIES**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Level of Significance if Implemented
Action sun5: Reclaim quarries with sideslopes appropriate to their proposed activity.	None	PS, see Section IV.L
Action sun10: Retain the existing Sunol maintenance facility with improvements, including equipment storage shelter, warehouse and storage yard, parking, etc.	None	PS, see Section IV.L
Action sun11: Backfill and landscape a ¼-mile buffer zone at the mining module closest to the Sunol Valley Water Temple, between that module and the temple.	None	PS, see Section IV.L
Action sun13: Restore the historic entry to the Sunol Water Temple.	None	PS, see Section IV.L
Action sun14: Develop a public recreation area around the Sunol Water Temple.	None	PS, see Section IV.L
Action sun19: Establish a small commercial site.	None	PS, see Section IV.L
Action sun20: Establish an overnight nature study area.	None	PS, see Section IV.L
Action gra2: Implement structural protection measures, including fencing and other improvements.	None	PS, see Section IV.L
Action gra6: Implement improvements for the San Antonio Water Protection Area.	None	PS, see Section IV.L
Action gra7: Implement improvements for the Calaveras Watershed Protection Area.	None	PS, see Section IV.L
Action gra8: Implement improvements for the Lower Alameda Creek Watershed Protection Area.	None	PS, see Section IV.L
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	None	PS, see Section IV.L

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.

<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS  
M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

**TABLE III.M-1  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS THROUGH CONSTRUCTION-RELATED EXPOSURE OF HAZARDOUS MATERIALS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action haz6: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Action <b>des9</b> .	PS, see Section IV.M
Action sto1: Remediate on-site stormwater and collection systems through infiltration drainfields and trenches, and detention basins.	Action <b>des9</b> .	PS, see Section IV.M
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection measures.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action aqu7: Rehabilitate stream segments.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action was1: Repair/replace vault, chemical, and composting toilet as necessary.	Action <b>des9</b> .	PS, see Section IV.M
Action roa2: Relocate existing necessary high use roads/road segments in proximity to streams.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action roa3: Modify the grading and drainage of existing necessary high use roads/road segments.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action roa4: Close and retire roads that are not needed and eliminate or minimize problem erosion points by installing culverts and waterbars, or otherwise stabilizing the roadway.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS  
M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

**TABLE III.M-1 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS THROUGH CONSTRUCTION-RELATED EXPOSURE OF HAZARDOUS MATERIALS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	Level of Significance if Implemented
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action roa8: Restrict access on low use roads by gates or barriers.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action fir2: Install a total of nine hydrants into water sources.	Action <b>des9</b> .	PS, see Section IV.M
Action fir3: Install and maintain a total of four helispots on SFPUC property.	Action <b>des9</b> .	PS, see Section IV.M
Action fir4: Install three additional helispots off SFPUC lands.	Action <b>des9</b> .	PS, see Section IV.M
Action fir5: Install two additional hydrants on adjacent lands.	Action <b>des9</b> .	PS, see Section IV.M
Action fir6: Install an additional water tank.	Action <b>des9</b> .	PS, see Section IV.M
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Action <b>des9</b> .	PS, see Section IV.M
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Action <b>des9</b> .	PS, see Section IV.M
Action will13: Design and install wildlife passage structures that minimize wildlife losses.	Action <b>des9</b> .	PS, see Section IV.M
Action pub3: Establish "gateway" information kiosks.	Action <b>des9</b> .	PS, see Section IV.M
Action sun4: Establish a Visitor Education Center.	Action <b>des9</b> .	PS, see Section IV.M
Action sun4: Create sideslopes on the quarry pits such that there is a gradual transition to water.	Action <b>des9</b> .	PS, see Section IV.M

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS  
M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

**TABLE III.M-1 (Continued)**  
**MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS THROUGH CONSTRUCTION-RELATED EXPOSURE OF HAZARDOUS MATERIALS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Action sun5: Reclaim quarries with sideslopes appropriate to their proposed activity.	Action <b>des9</b> .	PS, see Section IV.M
Action sun10: Retain the existing Sunol maintenance facility with improvements, including equipment storage shelter, waterhouse and storage yard, parking, etc.	Action <b>des9</b> .	PS, see Section IV.M
Action sun11: Backfill and landscape a ¼-mile buffer zone at the mining module closest to the Sunol Water Temple, between that module and the water temple.	Action <b>des9</b> .	PS, see Section IV.M
Action sun13: Restore the historic entry to the Sunol Water Temple.	Action <b>des9</b> .	PS, see Section IV.M
Action sun14: Develop a public recreation area around the Sunol Water Temple.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Action sun19: Establish a small commercial site.	Action <b>des9</b> .	PS, see Section IV.M
Action sun20: Establish an overnight nature study area.	Action <b>des9</b> .	PS, see Section IV.M
Action sun21: Establish trail connections extending to the Sunol Regional Wilderness.	Actions road12 and <b>des9</b> .	PS, see Section IV.M
Action gra2: Implement structural protection measures, including fencing and other improvements.	Action <b>des9</b> .	PS, see Section IV.M
Action gra6: Implement improvements for the San Antonio Water Protection Area.	Action <b>des9</b> .	PS, see Section IV.M
Action gra7: Implement improvements for the Calaveras Watershed Protection Area.	Action <b>des9</b> .	PS, see Section IV.M
Action gra8: Implement improvements for the Lower Alameda Creek Watershed Protection Area.	Action <b>des9</b> .	PS, see Section IV.M

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS

M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

**TABLE III.M-1 (Continued)  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS THROUGH CONSTRUCTION-RELATED EXPOSURE OF HAZARDOUS MATERIALS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Policy WA15.2: Consider new trails in zones of lesser vulnerability and risk.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Policy WA15.4: Support new trail connections that link to adjacent communities and other trail facilities.	Actions roa12 and <b>des9</b> .	PS, see Section IV.M
Policy WA18.1: Consider expansion of existing golf course in areas of low vulnerability/sensitivity.	Action <b>des9</b> .	PS, see Section IV.M
Action sun17: Provide universal access at Sunol Valley recreation facilities.	Action <b>des9</b> .	PS, see Section IV.M
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Action <b>des9</b> .	PS, see Section IV.M

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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III. ENVIRONMENTAL SETTING AND IMPACTS  
M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

**TABLE III.M-2  
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS THROUGH OPERATION-RELATED EXPOSURE OF HAZARDOUS MATERIALS**

Policies or Management Actions that Would Result in Potential Physical Effects <sup>a</sup>	<u>Management Actions that Could be Required to Reduce Potential Physical Effects</u>	
	Policy or Action <sup>a,b</sup>	Level of Significance if Implemented
Policy WA18.1: Consider expansion of existing golf course.	Actions <b>haz1</b> , <b>haz2</b> , and <b>lea3</b> .	LTS

<sup>a</sup> See accompanying text and Table II-1 in the Final Environmental Impact Report (FEIR) for a description of each management action.  
<sup>b</sup> **Bold** text indicates actions that may be essential for reducing potential significant impacts.

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**Chapter 8:  
SFPUC Resolution  
00-0229**

**Chapter 8. Plan Adoption  
SFPUC Resolution 00-0229**

**8.1 Introduction**

The text of SFPUC 00-0229 adopting the Alameda Watershed Management Plan is provided for reference.

**8.2 Text of Resolution 00-0229**

**PUBLIC UTILITIES COMMISSION**

City and County of San Francisco

RESOLUTION NO.         00-0229

WHEREAS, The San Francisco Board of Supervisors recommended that Comprehensive Watershed Management Policy and Plans be prepared by the Public Utilities Commission to provide a framework for making future decisions about watershed land and water resources while protecting the water quality of the City's watersheds and reservoirs; and

WHEREAS, The Public Utilities Commission approved the preparation of Comprehensive Watershed Management Policy and Plans by Resolution No. 91-0354, and

WHEREAS, The Public Utilities Commission identified preferred alternatives and authorized the General Manager to finalize the Alameda Watershed Management Plan Environmental Impact Report; and

WHEREAS, The Draft Programmatic Environmental Impact Report for the Alameda Watershed Management Plan was prepared and distributed to the public on December 11, 1999, and on August 3, 2000, the Department of City Planning certified as complete the Final Environmental Impact Report under the California Environmental Quality Act; now, therefore, be it

RESOLVED, That this Commission adopts the findings under the California Environmental Quality Act attached hereto as Attachment A, and, be it

FURTHER RESOLVED, That this Commission adopts the Alameda Watershed Management Plan.

*I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of*         SEP 26 2000

  
Secretary, Public Utilities Commission

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# **List of Acronyms**

## **Glossary of Terms**

## List of Acronyms

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACWD	Alameda County Water District
ACWRS	Alameda Creek Water Resources Study
ADA	Americans with Disability Act
AF	acre feet
AUM	animal unit month
BERM	Bureau of Environmental and Regulatory Management
BEPA	Bald Eagle Protection Act
BM	benchmark
BMP	Best Management Practice
BSSP	Bureau of Strategic and Systems Planning (replaces both SPARC and SPEAC)
CalTrans	California Department of Transportation
CCSF	City and County of San Francisco
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CE	Listed as Endangered, California Endangered Species Act
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CHAMP	Chemical Application Management Program
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
COE	U.S. Army Corps of Engineers
CRMP	Coordinated Resource Management Program
CSC	California Species of Special Concern
CT	Listed as Threatened, California Endangered Species Act
CWA	Clean Water Act
DBP	disinfection byproducts precursors
DHS	Department of Health Services
EBRPD	East Bay Regional Park District
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESZ	Ecological Sensitivity Zone
FC	Candidate for Federal listing (taxa for which the U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list as Endangered or Threatened)
FE	Listed as Endangered on the Federal Endangered Species List
FEIR	Final Environmental Impact Report
FESA	Federal Endangered Species Act
FPE	Proposed for listing on the Federal Endangered Species List
FT	Listed as Threatened on the Federal Endangered Species List
FY	fiscal year
GIS	geographic information system
GPS	global positioning satellite (system)
HACCP	Hazard analysis of critical control points
HCP	Habitat Conservation Plan
I-680	Interstate 680

IC	Incident Commander
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
IRMP	Integrated Resources Management Plan
LRMS	Land and Resources Management System
MEA	Major Environmental Analysis (replaces OER at City Planning)
MOU	Memorandum of Understanding
NEPA	Natural Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OER	Office of Environmental Review (now called MEA at City Planning)
OES	Office of Emergency Services
PCA	Pest Control Advisor
PG&E	Pacific Gas and Electric
RCD	Resources Conservation District
RDM	residual dry matter
ROW	right of way
RTE	rare, threatened, and endangered
RWQCB	Regional Water Quality Control Board
SDWA	Safe Drinking Water Act
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Department
SMCL	Secondary Maximum Contaminant Levels
SMP	Surface Mining Permit
SOC	synthetic organic compounds
SPARC	Systems Planning and Regulatory Compliance (now called BSSP)
SPEAC	Systems Planning, Environmental and Compliance (now called BSSP)
SRF	State Revolving Fund
SSA	State designated special animal, designated by CDFG biologists
SVWC	Spring Valley Water Company
SVWW	Spring Valley Water Works
THM	trihalomethane
TOC	total organic carbon
UEB	Utilities Engineering Bureau
ULV	ultra-low volume
USFWS	United States Fish and Wildlife Service
USFS	United States Forest Service
WPC	Watershed Planning Committee
WQVZ	Water Quality Vulnerability Zone
WTP	water treatment plant

## Glossary of Terms

- Acre-foot** - used to describe the amount of water that would cover one acre of land, one foot deep.
- Adit** - a vertical structure generally located within a reservoir through which pipes and valves pass allowing access to these pipes and valves for reservoir operations.
- Aggradation** - the accumulation of deposits of alluvium which raise the elevation of a stream bed or body of water.
- Algaecides** - chemicals or other agents used to destroy or inhibit algae.
- Allelopathic** - plants that naturally destroy surrounding vegetation to utilize all the sun and rain of the area.
- Amphibian** - a class of vertebrate animals whose young usually have gills and live in the water and later develop lungs (i.e., frogs, salamanders).
- Anadromous (fish)** - a fish that spawns and spends its early life in fresh water but moves into the ocean where it attains sexual maturity and spends most of its life span.
- Annual (grasses)** - a plant that completes its life cycle in a year or less; seed germinates and the plant grows, blooms, sets seed, and dies - all in one growing season.
- Anoxia** - a condition in which there is not enough oxygen or tissue oxidation.
- Aspect** - the direction toward which a slope faces; exposure.
- Autecology** - the study of relationships of individual species to their environment.
- Best Management Practices (BMPs)** - the techniques required to provide optimal results and minimize adverse impacts.
- Biorational (controls)** - pesticides that occur naturally or resemble naturally occurring substances.
- Commensal** - association between two different organisms in which each is beneficial to the other.
- Conductivity** - the power of conducting heat, electricity, etc.
- Cubic feet per second (cfs)** - used to describe water flowing one cubic foot per second.
- Discing** - the act of tilling/plowing soil with a round, flat object.
- Disinfection byproducts precursor** - represented by trihalomethane (THM) which refers to the natural organic carbon which exists in each watershed in the form of decayed vegetation, bark, and animal carcasses as well as animal waste.
- Dry hydrant** - an arrangement of piping with one end in the water and the other extending to dry land and available for connection to a pumper. The pipe system is non-pressurized and composed of relatively inexpensive materials. They are permanently installed in waterbodies and provide access to water in all weather conditions.
- Exotic species** - not native; foreign; those introduced from other climates or countries.
- Exploratorium** - an interactive, hands-on educational scientific museum in San Francisco which caters to children and young adults.
- Feral (animal)** - wild animals descended from previously domesticated ones.
- Fetch (erosion)** - length of area affected (i.e., wind-induced shoreline erosion along ¼ mile).

- Fuel break** - an existing barrier, or one constructed before a fire occurs, from which all or most of the inflammable materials have been removed.
- Fungicides** - any substance that kills fungi or inhibits the growth of spores.
- Geographic information system (GIS)** - data storage and retrieval by which thematic data layers are input digitally and output in the form of maps and attribute data summaries for each theme.
- Heliport** -improved area (i.e., paved) where helicopters land and take off.
- Herbicides** - chemicals used to destroy or inhibit plants.
- Herbivore** - any of a large group of animals that feed chiefly on plants.
- Hydrologic watershed** - the total area of land surface from which an aquifer or river system collects its water.
- Hypolimnetic aeration** - the process of introducing oxygen into the lower reaches of a reservoir to eliminate taste, odor, and color problems without disturbing the stratification of the reservoir; thus retaining the deep, cold water of the hypolimnion for selective withdrawal.
- Insecticides** - chemicals or other agents that kill insects.
- Lacustrine (deposit)** - material deposited in lake water and later exposed either by lowering of the water level or by elevation of the land.
- Lead agency** - government agency with the principal responsibility for approving the Plan.
- Lithology** - rock type.
- Macrophytes** - a macroscopic or large plant, especially one living in water.
- Microorganism** - any microscopic or ultramicroscopic animal or vegetable organism; especially, any of the bacteria, protozoa, viruses, etc.; pathogens; coliform.
- Model ordinance** - an ordinance drafted by SFPUC for adoption by the various entities with jurisdiction over watershed lands.
- Mycorrhiza** - an intimate relationship between the root systems of trees and soil fungi.
- Noxious (weeds or plants)** - hurtful; harmful to health or morals; destructive.
- Nutrients** - carbon, nitrogen, and phosphorus; sources include vegetation, soils, and animal wastes; associated with decaying vegetation matter and animal wastes, absorbed onto soils, or leached through runoff.
- Overwash (stream overwash)** - the drift carried by a glacier stream and deposited on or beyond a frontal moraine.
- Pacific Flyway** - a corridor for birds migrating between North and South America.
- Paleontology** - the study of past life forms through fossils.
- Particulates** - particles of matter in either the liquid or solid state.
- Pathogen** - any microorganism or virus that can cause disease.
- Perennial (grasses)** - a non-woody plant that lives for more than two years; frequently used to refer to a plant whose top growth dies down each winter and regrows the following spring, but some perennials keep their leaves all year long.
- Potable (water)** - free of contaminants.
- Predaceous (exotic aquatic species)** - preying on other animals; predatory.
- Propagula** - a gemma or bud in certain algae which serves as a means of asexual reproduction.

- Pupa** - an insect in the stage of development between the larval and adult forms.
- Raw water** - untreated water with no additives.
- Reclaimed water** - urban waste water that becomes suitable for a subsequent use as a result of treatment.
- Reinterment** - to rebury or put back into the earth.
- Rift** - an opening made by or as if by splitting; a fissure.
- Riparian** - of, designating, or situated on the banks of a river, lake, or other body of water.
- Rodenticides** - chemicals or other agents that kill rodents.
- Sedimentation** - retention of sediments by reservoirs; can result in premature siltation.
- Serpentine formation** - winding or turning one way and the other, like a moving serpent.
- Slope** - the degree of deviation of a surface from horizontal.
- Sterilants** - an agent or chemical which causes sterility.
- Stratified** - arranged in or composed of strata of layers.
- Synthetic organic compounds (SOCs) and volatile organic compounds (VOCs)** - chemicals which are generally manufactured or are by-products of manufactured chemicals. VOCs usually evaporate, while SOC, such as petroleum by-products, most frequently do not.
- Taxa** - a general term used for a taxonomic group collectively of any rank without being specific.
- Terrestrial (habitat)** - circumscribed by area; defined by physiognomic-dominant plant life-forms.
- Transpiration** - the process by which water moves up through the living plant and vapor leaves the plant and enters the atmosphere.
- Treated water** - water to which chemicals (e.g., chlorine) have been added and/or which has undergone filtration to meet drinking water standards
- Trihalomethane (precursors)** - refer to the natural organic carbon which exists in each watershed in the form of decayed vegetation, bark, and animal carcasses as well as animal waste. Used to represent the precursor for disinfection by-products (DBPs) in general.
- Turbidity** - suspended solids which pollute water; major contributor is sediment, mostly fine soil material eroded by natural geologic processes and by many land uses.
- Watershed** - the portion of the hydrologic watershed owned and managed by the San Francisco Water Department (also the Peninsula Watershed and the Alameda Watershed).
- Wetland** - transition zones from uplands to deepwater aquatic systems; include swamps, bogs, marshes, mires, fens, and other wet ecosystems; provide valuable functions such as organic exporters or inorganic nutrient sinks (filters between land and water).