



San Francisco Planning Department

PENINSULA WATERSHED MANAGEMENT PLAN

Final Environmental Impact Report

San Francisco Planning Department File No. 96.222E
State Clearinghouse No. 98082030

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**Draft EIR Public Hearing Date: February 1, 2000 (in San Mateo) and
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EIR Certification Date: January 11, 2001

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CHAPTER I

SUMMARY

This Environmental Impact Report (EIR) analyzes the physical environmental effects of the *Peninsula Watershed Management Plan* (Management Plan)¹ developed by the San Francisco Public Utilities Commission (SFPUC). As described below, the Management Plan is comprised of goals, policies, and actions that are designed to guide SFPUC management of the Peninsula Watershed (Watershed) lands. The impacts of day-to-day management activities that implement the Management Plan are analyzed at a programmatic level in this EIR and generally would not be subject to further environmental review. This is appropriate given the broad nature of most of the Management Plan recommendations. If new information becomes known that could lead to significant impacts, further environmental analysis would be required. For other management actions, the programmatic analysis will support subsequent environmental review as further details are developed regarding programs or projects.

One component of the Management Plan, the Fifield/Cahill Ridge Trail project, is analyzed at a project-level. Unless new information becomes known, such as a change in the project description that could lead to potential significant impacts, this project-level analysis would allow SFPUC to make decisions regarding this project as quickly as possible.

A. MANAGEMENT PLAN DESCRIPTION

The mission of the SFPUC is to serve San Francisco and its Bay Area customers with reliable, high quality, and affordable water and wastewater treatment while maximizing benefits from power operations and responsibly managing the resources—human, physical and natural—entrusted to its care. The 23,000-acre Peninsula Watershed encompasses reservoirs that store water from the Sierra Nevada mountains and local runoff and includes water transmission facilities that are part of a system that delivers water to about 2.4 million customers in the Bay Area. The SFPUC has developed a mission statement to guide management of the Watershed. This mission statement includes the following:

- 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 suburban customers;

¹ The *Draft Peninsula Watershed Management Plan* is available for review at the following locations: the Main Branch of the San Francisco Public Library at 100 Larkin Street (Civic Center) in San Francisco, California; the Main Branch of the San Mateo Public Library at 55 West Third Avenue, San Mateo, California; the Pleasanton Public Library at 400 Old Bernal Avenue, Pleasanton, California; and the San Francisco Planning Department, 1660 Mission Street, San Francisco, California. In addition, a copy of the Draft Management Plan is posted on the LRMS web page at www.ci.sf.ca.us/puc/lrms or available for purchase from BPS Reprographic Services at the following locations: 149 Second Street, San Francisco, California, (415) 495-8700; and 1100 Industrial Road, Unit 13, San Carlos, California (650) 631-2310.

- 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 their conservation, enhancement, restoration and maintenance while balancing financial costs and benefits.

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, SFPUC has developed the Management Plan.

The purpose of the Management Plan is to provide a policy framework for the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on the Watershed lands. To aid the SFPUC in their decision-making, the Management Plan provides a comprehensive set of goals, policies, and management actions that address all Watershed activities and reflect the unique qualities of the 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 manager and staff 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. Although the Management Plan has been developed with an effort to design realistic policies and actions, it may be that due to funding realities or changed circumstances, some actions may not be implemented or may be implemented at a later phase. In such cases, the status quo would prevail.

The Management Plan is presented in six chapters. An Introduction (Chapter 1.0) is followed by a discussion of Existing Conditions and Resource Sensitivity (Chapter 2.0). Chapter 3.0 briefly describes the major Watershed Management Issues. Chapter 4.0 describes Watershed Management Goals and Policies for each of the major management issue areas established in Chapter 3.0. Chapter 5.0 presents the actions and guidelines that form the basis of the Management Plan. This crucial chapter is followed by a discussion of Phasing and Implementation (Chapter 6.0).

The Management Plan was designed to improve the SFPUC's ability to protect its overall Watershed in general and in particular the specific resources that make up that Watershed. Given the intention behind the Management Plan design, the overall environmental impacts of the Management Plan are beneficial. However, although most actions were developed to benefit the environment, some do have the potential to have direct physical impacts. These actions are described in Chapter II of this document, and the analysis of these actions forms the core of this EIR.

Various physical changes are proposed by management actions in the Management Plan, including facilities such as a Watershed Visitor Education Center, information kiosks, and fire fighting response facilities (hydrants, helipads, etc.). Management actions dictate vegetation clearing proposed for operations and maintenance activities and fire hazard reduction. General physical changes associated with trail development are proposed and are discussed at a programmatic level. Specifically, two trail segments are proposed under Management Plan actions, but sufficient detailed information has not been developed to analyze them at a project-level. These are a trail which would extend the proposed Fifield/Cahill Ridge Trail south of State Route 92, and a short connector trail between Sneath Lane and the existing San Andreas Trail. As described below, the Fifield/Cahill Ridge Trail is examined at a project-level in this EIR.

B. FIFIELD/CAHILL RIDGE TRAIL (PROJECT-LEVEL ANALYSIS)

Four alternatives have been developed for the proposed Fifield/Cahill Ridge Trail. These alternatives were developed to meet the objective of SFPUC resolution no. 97-0177, which was to establish a public access trail within the Watershed, along the Fifield/Cahill Ridge. This trail would become a segment of the Bay Area Ridge Trail. Trail Alternatives A and B were proposed by the Bay Area Ridge Trail Council (BARTC). All four alternatives meet the objective of resolution no. 97-0177, and together they bracket a wide range of access policy alternatives and are addressed at a project-level in this EIR. As noted above, there are other trails included in the Management Plan that are discussed at a program level. All four Fifield/Cahill Ridge Trail alternatives share the same alignment for most of the proposed trail. The alternatives vary in terms of operation and restrictions. Alternatives A and B are similar in that both provide for unrestricted public access to hikers, bicyclists, and equestrians along the Fifield/Cahill Ridge service road, but would utilize different alignment routes at the southern portion of the trail route. Alternatives B, C, and D share the same alignment, but differ primarily in terms of access restrictions. As stated above, Alignment B would provide unrestricted public access to hikers, bicyclists, and equestrians. Alternative C would provide access to hikers by annual permit. Alternative D would provide docent-led access to hiking groups of 25 people or less. All alternatives would require improvements such as restroom facilities and parking lots.

C. PRINCIPAL ENVIRONMENTAL EFFECTS

Principal among the program-level issues addressed in this environmental impact report for the *Peninsula Watershed Management Plan* are the issues of increased public access and use and operations, maintenance, and construction activities. These are also the principal issues of concern for the project-level analysis of the proposed Fifield/Cahill Ridge Trail. The impacts associated with increased public access and use, operations, maintenance, and construction activities, and implementation of the Fifield/Cahill Ridge Trail project were found to be at less than significant levels or to be mitigated to a less than significant level with mitigation measures identified in the analysis.

1.0 PROGRAM-LEVEL IMPACTS

1.1 INCREASED PUBLIC ACCESS AND USE

Under the Management Plan, several new public recreation facilities could be developed on the Watershed, including a Watershed Visitor Education Center and new recreation trails. These uses are designed generally as low intensity recreation. Operation of these facilities could result in potentially significant physical effects to Watershed resources, as summarized below.

Geology and Soils. Increased use of existing hiking, bicycle, and horse trails can lead to deepening of existing trails and the development of “shortcut” trails that, over time and with sufficient surface water runoff, can become erosional channels. The experience of other open space managers has shown that more serious degradation occurs on property where bicycles are allowed. Establishing new trails can also increase erosion. In addition, increased public use of the Watershed could lead to reduced slope stability in some areas. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Hydrology and Water Quality. Increased and more extensive public use of the Watershed could affect water quality as a result of inadequate sanitation facilities, unauthorized body-contact with reservoir or creek waters, unauthorized use by domestic animals, unauthorized fishing in reservoirs and creeks, littering, and increased potential for fire hazard. Depending on the specific activity, public use could inadvertently result in degradation of water quality, either by adding contaminants to surface runoff or to seepage that eventually reaches groundwater. In addition, public use has the potential to adversely affect vegetation and soil, which could lead to increased erosion and sedimentation, and indirectly affect water quality. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Natural Resources. Increased human disturbance, such as littering, poaching, excessive noise, or habitat destruction, could result in wildlife harassment if the disturbance were intense and/or prolonged, the species sensitive, or the disturbance led to changes in wildlife or plant community composition. In addition, increased public access and use could increase the density and distribution of invasive plant species on the Watershed. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Fire Management. Increased public visitation of the Watershed could lead to increased incidences of unauthorized uses, such as arson, smoking, and campfires/cooking fires. In addition, high-volume off-trail activity and other uses that occur outside designated areas could damage vegetation, resulting in an increase in dry litter that is easily ignitable. The increased public visitation under the Management Plan could cause potentially significant fire ignition risks. The Management Plan includes substantial improvement in SFPUC’s ability to reduce the risk of fire ignition and management actions included in the Management Plan would reduce these potential impacts to a less than significant level, however the risk is still serious.

Cultural Resources. Increased public access to and use of the Watershed could result in an increase in disturbance of both known and unknown cultural resources. Depending on the

location of new trails and facilities, this could include significant disturbance to resources during construction of facilities, vandalism, or inadvertent damage to cultural resources during long-term use. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Aesthetics. Increased public access and use would not necessarily result in adverse aesthetic impacts. However, trespassing and improper use of public access areas could lead to litter, disturbed vegetation, and damage to Watershed facilities and resources, detracting from the aesthetic quality of the Watershed. Litter, disturbed vegetation, and damage to facilities and resources would constitute a significant effect if the degradation of aesthetic quality were substantial. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Transportation and Access. The effect of new vehicular traffic associated with new recreation facilities on parking conditions, and the potential for unmet parking demand that leads to hazardous pedestrian and traffic conditions (e.g., people could choose to park improperly on walkways or roadways, forcing pedestrians and vehicles to make potentially dangerous maneuvers), would be contingent on the supply of parking spaces at and near the recreation facilities, and could be significant. A mitigation measure included in this EIR would reduce these potential impacts to a less than significant level.

- **Hazardous Materials and Hazardous Waste.** If public use opportunities were provided at Skyline Quarry, in addition to or in place of the Fifield/Cahill Ridge Trail, the potential exists for people to be exposed to contamination from material and debris related to the detonation site while investigating open cuts or other exposed geologic features. These impacts could be significant. Management actions included in the Management Plan and an additional mitigation measure included in this EIR would reduce these potential impacts to a less than significant level.

Other Topics. Increased public use of the Watershed would not have a significant impact on land use, air quality, public services and utilities, noise, hazardous materials and hazardous waste, or energy resources.

1.2 OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES

Implementation of the Management Plan could generate construction projects associated with new recreation facilities, as well as facilities and improvements associated with water supply facilities. Implementation of the Management Plan would also result in some changes to existing Watershed operations and maintenance procedures. These activities could result in physical effects to Watershed resources, as summarized below.

Geology and Soils. Development of new Watershed facilities and improvements, as well as other activities that could remove vegetative cover, could increase direct exposure of dirt to erosional forces, particularly if increased use occurs on high use roads that are sources of erosion and sedimentation. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Hydrology and Water Quality. Construction activities typically involve grading and other earthmoving activities that can lead to excess sedimentation and erosion, which would impact water quality and could exacerbate natural sedimentation processes, alter stream channels, and result in cumulative build-up of sediments, gradually reducing the water storage capacity of reservoirs. Long-term facility operations would typically increase the area of impervious surfaces as well as introduce man-made chemicals and other materials into the Watershed. These erosion by-products could in turn enter stormwater runoff and affect the quality of receiving waters. Operations and maintenance activities include stormwater control, hazardous materials management, facility maintenance, road maintenance, vegetation and pest control, slide repair, controlled burning, etc. Unless appropriate precautions were employed, any of these activities could result in inadvertent impacts to water quality and Watershed resources. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Natural Resources. Operations, maintenance, and construction activities could directly disturb native plant communities as a result of trampling, removing, or continued or repeated disruption of vegetation. Such disturbance could modify the structure, composition, and diversity of the plant community. These activities could also lead to an increase in invasive plant species. In addition, construction could disturb trees (either through damage or removal) that provide potential roosting and nesting sites for various raptors and other birds that are protected by CDFG Code 3503 and 3503.5 and the Migratory Bird Treaty Act. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Air Quality. Construction projects would generate fugitive² dust and other criteria air pollutants primarily through excavation activities, exhaust from construction equipment and haul truck trips, and exhaust from construction-worker commute trips. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Fire Management. Implementation of some road management actions (road abandonment) could result in natural revegetation of roads and may lead to herbaceous fuel loading and an increase in wildfire risk. This increase in wildfire risk could substantially interfere with emergency response plans and expose people or structures to a substantial risk of loss. The management plan calls for use of prescribed burns. The risks of using fire to modify fuels are primarily from smoke production, exposure of visitors to fire outbreak under difficult rescue conditions, and potential escape of the fire from prescribed burn boundaries. Thus, prescribed burns would pose a potentially significant safety risk to SFPUC staff, visitors, adjacent landowners, and occupants. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

- **Cultural Resources.** Watershed operations, maintenance, and construction activities could result in potentially significant damage to both known or unknown cultural resources. Activities involving surface disturbance, such as ground clearing, discing, grading, and prescribed burns, or

² “Fugitive” emissions generally refer to those emissions that are released to the atmosphere by some means other than through a stack or tailpipe.

excavation within identified zones of cultural sensitivity, would have the greatest potential for disturbance of previously unidentified cultural resources. Management actions included in the Management Plan and additional mitigation measures included in this EIR would reduce these potential impacts to a less than significant level.

Aesthetics. Installation of new Watershed facilities would constitute a potentially significant aesthetic change, with the degree of aesthetic change dependent on project-specific details to be determined at the time the projects are proposed. The aesthetic change would be significant if the site selection, facility scale, and facility design caused substantial degradation of the scenic quality of the Watershed from public areas. Furthermore, if lighting associated with the facility created substantial glare, the aesthetic impact would be significant. In addition, vegetation-clearing activities could result in aesthetics effects depending on the size and location of the disturbed area. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

- **Hazardous Materials and Hazardous Waste.** Construction of the facilities proposed under the Management Plan would require the excavation and disturbance of soils and groundwater that may be contaminated. Dewatering of contaminated groundwater from trenches and other excavations could expose individuals and the environment to hazardous levels of contaminants. Similarly, body contact with contaminated soil or groundwater could lead to inadvertent exposure to contaminated materials. Furthermore, dust composed of contaminated soil particles could be inhaled. Facilities proposed under the Management Plan are not likely to involve the use or storage of significant amounts of hazardous materials. Management actions included in the Management Plan and an additional mitigation measure included in this EIR would reduce these potential impacts to a less than significant level.

Other Topics. Operations, maintenance, and construction activities would not have a significant impact on land use, noise, public services and utilities, or energy resources.

2.0 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

2.1 INCREASED PUBLIC ACCESS AND USE

Under the project-level assessment of the Fifield/Cahill Ridge Trail proposal, each of four trail alignments and operation proposals could result in potentially significant physical effects to Watershed resources, as briefly described below. In general, additional mitigation measures are required in order to reduce potential impacts to a less than significant level. More extensive mitigation measures, particularly relating to natural resources, are required for Alternatives A and B, which call for unlimited access. Alternatives C and D are more easily mitigated.

Geology and Soils. Additional public use along the Fifield/Cahill Ridge service road could result in a greater number of unauthorized off-trail entries onto the Watershed if users do not abide by use restrictions and stay on designated routes. Unauthorized entry could lead to formation of unsanctioned shortcut trails extending from the ridgeline to the adjoining valleys. The use of unsanctioned trails could consequently result in increased soil erosion. The experience of other

open space managers has shown that more serious degradation occurs on property where bicycles are allowed. Establishing new trails can also increase erosion. In addition, the use of unsanctioned trails could lead to reduced slope stability in some areas. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

- **Hydrology and Water Quality.** Additional public use along the Fifield/Cahill Ridge service road could affect water quality as a result of inadequate sanitation facilities, littering, and increased potential for fire hazard. In addition, unauthorized trail activities could have an impact on water quality if such activities result in unauthorized body contact with reservoir or creek water, unauthorized use by domestic animals, or unauthorized fishing in reservoirs and creeks. In addition, unauthorized off-trail uses in public access areas of higher water quality vulnerability, such as the saddle between Fifield and Cahill ridges (the Five Points area) would result in greater potential for adversely affecting water quality. Management actions included in the Management Plan and additional mitigation measures included in this EIR would reduce these potential impacts to a less than significant level.
- **Natural Resources.** The Fifield/Cahill Ridge service road passes through or is adjacent to potential habitat for several threatened, endangered, or otherwise sensitive species. Although the Watershed currently has a low density and limited distribution of invasive plant species, the adjacent lands have a high density and number of invasive, non-native grasses (e.g., pampass grass), forbs (e.g., purple star thistle), and shrubs (french broom). With increased activity associated with public use of Fifield/Cahill Ridge, invasive species would likely be transported by visitors onto Watershed lands at a greater rate than occurs at present. Increased human disturbance, such as littering, excessive noise, or vegetation trampling, could result in wildlife harassment if the disturbance were intense and/or prolonged, the species sensitive, or the disturbance led to changes in wildlife or plant community composition. In particular, public use of Fifield/Cahill Ridge could attract corvids and result in increased predation of nesting birds. A catastrophic fire caused by increased visitor use would adversely affect plant and wildlife species and reduce the diversity of wildlife, since most plant and wildlife species in the Watershed are not adapted to catastrophic fires. Management actions included in the Management Plan and additional mitigation measures proposed in this EIR would reduce these potential impacts to a less than significant level.

Fire Management. Fire hazards along Fifield and Cahill ridges are highly variable. Increased public visitation along these ridges could lead to increased incidences of unauthorized uses if users do not abide by use restrictions, such as smoking, arson, and campfires/cooking fires. Unauthorized off-trail activity and other uses that occur outside designated areas could damage vegetation, resulting in an increase in dry litter that is easily ignitable. The Management Plan includes substantial improvement in SFPUC's general ability to reduce the risk of fire ignition. Management actions included in the Management Plan and a mitigation measure included in this EIR would reduce potential impacts from the development of the Fifield/Cahill Ridge Trail to a less than significant level, however the risk is still serious.

Cultural Resources. Fifield/Cahill Ridge, between the Portola and Cemetery gates, has been identified as a zone of cultural resource sensitivity. Additional public use along the Fifield/Cahill Ridge service road could result in an increase in disturbance of both known and unknown cultural resources. In particular, unauthorized off-trail use could result in damage to historic structures at Pilarcitos Reservoir and Stone Dam. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Aesthetics. Increased use of the ridge for recreation use could result in improper use of the area, resulting in damage to vegetation, litter, and off-trail use by bikers and others. Improper use and damage of the area would result in decreased aesthetic quality to Ridge Trail users. Use of the Ridge Trail would be concentrated at trailheads and litter and vegetation damage at trailheads could be visible to the off-site areas, detracting from the aesthetic quality of those areas. In addition, improper use could result in fires, resulting in widespread disturbance of vegetation in the Watershed, including devegetated, blackened areas. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

- **Transportation and Access.** Roadways that would provide access to parking areas for potential trailheads for the Fifield/Cahill Ridge Trail are Sneath Lane (northern location) and State Route 92 and Skyline Boulevard (southern trailhead location). In general, the amount of vehicular traffic generated by users of the Fifield/Cahill Ridge Trail would be influenced by the availability of parking at the trailheads. Impacts focus on the potential for unmet parking demand that leads to hazardous pedestrian and traffic conditions (e.g., people could choose to park improperly on walkways or roadways, forcing pedestrians and vehicles to make potentially dangerous maneuvers). Other impacts could occur as a result of hazardous turns being made off of SR 92 into available parking areas and spillover at trailhead parking lots. These impacts could be significant. Management actions included in the Management Plan and additional mitigation measures included in this EIR would reduce these potential impacts to a less than significant level.

Noise. Under Alternative A, there would be a potential for noise conflicts between cemetery users and trail users. Implementation of a mitigation measure proposed in this EIR would reduce these potential impacts to a less than significant level.

- **Hazardous Materials and Hazardous Waste.** Under Alternatives B, C, and D, the Fifield/Cahill Ridge Trail would terminate at Skyline Quarry. The potential exists for trail users to be exposed to contamination from material and debris related to the detonation site while investigating open cuts or other exposed geologic features. These impacts could be significant. Management actions included in the Management Plan and an additional mitigation measure included in this EIR would reduce these potential impacts to a less than significant level.

Other Topics. Increased public use along the Fifield/Cahill Ridge service road would not have a significant impact on land use, air quality, public services and utilities, or energy resources.

2.2 OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES

Numerous construction activities would be required to implement increased access. These activities include, but are not limited to: (1) construction of a parking lot at Skyline Quarry (Alternative B, C and D) or at CalTrans and SFPUC property near Highway 92 (Alternative A); (2) improvements to the Sneath Lane parking area (Alternatives A and B); (3) installation of restroom facilities (all alternatives); (4) installation of support facilities that include telephones and water faucets (all alternatives); (5) installation of access and ecological resource barriers and ecological and water quality monitoring stations (Alternatives A, B, and C); (6) installation of signage and potential disabled access improvements (all alternatives); (7) and construction of the Sweeny Ridge connector trail (Alternatives C and D). In areas proposed for parking lot construction or improvement, the land is either bare and highly disturbed (i.e., Skyline Quarry and Sneath Lane), or paved (i.e., CalTrans property), and occurs near native and non-native trees.

Geology and Soils. Development of the Fifield/Cahill Ridge Trail facilities and improvements could remove vegetative cover and increase direct exposure of dirt to erosional forces, particularly if increased use occurs on high use roads that are sources of erosion and sedimentation. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Hydrology and Water Quality. Construction activities typically involve grading and other earthmoving activities that can lead to excess sedimentation and erosion, which would impact water quality and could exacerbate natural sedimentation processes, alter stream channels, and result in cumulative build-up of sediments, that gradually reduce the water storage capacity of reservoirs. Construction of parking lots would typically increase the area of impervious surfaces as well as introduce man-made chemicals and other materials into the Watershed. These erosion by-products could in turn enter stormwater runoff and affect the quality of receiving waters. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Natural Resources. Operations, maintenance, and construction activities could directly disturb native plant communities as a result of trampling, removing, or continued or repeated disruption of vegetation. Such disturbance could modify the structure, composition, and diversity of the plant community. These activities could also lead to an increase in invasive plant species. In addition, construction could disturb trees (either through damage or removal) that provide potential roosting and nesting sites for various raptors and other birds that are protected by CDFG Code 3503 and 3503.5 and the Migratory Bird Treaty Act. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

Air Quality. Fifeild/Cahill Ridge Trail construction projects would generate fugitive dust and other criteria air pollutants primarily through excavation activities, exhaust from construction equipment and haul truck trips, and exhaust from construction-worker commute trips. Management actions included in the Management Plan would reduce these potential impacts to a less than significant level.

- **Cultural Resources.** Fifield/Cahill Ridge Trail maintenance and construction activities could result in potentially significant damage to both known or unknown cultural resources. Activities involving surface disturbance, and ground clearing, grading, and excavation within identified zones of cultural sensitivity, would have the greatest potential for disturbance of previously unidentified cultural resources. Management actions included in the Management Plan and additional mitigation measures included in this EIR would reduce these potential impacts to a less than significant level.
- **Hazardous Materials and Hazardous Waste.** Construction of the proposed Fifield/Cahill Ridge Trail facilities would require the excavation and disturbance of soils and groundwater that may be contaminated. Dewatering of contaminated groundwater from trenches and other excavations could expose individuals and the environment to hazardous levels of contaminants. Similarly, body contact with contaminated soil or groundwater could lead to inadvertent exposure to contaminated materials. Furthermore, dust composed of contaminated soil particles could be inhaled. Management actions included in the Management Plan and an additional mitigation measure included in this EIR would reduce these potential impacts to a less than significant level.

Other Topics. Operations, maintenance, and construction activities would not have a significant impact on land use, fire management, noise, public services and utilities, or energy resources.

C. MITIGATION MEASURES

- Chapter IV, Program-level Mitigation Measures and Chapter VI, Fifield/Cahill Ridge Trail Mitigation Measures, propose mitigation measures for the potentially significant environmental impacts discussed in Chapters III and V of this EIR. Mitigation measures identified in this report are designed to ensure that all applicable Management Plan management actions are implemented that are necessary to reduce the impact of implementation of other management actions. Additional mitigation measures identified in this report are proposed for two categories of impacts:
 - Impacts for which the *Peninsula Watershed Management Plan* does not include management actions that would reduce the impacts.
 - Impacts for which the *Peninsula Watershed Management Plan* does include management actions that would reduce the impacts, but not to a less than significant level.

1.0 PROGRAM-LEVEL MITIGATION MEASURES

1.1 INCREASED PUBLIC ACCESS AND USE

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Some of the actions may be essential to reduce potential impacts and are shown in bold typeface in tables within the discussion of each resource area in Chapter III. These essential actions, as well as the other actions that would further reduce potential physical effects, would reduce

potential impacts to geology and soils, water quality, natural resources, fire management, cultural resources, and aesthetics associated with public access and use to a less than significant level.

Section IV.J includes a mitigation measure that would reduce potential hazardous traffic conditions to a less than significant level through provision of sufficient parking spaces and monitoring parking adjacent to public use areas. Section IV.M includes a mitigation measure that would reduce potential hazardous materials impacts associated with the Skyline Quarry to a less than significant level through site remediation requirements.

1.2 OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Some of the actions may be essential to reduce potential impacts and are shown in bold typeface in tables within the discussion of each resource area in Chapter III. These essential actions, as well as the other actions that would reduce potential physical effects, would reduce potential impacts to geology and soils, water quality, air quality, fire management, and aesthetics associated with operations, maintenance, and construction activities to a less than significant level.

Section IV.H identifies mitigation measures that would reduce potential impacts to historic resources to a less than significant level by requiring that alteration of historic resources be in accordance with required standards and prohibiting demolition or removal of historic structures. Section IV.M includes a mitigation measure that would reduce potential impacts associated with hazardous materials and hazardous waste exposure related to construction activities to a less than significant level through remediation requirements.

2.0 FIFIELD/CAHILL RIDGE TRAIL MITIGATION MEASURES (PROJECT-LEVEL)

Mitigation of impacts from implementation of the Fifield/Cahill Ridge Trail project relies on management actions from the Management Plan and other mitigation proposed in this EIR. The management actions that may be essential, as well as the other actions that would further reduce potential physical effects are discussed in Chapters III and IV. These management actions and mitigation measures would reduce potential impacts to geology and soils, air quality, cultural resources, aesthetics, and hazardous materials and hazardous waste to a less than significant level.

Section VI.D includes a mitigation measure that would reduce potential impacts associated with stormwater runoff from the public access parking lots to the Watershed. A mitigation measure is also included in this section that provides detailed components of a water quality-monitoring program.

Section VI.E identifies eight mitigation measures. All of these measures would be required to mitigate the potential impacts from Alternatives A and B. Mitigation Measures 1 through 7 would be required to mitigate the potential impacts from Alternative C and Mitigation

Measures 1 through 3 would be required to mitigate the potential impacts from Alternative D. Mitigation Measures 1 through 3 address, the location of amenities, signage to mark sensitive habitat, and a requirement for butterfly monitoring. Mitigation Measures 4 through 7 allow for the investigation and establishment of a carrying capacity for future use thresholds, installation of fencing, seasonal trail prohibitions, and the option of establishing a user surveillance system. Mitigation Measure 8 requires additional habitat conservation and resource security plans.

Section VI.G includes a mitigation measure that calls for extensive tree maintenance north of Skyline Quarry to remove public safety and fire hazards. Section VI.J includes mitigation measures that control parking at trailhead parking lots and nearby areas, develop signage, and restrict left turns from SR 92. These mitigation measures would reduce would reduce traffic safety impacts resulting from implementation of the Fifield/Cahill Ridge Trail project to a less than significant level.

Section VI.L includes a mitigation measure that would reduce potential noise impacts through and around the Skylawn Memorial Park. This mitigation is not required under Alternatives B, C, and D.

D. MANAGEMENT PLAN ALTERNATIVES

- Prior to preparation of the *Peninsula Watershed 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 analysis of data was combined with public comments and public survey results to form three watershed management alternatives. Alternative A would include management actions that provide for the highest improvement in water quality and emphasizes ecological resource protection and enhancement. Public access would be very limited under Alternative A. Alternative B would include management actions that provide for moderate improvement in water quality and balanced ecological resource protection and public access and activity. Alternative C would include management actions that provide a slight improvement in water quality and emphasizes increased public access and activity. 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. Alternative A is the environmentally superior alternative. Chapter IX of this EIR provides a comparison between the impacts of the preferred alternative and those of the No Action Alternative and Alternatives A, B, and C.

E. UNRESOLVED ISSUES AND AREAS OF CONTROVERSY

The City and County of San Francisco has received comments from Golden Gate National Recreation Area (GGNRA) in response to the Notice of Preparation issued for this document regarding their position that environmental review of the Management Plan should include development of an Environmental Impact Statement (EIS) under the National Environmental Protection Act (NEPA). It is the position of the City and County of San Francisco that NEPA

review is not required for adoption of a management plan on City owned and operated property. The Management Plan is not being federally funded and no federal approvals are necessary to adopt the Management Plan. GGNRA is party to a Scenic Easement over a portion of the property, and the easement provides for review of SFPUC decisions made with regard to the use of these lands. However, major physical environmental issues that would be analyzed under NEPA review have been thoroughly addressed in this EIR.

Another area of controversy involves the appropriate level of public access and use of the Watershed for recreational activities. Increased public access and use increases the risk of fire, water quality degradation, natural resource, and other impacts. The Management Plan attempts to balance protection of the water supply with some increase in public access and use of the Watershed. Some persons will likely feel that the proposed amount of public access should be increased. Other persons may feel that the proposed amount of public access is too great to ensure maximum protection of the water supply and natural resources. This EIR analyzes the impacts and suggests mitigation measures for the proposed level of public access and use, and analyzes the impacts of alternatives calling for lesser and greater amounts of public access and use. With regard to the project-level analysis of the Fifield/Cahill Ridge Trail, the proposed project may be considered a change in program. If so, accessibility improvements under the Americans with Disabilities Act would be required. These improvements could be minimal (installing new signage) or substantial (providing a similar experience on a new, accessible spur trail, and/or regrading segments of the existing road to reduce slope cross-slope and to provide a firm and stable surface).

Chapter III of this EIR analyzes, at a program level, the potential environmental impacts of a broad range of policies and management actions proposed by the *Peninsula Watershed Management Plan*. For implementation of many proposed policies and management actions, their environmental effects are analyzed in sufficient detail to allow this EIR to fully satisfy CEQA. For example, the impacts of day-to-day management activities that implement the Management Plan are analyzed in this EIR and would generally not be subject to further environmental review. However, implementation of certain management actions could require further environmental review at the time more specific projects are proposed. The San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Generally, further environmental review would be necessary if new significant environmental effects beyond those identified in this EIR would occur as a result of changes in the project or new circumstances or information, or if new mitigation measures or alternatives that would reduce one or more significant effects of the project are found to be feasible but SFPUC declines to adopt the measure or alternative (CEQA Guidelines Section 15162). Table II-1 in the Project Description chapter identifies the specific management actions that are likely to require further environmental review.

CHAPTER II

PROJECT DESCRIPTION

This Environmental Impact Report (EIR) assesses the potential environmental impacts of implementation of the *Peninsula Watershed Management Plan* proposed by the San Francisco Public Utilities Commission (SFPUC).¹ This document has been prepared in accordance with the California Environmental Quality Act (CEQA). The SFPUC is the project sponsor, and the San Francisco Planning Department is the lead agency for the CEQA process. This chapter of the EIR discusses the following topics:

- A. Peninsula Watershed Management Plan
- B. Management Plan Summary
- C. Related Projects and Studies
- D. Approach and Organization of the EIR
- E. Environmental Review Process

A. PENINSULA WATERSHED MANAGEMENT PLAN

1.0 PROJECT OBJECTIVES AND NEED FOR THE MANAGEMENT PLAN

The predecessors of the SFPUC envisioned protected watershed lands that would provide a pure and reliable water supply for the developing population and economy of San Francisco. In the last half of the 19th century, the Spring Valley Water Works and the Spring Valley Water Company began purchasing the watershed lands that are now managed by the SFPUC. Since the purchase and management of these watershed lands by the City and County of San Francisco, beginning in the late 1920's, the Peninsula Watershed (Watershed) remains largely protected and continues to serve its primary purpose – to collect and store a reliable supply of high-quality water for the homes and businesses in the San Francisco Bay Area. In addition, and as a result of this history of protection, the Peninsula Watershed contains a variety of habitats that support more endangered plants and animals than any other location in the San Francisco Bay Area, and it has been designated as both a fish and a game refuge by the California Department of Fish and Game.

¹ The *Draft Peninsula Watershed Management Plan* is available for review at the following locations: the Main Branch of the San Francisco Public Library at 100 Larkin Street (Civic Center) in San Francisco, California; the Main Branch of the San Mateo Public Library at 55 West Third Avenue, San Mateo, California; the Pleasanton Public Library at 400 Old Bernal Avenue, Pleasanton, California; and the San Francisco Planning Department, 1660 Mission Street, San Francisco, California. In addition, a copy of the Draft Management Plan is posted on the LRMS web page at www.ci.sf.ca.us/puc/lrms or available for purchase from BPS Reprographic Services at the following locations: 149 Second Street, San Francisco, California, (415) 495-8700; and 1100 Industrial Road, Unit 13, San Carlos, California (650) 631-2310.

The mission of the SFPUC is to serve San Francisco and its Bay Area customers with reliable, high-quality, and affordable water and wastewater treatment while maximizing benefits from power operations and responsibly managing the resources—human, physical, and natural—entrusted to its care. In addition, the SFPUC has developed a mission statement to guide management of the Watershed. This mission statement includes the following:

- 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 suburban 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 their conservation, enhancement, restoration, and maintenance while balancing financial costs and benefits.

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, SFPUC has developed the *Peninsula Watershed Management Plan* (Management Plan).

The purpose of the Management Plan is to provide a policy framework for the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on the Watershed lands. To aid the SFPUC in its decision-making, the Management Plan provides a comprehensive set of goals, policies, and management actions that address all Watershed activities and reflect the unique qualities of the Watershed.

In addition to serving as a long-term regulatory framework for decision-making by the SFPUC, the Management Plan is 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 manager and staff 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. Although the Management Plan is meant to provide realistic policies and actions, it may be that due to funding realities or changed circumstances, some actions may not be implemented or may be implemented at a later phase. The impact analysis in this EIR accounts for this possibility whenever possible. In such cases, the status quo would prevail.

The Management Plan stresses long-term, balanced management of the Watershed and looks 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 protection of Watershed resources. Furthermore, the Management Plan recognizes that to be effective, Watershed management must treat all of the Watershed's natural and man-made resources—vegetation, wildlife, soils, streams, cultural

resources—as an integrated whole of interdependent parts. Integrated management ensures that maintenance of high-quality water is the primary long-term function of the Watershed.

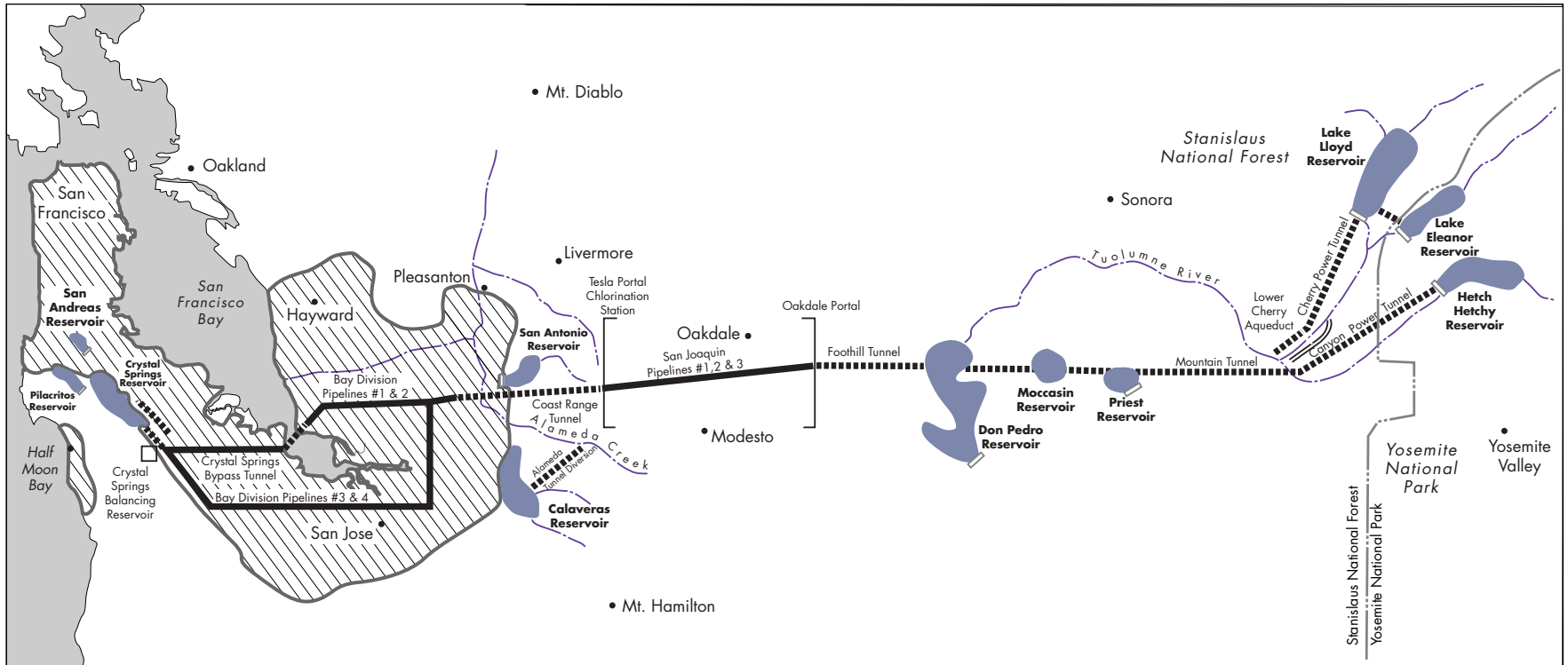
2.0 WATER SYSTEM OVERVIEW

The SFPUC's water system is located in central California and encompasses watersheds in the San Francisco Bay Area and the Sierra Nevada mountains (see Figure II-1). The SFPUC's service area includes 2.4 million customers in San Francisco and in portions of San Mateo, Santa Clara, and Alameda Counties. An overview of the SFPUC water system and the Peninsula Watershed is provided below. A more detailed description of the components of San Francisco water system and the SFPUC departments is provided in Section III.K, Utilities and Public Services.

The 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 within the greater Alameda watershed; and (3) local runoff in the Crystal Springs, San Andreas, and Pilarcitos Reservoir watersheds within the greater Peninsula Watershed. Approximately 85 percent of the potable (drinking) water 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.

There are 11 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 (Lloyd, Eleanor, and Hetch Hetchy) feed the Hetch Hetchy Water and Power system. A portion of the water supply diverted into the Hetch Hetchy system is returned to the Tuolumne River in the Sierra Nevada range to satisfy fishery requirements and to satisfy contractual agreements with the Modesto and Turlock Irrigation Districts. Of the three reservoirs in Tuolumne County, Priest and Moccasin Reservoirs regulate the flow of water to the Moccasin Power House. Don Pedro Reservoir is used for flood control and to bank water in order to meet downstream water obligations in dry years. The Hetch Hetchy system delivers up to 300 million gallons of water 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.

The greater Bay Area portion of the system includes 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. Water from these local water sources is blended with Hetch Hetchy water. A portion of the 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 through Alameda County, across the San Francisco Bay, and up the Peninsula to San Francisco. Another



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

Figure II-1
Overall SFPUC Water System

portion of Hetch Hetchy water may be stored in Peninsula reservoirs where it can be blended with Peninsula Watershed runoff and treated at the Harry W. Tracy WTP.

Sixty-five percent of the total water system volume is transmitted to 29 Bay Area resellers. These resellers serve 1,630,000 non-San Francisco customers 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 customers.

3.0 LOCATION AND STUDY AREA

The 23,000-acre Peninsula Watershed is located in central San Mateo County, south of the City and County of San Francisco (see Figure II-2). Virtually all of the hydrologic watershed is owned by the City and County of San Francisco under the jurisdiction of the SFPUC. The Watershed includes the San Andreas and Crystal Springs Reservoirs, which are adjacent to Interstate 280 (I-280), and the Pilarcitos Reservoir to the west. Figure II-3 provides a schematic delineation of the Watershed and Watershed facilities; Figure II-4 shows the Watershed on a topographic base.

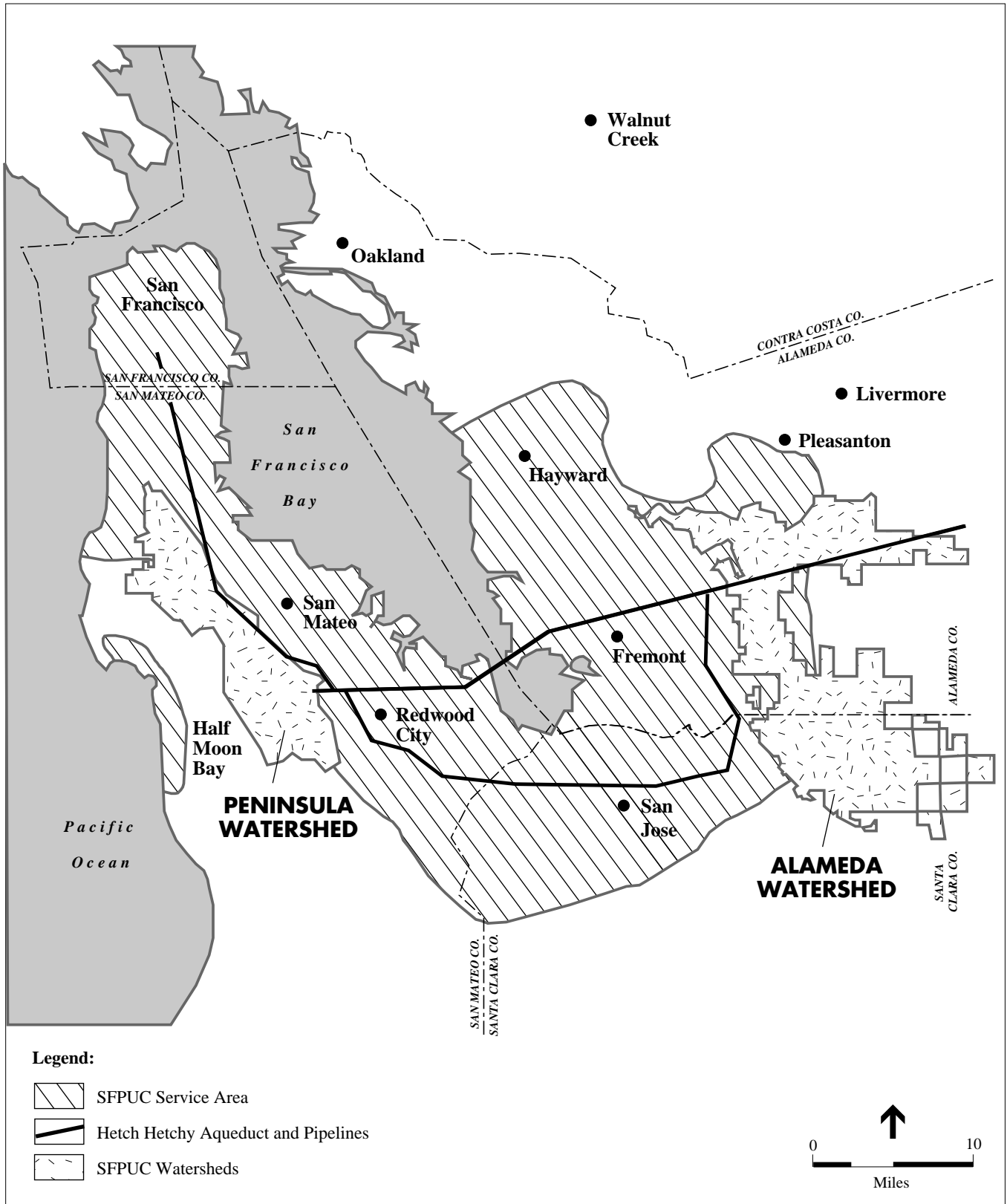
State Route 92 (SR 92) crosses through the Watershed between Upper and Lower Crystal Springs Reservoir. There are several internal maintenance and fire roads within the Watershed. Some of these roads come together in the northern portion of the Watershed near Mud Dam at a site known as Five Points.

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. As a result, the Peninsula Watershed lands have the greatest concentration of special status-species in the nine-county Bay Area.

4.0 HISTORY OF MANAGEMENT PLAN DEVELOPMENT

The Watershed management planning process commenced in August 1992. 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. 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 Management Plan development and review. The goals, described in detail in Section II.B, were used by the planning team throughout the planning process to provide direction for development of the alternatives. The goals serve as a foundation for the policies and management actions and would also serve as a basis for ongoing evaluation of Management Plan implementation.

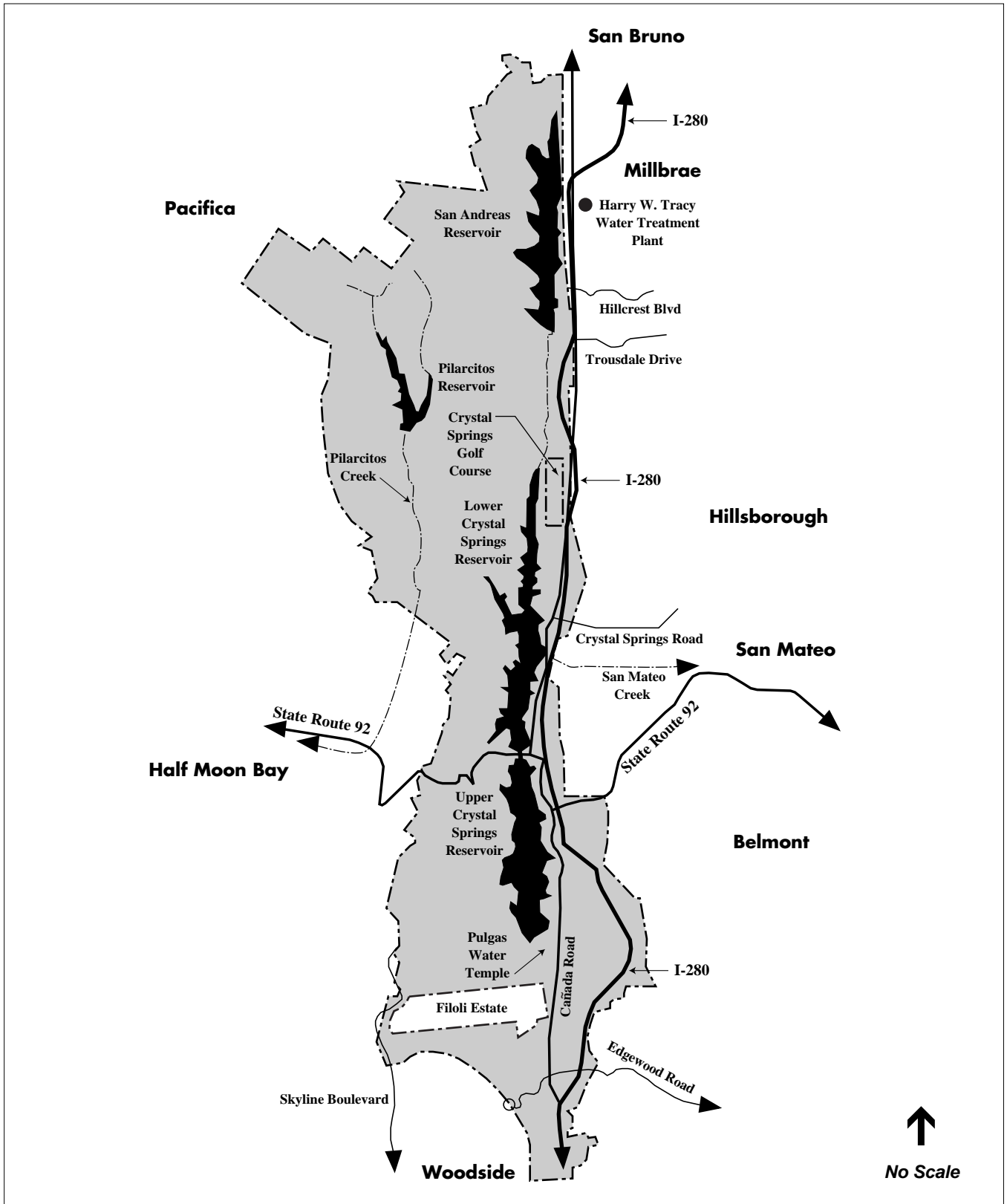
Information on Watershed water quality, natural resources, cultural resources, and wildfire severity was mapped using a Geographic Information System (GIS). Each resource type was entered into the SFPUC GIS and became a separate map (or layer). Selected layers were then "sandwiched" together to provide information-rich composite maps, from which a set of resource



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

Peninsula Watershed Management Plan EIR / 930385 ■

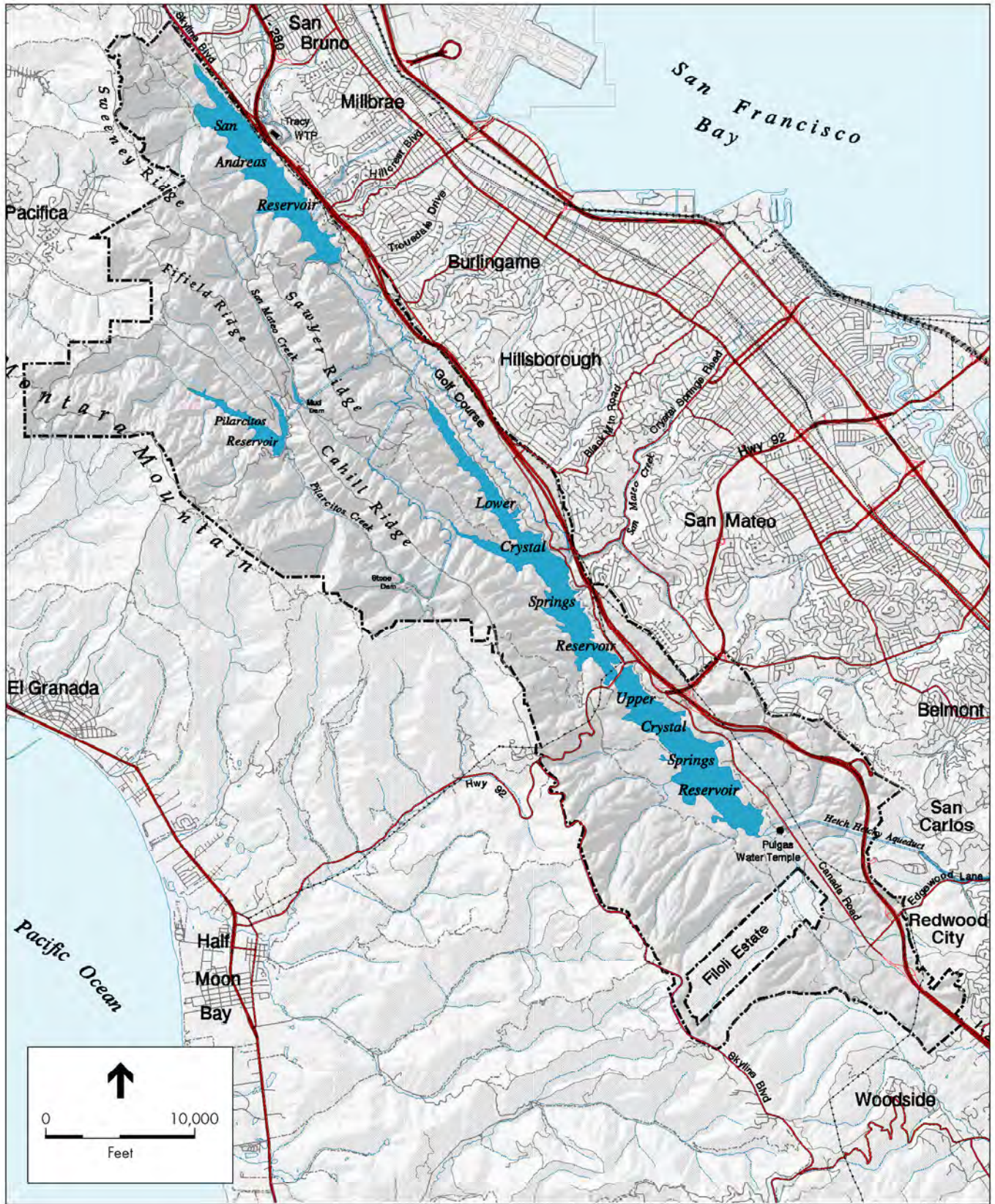
Figure II-2
Project Location



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

Peninsula Watershed Management Plan EIR / 930385 ■

Figure II-3
Peninsula Watershed,
Schematic Base



SOURCE: EDAW Inc. 1999, Environmental Science Associates.

Peninsula Watershed Management Plan / 930385 ■

Figure II-4
 Peninsula Watershed
 Topographic Base

- vulnerability/sensitivity maps was created for the Watershed. Together, these maps, which show Ecological Sensitivity Zones (ESZ), are referred to as the Peninsula Watershed Tool Kit, and they define areas of the Watershed where resources are most sensitive to disturbance.

These maps were considered together with public comments and public survey results to form three Watershed management alternatives. The three alternatives provided varying degrees of water quality improvement as well as ecological resource protection, increased public access and use, and other activities. Alternative A provides the highest improvement in water quality and emphasizes ecological resource protection and enhancement. Public access would be very limited under Alternative A. Alternative B provides a moderate improvement in water quality and a balance between ecological resource protection and public access and other activities. Alternative C provides only a slight improvement in water quality and greatly emphasizes increased public access. Alternative C includes an extensive trail system and a new golf course. The alternatives are further described in Chapter IX, Alternatives. The alternatives were also presented at public, agency, and staff workshops.

The preferred alternative was derived following evaluation of all three alternatives and combines Alternative B with some components of Alternative A. The preferred alternative provides for better-than-moderate improvement in water quality and balances ecological resource protection with water supply needs, public access, and Watershed activities. The preferred alternative, as it was approved in January 1995, applied to both the Peninsula and Alameda Watersheds. Subsequent amendments to the *Peninsula Watershed Management Plan* include the *Southern Peninsula Watershed Golf Course* (March 1997) and the *Fifield/Cahill Ridge Trail Element* (June 1997).

Extensive discussion regarding the *Southern Peninsula Watershed Golf Course Element* took place at two regular monthly meetings of the SFPUC, and changes to the preferred alternative came about as a result of public comment directed to SFPUC commissioners and the San Francisco Board of Supervisors. However, it is assumed that the SFPUC will rescind these changes based on the recent resolution adopted by the San Francisco Board of Supervisors that prohibits a new golf course, discussed below in Section II.B.2.2.

The *Fifield/Cahill Ridge Trail Element* came about as a result of public comment from several groups and agencies with an interest in the trail project directed to SFPUC commissioners and the San Francisco Board of Supervisors. The Bay Area Ridge Trail Council (BARTC) is a membership organization spearheading development of a regional ridge trail and inclusion of the Fifield/Cahill service road as part of this trail. The Golden Gate National Recreation Area (GGNRA) is the administrative agency for National Park Service land that is adjacent to the Watershed. GGNRA is also the administrator of the terms of a Scenic Easement and Scenic and Recreation Easement under 1980 legislation, which transferred such administration to GGNRA from the U.S. Department of the Interior's Bureau of Outdoor Recreation (see Section III.A, Existing Plans and Policies).

On April 21, 1997, the San Francisco Board of Supervisors passed a resolution calling for public recreational access to the Peninsula Watershed along a more interior route – the Fifield/Cahill

Ridge service road, which runs along the ridge through most of the northern portion of the Watershed. The resolution endorsed the service road as a segment of the Bay Area Ridge Trail. The proposed Fifield/Cahill Ridge Trail would connect with the existing GGNRA's Sweeny Ridge Trail at the northern end of the Watershed, thus providing a connection to portions of the Bay Area Ridge Trail. In response to the Board's resolution, City staff had discussions with representatives of BARTC, GGNRA, the California Department of Fish and Game (CDFG), and the U.S. Fish and Wildlife Service (USFWS) concerning impacts that could occur with development of this trail. The CDFG and USFWS suggested the preparation of an EIR for this segment of the Bay Area Ridge Trail due to Endangered Species Act concerns. These discussions resulted in proposals for varying degrees of recreational use of the Fifield/Cahill service road. Detailed project descriptions of these alternatives are presented in Chapter V and are analyzed at a project-level in this EIR. A project-level analysis is provided to enable decision-makers to give full project approval or disapproval. This analysis differs from the program-level analysis provided in the bulk of this EIR, in that projects analyzed at a program-level may require additional environmental review once further details of these projects are known prior to their construction and/or implementation. South of Highway 92, the Fifield/Cahill Ridge Trail would connect with a trail along Skyline Boulevard extending south to Kings Mountain. This trail, known as Alternative A/B, is addressed programmatically in this EIR and described as management Action tra2 in the Management Plan.

B. MANAGEMENT PLAN SUMMARY

1.0 MANAGEMENT PLAN OVERVIEW

The *Peninsula Watershed Management Plan* is presented in six chapters. An Introduction (Chapter 1.0) is followed by a discussion of Existing Conditions and Resource Sensitivity (Chapter 2.0). Chapter 3.0 briefly describes the major Watershed Management Issues. Chapter 4.0 describes Watershed Management Goals and Policies for each of the major management issue areas established in Chapter 3.0. Chapter 5.0 presents the actions and guidelines that form the basis of the *Peninsula Watershed Management Plan*. This crucial chapter is followed by a discussion of Phasing and Implementation (Chapter 6.0).

2.0 MANAGEMENT PLAN GOALS AND POLICIES

Watershed Management Goals and Policies (identified in Chapter 4.0 of the Management Plan) provide the foundation for the actions and guidelines that will shape SFPUC's future management of Watershed lands. The goals were articulated during the planning process, and the policies were designed to guide ongoing decision-making by the SFPUC and other responsible parties. The Watershed Management Goals include a primary goal and the six secondary, supporting goals and are listed below.

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 Watershed, 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 policies of the Management Plan are organized into 11 major topic areas. These topics are listed below and are discussed in further detail in Chapter 4.0 of the Management Plan.

- Water Quality
- Water Supply
- Vegetation
- Wildlife
- Aquatic Resources
- Cultural Resources
- Fire
- Safety and Security
- Watershed Activities
- Public Awareness
- Administrative and Finance

2.1 PRIMARY GOAL AND POLICIES

Maintain and Improve Source Water Quality to Protect Public Health and Safety

Policies focused on water quality and designed to support the primary goal are organized into seven subtopics. These subtopics are shown in bold in the discussion below.

Physical, chemical, and biological considerations are addressed in Water Quality Policies WQ1 through WQ8, which include policies that would prevent the introduction of pesticides and chemicals into the water supply by controlling their use. The policies call for implementing alternative methods of pest control where possible, restricting aerial broadcast of chemical pesticides, and controlling the use and transport of other hazardous chemicals. Policies in this subtopic would protect the water supply by preventing the introduction of a variety of pollutants such as nutrients, disinfection by-products, leaching metals, asbestos fibers, pathogens, and petroleum products in runoff from nearby roads.

With regard to **roads, trails, and rights-of-way**, Policies WQ9 through WQ13.1 concentrate on limiting the construction of new points of access onto the Watershed and on controlling Watershed roadway use. Where new roads or trails are required, policies call for design that would avoid stream crossings and prevent increased erosion and runoff.

Policies WQ14 through WQ17 prohibit land uses and activities that have the potential to cause **erosion, sediment generation, and increased runoff**. Specific policies of this subtopic call for controlling runoff and contaminants in runoff through minimizing generation of vehicle-related contaminants, limiting the creation of impervious surfaces, and the use of sedimentation basins.

Policies WQ18 through WQ24 within this subtopic describe **coordination, collaboration, and land management** procedures that would protect water quality. These range from restrictions on construction and development (including water treatment facilities) within Watershed lands to prescriptions for participation and coordination with local and regional governing agencies. This subtopic also describes policies that would protect Watershed resources both by new land acquisition within the greater hydrologic watershed and by prohibition of the sale or exchange of SFPUC-owned Watershed lands that are critical to water quality, supply, and SFPUC operations.

Policies WQ25 and WQ26 call for the protection of **wetlands, riparian areas, and stream channels**. These policies also prohibit unauthorized fill or excavation activities in these areas.

Policies WQ27 through WQ29 address **access restrictions and enforcement** with regard to water quality. These policies call for strictly controlling public access to minimize adverse effects to water quality. More specifically, they prohibit swimming, boating, and windsurfing and other body-contact activities in all waterbodies. The final policy in this subtopic describes the active enforcement of penalties and other standard procedures with respect to activities that could adversely affect water quality.

Policies WQ30 and WQ31 call for intensive management and ongoing **monitoring** of land uses and activities that could introduce pathogens into the water supply. Specific policies call for ongoing monitoring of reservoirs and tributaries to record water quality conditions as related to Watershed activities.

2.2 SECONDARY GOALS AND POLICIES

The secondary goals of the Management Plan are summarized below using the 11 policy topic areas set forth in the Management Plan.

Maximize Water Supply

From this secondary goal, water supply policies have been developed that focus on a number of objectives. These include maximizing reservoir storage by minimizing sedimentation, minimizing water use within the Watershed through conservation and reclamation (Policies WS2 and WS3), and enhancing and protecting the water supply and yield of the Watershed (Policies WS4 through WS6). Finally, Policy WS7 calls for minimizing the release of water that cannot be recaptured.

Preserve and Enhance the Ecological and Cultural Resources of the Watershed

Vegetation. Vegetation Policy V1 addresses vegetation management, referencing the City and County of San Francisco's City Pesticide Management Plan Ordinance, which requires an Integrated Pest Management Program. In keeping with this ordinance, Policy V2 focuses on reducing chemical use. Policies V3 and V4 call for the control and eradication of invasive plant species (exotics) and noxious weeds and place prohibitions on planting exotic species. Policies V5 and V6 allow for protection of special-status plant communities. Policies V7 through V14 give guidance and direction regarding the management and protection of special vegetative communities or habitats. Policy V15 notes the requirement of a site-specific environmental analysis for individual proposed facilities and/or infrastructure projects, as prescribed by applicable state and federal law.

Wildlife. Wildlife Policies W1 through W6 focus on the protection and enhancement of Watershed wildlife resources and habitats. These policies include protection of habitat as well as the actual wildlife populations within the Watershed. Policy W3 specifically addresses the preservation of the biodiversity and genetic integrity of local wildlife populations. Policy W7 addresses the eradication of pest species, including harmful, feral, or introduced animals. Policy W8 restricts access to ecologically sensitive zones to minimize human disturbance. Policies W9 and W10 give specific requirements regarding future project impact assessments, particularly with regard to wildlife resources. Policy W11 discusses the need to achieve appropriate compliance with relevant regulations that affect protected species. Policies W12 and W13 encourage wildlife studies and effective monitoring of wildlife management policies.

Aquatic Resources. Aquatic Resources Policies AR1 through AR4 address the protection and enhancement of aquatic resources and habitat through adherence to applicable regulations and broad guidance regarding conservation of biodiversity and control of exotic aquatic species. Policy AR5 calls for minimizing and, where possible, eliminating introduction of chemicals into streams and reservoirs. Policy AR6 prohibits artificial stocking or other introduction of non-native fish into Watershed aquatic habitats. Policy AR7 specifies requirements for future project impact assessments, particularly with regard to aquatic resources. Policies AR8 and AR9 describe management strategies for coordination with local, regional, and state agencies and other organizations. Policy AR10 prohibits some land uses and/or classes of activities within high water-quality vulnerability zones. Policy AR11 promotes the use of wetland mitigation banking to offset any impacts that could occur from SFPUC activities.

Cultural Resources. Cultural Resources Policies in this subtopic address cultural resource management. Policies CR1 through CR4 address preservation and protection of cultural resources (including submerged cultural resources), particularly those eligible for listing or listed on the National Register of Historic Places or the California Register of Historic Places. Policies CR5 through CR7 call for coordination and consultation with Native American organizations regarding cultural resources. Policy CR8 encourages the evaluation and monitoring of known cultural resource sites. Finally, Policy CR9 gives specific requirements regarding future project impact assessments, particularly with regard to cultural resources.

Protect the Watersheds, Adjacent Urban Areas, and the Public from Fire and Other Safety Hazards

Fire. Because the Watershed is near populated urban areas, an accumulation of fuels can pose a risk to public safety due to the potential for wildfires. A wildfire could also affect water quality, water supply, and ecological and cultural resources within the Watershed and in adjacent areas. Fire Policies F1 through F10 address the protection of Watershed resources in terms of fire prevention, including restricting access as a fire suppression tool. However, Watershed Management Plan Policies F11 through F14 also address the use of prescribed fire for vegetation management and enhancement.

Safety and Security. Safety and Security Policies S1 through S3 address safety concerns resulting from public exposure to risks during recreational activities. Policies S4 through S8 concentrate on minimizing particular risks from hazardous seismic and geologic conditions and from hazardous materials. Policies S9 through S11 address the role of SFPUC staff as both a security force and an emergency response team. The management of liability is addressed in Policies S12 through S14.

Continue Existing Compatible Uses and Provide Opportunities for Potential Compatible Uses on Watershed Lands, Including Educational, Recreational, and Scientific Uses

Prohibitions and Restrictions on New Activities/Development. Watershed Activities Policy WA1 lists specific activities that would be prohibited because they are deemed detrimental to Watershed resources. These prohibited activities include:

- unauthorized take or possession of wildlife (including fish);
- unauthorized take of vegetation;
- swimming and body contact with the water;
- walking of domestic pets;
- boating, with the exception of authorized personnel;
- activities that result in direct public access to reservoirs and tributaries;
- smoking, campfires, and fireworks;
- dumping and littering;
- use of motorized vehicles, with the exception of authorized personnel;
- use of septic systems on SFPUC lands;
- use of the Watershed during periods of extreme fire weather conditions;
- hunting;
- use or possession of alcoholic beverages;
- unauthorized feeding of animals;
- use of firearms and bows and arrows;
- fishing;
- mobile vendor activities;
- unsupervised public access to existing internal roads/fire roads and trails (with the exception to Fifield/Cahill Ridge Trail, as described elsewhere in the Management Plan);
- camping;
- off-trail use by recreational users;
- unauthorized construction of new trails;

- mountain biking, except on specifically designated trails;
- equestrian use, except on specifically designated trails;
- new golf courses; and
- expansion of the existing golf course.

Policies WA2 through WA9 prohibit or limit the location or conditions of a variety of construction and development projects on the Watershed, including pipelines, instream mining, new utility lines and communication facilities, new waste disposal systems, and private concession sales.

Activities Allowed by Permit. Policy WA10 lists activities that would be allowed in the Watershed by SFPUC permit only. These permits would be issued primarily for day use or one occurrence and could include the following:

- overnight use;
- off-trail activities;
- off-road vehicle use;
- blasting of explosives;
- open fires;
- trapping and release of introduced fish and wildlife;
- collection of plant or animal specimens;
- use of Pulgas Water Temple;
- collection of state game or state protection fishery resources;
- collection of federally regulated or protected fish species;
- supervised public access to existing internal roads/fire roads and trails;
- research/scientific study by non-SFPUC personnel;
- educational activities;
- hunting for control of pest species and feral animals; and
- removal of vegetation, including timber harvest and/or salvage.

Most of the activities allowed by permit are related to special activities such as scientific research and education (as demonstrated in Policies WA11 and WA12).

Recreational Access. Policies WA13 through WA18 concentrate on the conditions for recreational access on the Watershed. Policy WA13 requires that proposed recreation activities be compatible with their landscape setting, not adversely affect Watershed resources, and comply with the goals and policies of the Management Plan. Policy WA14 requires that new recreation and public access activities be resource-based, outdoor recreation or educational activities where possible. Resource-based recreation includes uses that are dependent upon the natural, scenic, and/or cultural resources present, but that do not adversely affect those resources upon which they depend. For the Peninsula Watershed such uses include hiking, nature study, wildlife viewing, sightseeing, and visiting educational centers. Policy WA15 limits, where possible, open public access to recreational trails to the periphery of the Watershed in order 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 provides for continuing use of existing public trails without a permit, except where a permit is currently required. Policy WA15.2 provides for consideration of new trails in zones of lesser vulnerability and risk, where consistent with the goals and policies of the

Management Plan. Policy WA15.3 provides for retention of existing public trails and the activities allowed upon them. The most active trail use would be encouraged upon these trails. Policy WA15.4 provides support for new trail connections that link to adjacent communities and to the trail facilities of other agencies and that help to complete a continuous north-south public trail along the eastern edge of the Watershed. Policy WA16 would require that all individuals allowed entrance into the Watershed, either by permit or open access, be informed of the Watershed's primary purpose and the rules and regulations governing Watershed activities. Policy WA17 would require that all individuals and groups granted permits to Watershed lands 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 would require management of a volunteer docent program to accommodate supervised access to the Watershed.

Review Process for Proposed Plans and Projects. Policies WA19 through WA21 provide a review procedure for assessing future projects. Policies WA22 through WA31 describe criteria that new facilities, projects, activities, and development must meet. To ensure all future land management decisions and uses remain consistent with the goals and policies set forth in the Management Plan, Policy WA19 specifies that proposed plans and projects on the Watershed be reviewed according to the process illustrated in Figure 4-1 of the Management Plan. All proposed plans and projects must be analyzed for compliance with the goals and policies of the 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 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 specifies that should the SFPUC determine that a proposed plan/project would not comply with the Watershed goals and policies, LRMS staff shall make appropriate comments so that the applicant may bring the proposed plan/project into compliance with the Management Plan. Policy WA21 requires that all costs associated with reviewing, analyzing, and making decisions related to future plans and projects proposed on the Watershed be borne by the plan/project applicant.

SFPUC Operations and Maintenance Activities. Policies WA32 and WA33 provide procedural guidelines for SFPUC staff regarding everyday activities. Policies WA34 and WA35 address evaluation and coordination of ongoing projects.

Southern Peninsula Watershed Golf Course. Policy WA36 prohibits new golf course development at any location in the Peninsula Watershed. A new golf course was first considered as a potential use on the southern Watershed in 1968 as part of studies completed for the establishment of the Scenic and Recreation Easement. The 1969 Scenic and Recreation Easement conceptually permitted the construction of a new golf course on the southern Peninsula Watershed site. Since that time, new golf courses have been proposed in several locations on the southern Watershed and have met with significant opposition from the environmental community. In June 1999, San Francisco Mayor Willie Lewis Brown, Jr. signed a resolution adopted by the San Francisco Board of Supervisors prohibiting inclusion of a new golf course on

the Peninsula Watershed. This resolution notes that the 1995 *Draft Peninsula Watershed Management Plan* (Preferred Alternative, January 1995) prohibited the construction of a new golf course but that political pressure resulted in consideration of a new course in the 1998 Management Plan. The resolution further details the unique ecological resources that exist in the Watershed and directs the SFPUC to remove the proposed construction of a new golf course from the Management Plan. Given this most recent action, this EIR will not consider a Southern Peninsula Watershed Golf Course as part of the analyzed Management Plan.

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

The Management Plan includes several policies relating to administration and finance policies. However, according to CEQA Guidelines Section 15131, analysis of these policies is outside the scope of this EIR. However, it is worth noting that Policy AF7 states that “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.” Further, Policy AF7.1 specifies that water system ratepayer would not fund the cost of providing recreational facilities and docents. In addition, the SFPUC water system ratepayers would not fund the implementation of mitigation measures needed to reduce the impacts of increased public access, as proposed in the Management Plan.

Enhance Public Awareness of Water Quality, Water Supply, Conservation, and Watershed Protection Issues

The Management Plan addresses opportunities for public awareness and education in Public Awareness and Agency Participation Policies PA1 through PA5. These policies encourage public education and specify a number of types of awareness programs. Policy PA6 calls for encouraging agencies with overlapping jurisdictions to adopt similar regulations and guidelines. Policies PA7 through PA9 provide management guidelines for including public agencies/groups in Watershed monitoring and investigations.

3.0 MANAGEMENT PLAN ACTIONS AND GUIDELINES

Based on the goals and policies described above, Chapter 5.0 of the *Peninsula Watershed Management Plan* presents management actions and guidelines that are designed to implement the goals and policies. The management actions are intended to guide staff in the day-to-day activities required to manage the Watershed. The guidelines provide additional direction and clarification for selected management actions, which are designed for implementation over the 20 years following Management Plan adoption. Management actions are organized by management action topics (e.g., roads, stormwater, vegetation) within the Watershed. 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.

The management actions for each of these management action topics are broadly discussed below, and each management action is summarized in Table II-1 (located at the end of this chapter), which is organized by management action topic.

The Management Plan was designed to improve the SFPUC's ability to protect its overall Watershed in general, and in particular the specific resources that make up the Watershed. Given the intention behind the Management Plan design, the overall environmental impacts of the Management Plan are beneficial. However, some of the actions also have the potential to cause physical impacts on the environment. These management actions are described in Table II-1 (at the end of this chapter). The analysis of these actions forms the core of this EIR.

The analysis of potential impacts (in subsequent chapters of this EIR) examines those 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. In most cases additional management actions were designed to reduce such impacts. These cases are noted in the analysis of potential impacts in this EIR.

Stormwater actions are designed to manage, monitor, and improve, where necessary, stormwater drainage facilities.

Hazardous Materials and Contamination actions address the proper use and storage of hazardous materials at SFPUC facilities; procedures for spill protection, containment, and response; and measures to convey the requirements for spill containment and response to other agencies and private companies conducting activities on the Watershed.

Waste – Human and Animal actions include inspection procedures for SFPUC, lessee, and non-SFPUC facilities; development of surveys to assess the impacts of wildlife excrement on water quality; and coordination with other agencies and private companies conducting activities on the Watershed regarding water quality risks associated with human and animal waste.

Roads actions include assessing the existing road network and developing management techniques to reduce erosion, ongoing inspection of the road network for needed repairs, and requirements for new roads.

Conservation and Reclamation of Water actions include evaluating and improving the efficiency of landscaping and irrigation practices; implementing, wherever possible, the use of raw, untreated, or reclaimed water; and methods to manage vegetation to increase the water supply.

Fire Management actions include equipment requirements to prevent and control accidental fires; installation of fire defense improvements, including hydrants, helispots, and road improvements; specific fuel management projects designed to reduce fire risk; fire response procedures; and establishment of an ongoing monitoring program.

Safety and Security actions include the development of law enforcement procedures, development of a safety and security program that includes periodic inspection and maintenance of facilities, development of an emergency response plan and practice drills, daily reservoir patrols, preparation of a Watershed manual, and coordination with adjacent agencies and lessees regarding enforcement and emergency response.

Vegetation and Soil Management actions include development of Vegetation Management Plan, procedures to follow prior to conducting new activities that may impact vegetation, restoration of disturbed areas, removal of exotic species, development of forest management prescriptions, soils management requirements, integrated pest management activities, and coordination with other parties regarding vegetation management activities.

Wildlife actions include procedures to follow prior to conducting new activities that may impact wildlife; protection of wildlife movement corridors and habitat; preparation of a Habitat Conservation Plan; prohibition of activities during breeding periods of sensitive rare, threatened, and endangered species; and identification of desirable future studies and monitoring activities.

Aquatic Zone Protection and Fisheries actions include procedures to follow prior to conducting new activities that may impact the aquatic zone or fisheries; measures to protect wetlands and reservoir shorelines, stream channels, and banks; methods to encourage fish migration; development of a sedimentation basin management program; and ongoing monitoring of the sediment levels in the reservoirs.

Cultural Resources actions include procedures to follow prior to conducting new activities that may impact cultural resources, methods for protecting existing resources, and a monitoring program to ensure protection of significant cultural resources.

- **Environmental Compliance** actions include assigning a staff member to assume environmental compliance responsibilities, assessing the impacts of proposed activities, and incorporating the EIR mitigation measures into the Final Plan.

Lease and Permit Requirements actions include development of a scientific, educational, and agency permit reservation system; development of a public-access permit reservation system; and establishment of new lease and permit requirements in keeping with the goals and policies of the Management Plan.

Public and Agency Outreach actions include development of a public education program; development of public outreach facilities and information; establishment of a docent program; and ongoing collaboration efforts with agencies, educational institutions, and nonprofit groups to develop and disseminate educational programs and materials.

Staffing and Training actions include development of staff responsibilities, assignment of staff to specific duties, enforcement procedures training, Watershed resource and Management Plan training, and fire management and emergency response training.

Fiscal Framework actions include methods to evaluate costs and benefits of Watershed activities, establishment of lease and permit fees, assignment of adequate Watershed management funding, identification of alternative funding sources, procedures for identifying lands for acquisition, and establishment of fines for lease violations.

Information Management actions include establishment of a Watershed Visitor Education Center, requirements for ongoing management of the GIS database, and Watershed web page maintenance.

Design and Construction Requirements actions include development and use of a review process for proposed plans and projects to assure compatibility with Management Plan goals and policies; construction fencing requirements, design guidelines for new structures, and requirements for universal access.

Southern Peninsula Watershed Golf Course actions related to golf course development have been eliminated from the Management Plan. As noted in Section 2.2, above, the San Francisco Supervisors adopted a resolution prohibiting inclusion of a new golf course in the Management Plan. In addition, the Management Plan does not include actions for expansion of the existing golf course.

Fifield/Cahill Ridge Trail actions define each trail alternative and its operations and management for the Fifield/Cahill Ridge Trail and the Southern Skyline Boulevard trail alignment. A project description of the Fifield/Cahill Ridge Trail is presented in Chapter V of this document.

4.0 PHASING AND IMPLEMENTATION

The *Peninsula Watershed Management Plan* would be implemented over a 20-year period following its adoption. The intention of the SFPUC is to review and update the Management Plan periodically, as needed, with a complete review and update required at the end of the 20-year period. The goals and policies, as well as the management actions, are intended to be updated and revised as necessary. Within the Management Plan, management action phases are identified by one or more of the following categories:

- (1) within 5 years of Management Plan adoption;
- (2) within 10 years of Management Plan adoption;
- (3) within 20 years of Management Plan adoption;
- (A) on an as-needed basis; and
- (B) at regular intervals throughout the life of the Management Plan.

Some management actions have been assigned two phasing types. Usually these are actions that require implementation in the near future (Phase 1) and then require updating, either as necessary or at regular intervals. Some management actions are ranked solely as (A) and are generally intended to be conducted prior to any new construction activities within or adjacent to the Watershed.

In general, phasing priorities are related to the ability of an action to help achieve the Management Plan's primary goal – maintaining and improving source water quality. Actions that are most critical to meeting this goal are assigned to Phase 1. Phase 2 actions are also integral to maintaining and improving water quality but may have a less far-reaching effect. Phase 3 tasks would either achieve other Watershed management goals or are actions that are not likely to occur for at least 10 years. Table II-1 indicates the phasing priority assigned to each of the management actions.

C. RELATED PROJECTS AND STUDIES

Other projects the SFPUC is participating in include the preparation of an overall Water Supply Master Plan that will address water supply and storage for the entire system and will result in projects that will undergo separate environmental review. In addition, the SFPUC is undertaking the following projects (either planned or underway) on the Peninsula Watershed. These projects are listed below and are discussed further in Section III.P of this EIR.

- Minor upgrades, ongoing improvements/repairs, and additions/alterations to existing structures
- Crystal Springs Pump Station and Pipeline
- Lower Crystal Springs Dam Abutment Project
- Automation of Operations
- Hetch Hetchy Water Treatment Project – Chloramine Conversion
- Pulgas Interim Dechlorination Facility Project
- CCWD Half Moon Bay meter pipeline replacement

In addition, other agencies and entities have proposed projects in the immediate vicinity of the Watershed, including:

- Highway 92 widening project
- San Mateo County recreational trails expansion
- Skylawn Cemetery mortuary/chapel building project

D. APPROACH AND ORGANIZATION OF THE EIR

The *Peninsula 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, a broad range of policies and management actions. In this way, decision-makers and the public can get a sense of the overall physical effects of the whole Management Plan. The responsibility of the Program EIR is to focus attention to those aspects of a future project (often a long-range plan) that could bring about adverse physical impacts. A Program EIR in this way serves as a foundation for subsequent environmental documentation and/or clearance. CEQA Guidelines Section 15146 indicates that "the degree of

specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR....”

The Program EIR identifies and analyzes the potential environmental impacts of the program-wide policies and management actions presented in the Management Plan, and proposes mitigation measures that would reduce those impacts determined to be significant. With the Program EIR, the SFPUC and the public will be able to consider the Management Plan in its entirety and the impacts of associated with policies and management actions in the Management Plan, some of which might be overlooked if considered on a case-by-case basis. The Program EIR also allows for consideration of broad policy alternatives and their possible environmental effects in a more exhaustive manner than would otherwise be possible. Optimally, this process allows for development of program-wide mitigation measures at a stage when the agency has greater flexibility to deal with basic problems or cumulative environmental impacts, and provides an opportunity to reduce paperwork. Program-level analysis differs from project-level analysis, which benefits from detailed, specific plans of a project (i.e., grading, footprint) and usually applies more directly to actual construction.

This Program EIR calls out specific management actions or policies that would probably require further project-level environmental analysis, such as new trails other than the proposed Fifield/Cahill Ridge Trail. In addition, some SFPUC activities that require approval from other agencies may be subject to subsequent CEQA review. Table II-1 indicates those management actions that could require further environmental analysis. In addition, if new information becomes known prior to implementation of an action that could lead to significant impacts, such as project location, further environmental analysis would be required.

One element of the Management Plan, the proposed Fifield/Cahill Ridge Trail project, is reviewed at a project-level in this report. The San Francisco Board of Supervisors directed the SFPUC to provide specific analysis and mitigation so that decisions regarding this project could be made as quickly as possible. If new information becomes known about this project prior to implementation that could lead to significant impacts, such as a change in the project description, further environmental analysis would be required. South of Highway 92, the Fifield/Cahill Ridge Trail would connect with a trail along Skyline Boulevard extending south to Kings Mountain. This trail, known as Alternative A/B, is addressed programmatically in this EIR.

Chapter III of this EIR presents the environmental setting for the Watershed areas and an analysis of the potential program-level impacts. Environmental impacts of implementing the Management Plan are measured against existing conditions. Chapter IV presents program-level mitigation measures that would reduce the potential impacts of the Management Plan. Chapter V presents a project description and project-level analysis of the potential impacts of the Fifield/Cahill Ridge Trail project. Chapter VI presents project-level mitigation measures that would reduce the potential impacts of the Fifield/Cahill Ridge Trail project. Chapter IX presents a comparison of the impacts of the alternatives described in Section II.A.4.0.

E. ENVIRONMENTAL REVIEW PROCESS

CEQA requires that the Management Plan be evaluated for potential environmental impacts. Chapter III of this EIR evaluates the potential environmental impacts of Management Plan implementation at a program-level of detail. Under the San Francisco Administrative Code, Chapter 31, the Major Environmental Analysis (MEA) section of the San Francisco Planning Department is responsible for implementing CEQA review of all City and County of San Francisco projects. The Planning Department is the lead agency for this EIR, and the project sponsor is the SFPUC.

MEA determined that an EIR must be prepared for the proposed project prior to any final decision regarding whether or not to approve the project. A Notice of Preparation was issued in 1996 noting that all CEQA checklist items will be addressed in the EIR. A subsequent notice was issued in 1998 to describe changes that had been made in the preferred alternative since 1996.

The EIR is a public informational document for use by responsible government agencies and the public to identify and evaluate the potential physical environmental consequences of the Management Plan, to present mitigation measures to reduce or avoid potential environmental impacts, and to examine feasible alternatives to the proposed project. Preparation of an EIR does not indicate a decision by the City to approve or disapprove a project. However, prior to making any such decision, the decision-makers must review and consider the information in the EIR.

1.0 NOTICE OF PREPARATION

As described above, in accordance with Sections 15063 and 15082 of the CEQA Guidelines, MEA prepared a Notice of Preparation (NOP) for this EIR. The original NOP was circulated to local, state, and federal agencies and other interested parties for 30 days, beginning on October 18, 1996. The NOP provided a description of the Management Plan, the Watershed location, and a preliminary list of potential environmental impacts.

In early 1998, as has been discussed, SFPUC made changes in the preferred alternatives regarding the grazing plan (Alameda Watershed), the Southern Peninsula Watershed Golf Course (Peninsula Watershed), and the Bay Area Ridge Trail alignment (Peninsula Watershed). Given these changes, a second NOP was issued in August 1998 (presented in Appendix IX.A) to inform the public of a changed project description and subsequent delay required for the analysis of these changes.

2.0 SCOPING

A scoping meeting was held in San Mateo County on November 7, 1996. In this meeting, MEA staff presented the Management Plan and solicited preliminary comments from the public. Public comments regarding the NOP were also received by MEA in the 30 days following NOP issuance in October 1996 and revised NOP issuance in August 1998.

3.0 DRAFT EIR

- The Draft EIR contains a description of the Management Plan, description of the environmental setting, identification of potential program-level impacts, potential project-level impacts associated with the proposed Fifield/Cahill Ridge Trail project, mitigation measures for impacts found to be significant, and an analysis of project alternatives. Significance criteria were developed for each environmental issue analyzed in this EIR and are defined at the beginning of each impact analysis section.

4.0 PUBLIC REVIEW OF DRAFT EIR AND PREPARATION OF THE FINAL EIR

- This Draft EIR underwent a 45-day public review period, including two public hearings, one in San Francisco and another in San Mateo County, during which comments on the accuracy and completeness of the information presented were accepted. Following the public review period, responses to written and oral comments received from the public and agencies were prepared. The Draft EIR was revised accordingly, and the Final EIR was distributed to all commenters and those requesting a copy. The San Francisco Planning Commission certified the Final EIR as adequate under CEQA, and considers the EIR accurate, objective, and complete. The Final EIR serves as the program-level environmental review document for the entire *Peninsula Watershed Management Plan*, except for the Fifield/Cahill Ridge Trail, for which it serves as the project-level environmental document. Subsequent project proposals may require further environmental analysis under CEQA, as indicated in this document (see Table II-1). If the Management Plan is approved, the SFPUC would reserve the right to implement Management Plan management actions and any associated mitigation measures identified in the EIR at its discretion, as funding and other resources allow.

5.0 MITIGATION MONITORING AND REPORTING

- Section 21081.6 of the Public Resources Code requires lead agencies to adopt a reporting and mitigation monitoring program for changes to a project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. Mitigation measures that reduce significant impacts of implementing the *Peninsula Watershed Management Plan* could be adopted by the SFPUC as conditions of Management Plan approval. Mitigation measures adopted would be included in a Mitigation Monitoring and Reporting Program. The purpose of this program is to ensure implementation of the mitigation measures. The SFPUC will be responsible for implementing the Mitigation Monitoring and Reporting Program.

After the Management Plan is adopted, SFPUC would implement the Management Plan. Day-to-day management activities under the Management Plan are covered in this EIR and would generally not require examination to determine if further CEQA environmental review is required. Specific construction projects or actions pursuant to the Management Plan shown in Table II-1 of this EIR as not requiring project-specific environmental review generally would also

not be subject to examination to determine if further CEQA review is required. Specific construction projects or actions pursuant to the Management Plan shown in Table II-1 of this EIR as possibly requiring project-specific environmental review would be examined by the SFPUC and the San Francisco Planning Department Major Environmental Analysis section to determine whether the proposal includes (1) the appropriate combination of actions to mitigate significant impacts, as identified in the various “Management Actions that Could Result in Significant Physical Effects” tables in Chapter III, Environmental Setting and Impacts, and/or (2) the appropriate mitigation measures listed in Chapter IV of this EIR or others that may be adopted by the SFPUC as part of their Management Plan adoption actions. If such examination indicates the potential for any significant effects not described in this EIR, further CEQA environmental review would be necessary at a project-level of detail.

**TABLE II-1
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number¹	Summary of Management Actions²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review³
<u>Stormwater (sto)</u>				
sto1	Assess on-site stormwater collection and drainage systems for adequate sizing and erosion. Remediate where necessary. (Phase 2A)	Yes	Yes	Yes
sto2	Field verify on a biannual basis that stormwater runoff from I-280 is exported out of the Watershed. (Phase 1B)	No	No	No
sto3	As part of the Caltrans Highway 92 widening project, ensure that a stormwater collection and filtration system is included. (Phase 1)	No	No	No
sto4	Upon completion of the Caltrans Highway 92 widening project, periodically field verify that stormwater runoff is adequately collected and filtered. (Phase A)	No	No	No
<u>Hazardous Materials and Contaminants (haz)</u>				
haz1	Develop hazardous chemical management procedures addressing the type, use, storage, and disposal of hazardous chemicals used in Watershed activities. (Phase 1)	No	No	No
haz2	Inventory and annually monitor all above- and below-ground fuel storage tanks , refueling stations, and vehicle maintenance yards. (Phase 2B)	No	No	No
haz3	Identify and prioritize for removal from SFPUC lands, dump sites that pose a hazard to water quality and Watershed resources. (Phase 2)	No	No	Yes
haz4	Identify key locations for, and install barriers or fencing to prevent, access to reservoir edges and dams. (Phase 1)	Yes	Yes	Yes
haz5	Conduct regular servicing of the SFPUC vehicle fleet and equipment so that leaks/drips/spills of contaminants are minimized. (Phase 1)	No	No	No
haz6	Review and standardize SFPUC boating practices . (Phase 1)	No	No	No

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**TABLE II-1 (Continued)
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
haz7	Develop and implement a cleanup and enhancement plan for Skyline Quarry . (Phase 1)	Yes	Yes	Yes
haz8	Identify high-risk spill potential areas and implement measures to reduce the risk of hazardous spills. (Phase 1)	Yes	Yes	Yes
haz9	Install barriers on Upper Crystal Springs Dam to prevent vehicles from landing in the reservoir during an accident. (Phase 1)	Yes	Yes	Yes
haz10	Develop spill response and containment measures for SFPUC vehicles on the Watershed. (Phase 1)	No	No	No
haz11	Train staff in spill response and containment measures for SFPUC vehicles. (Phase 1)	No	No	No
haz12	Maintain a network of hazardous materials cleanup storage lockers at accessible locations on each reservoir and at areas where spill potential is high. (Phase 1)	No	No	No
haz13	Require Caltrans to include spill containment and diversion facilities in new and upgraded facilities along I-280 and Highway 92. (Phase A)	No	No	No
haz14	Practice interagency spill response . Where needed, improve elapsed time between spill event and notification of SFPUC staff. (Phase 1B)	No	No	No
haz15	Maintain routine contact with the Federal Aviation Administration regarding notification of jet fuel releases . (Phase 1B)	No	No	No
<u>Waste – Human and Animal (was)</u>				
was1	Inspect all SFPUC facilities to assess conditions of vault, chemical, and composting toilets ; repair/replace as necessary to minimize risk of contamination of water supplies. (Phase 2)	Yes	Yes	No
was2	Inspect sanitation and waste treatment systems at Crystal Springs Golf Course, Filoli Estate, Caltrans rest stop/yard, and San Mateo County Parks to assess condition, performance, and impacts on surface and groundwater quality. (Phase 2)	No	No	No

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SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
was3	Assess the contribution of wildlife excrement to water quality degradation. Based on monitoring, develop management strategy if necessary. (Phase 3)	No	No	No
was4	Consult with San Mateo County regarding new residential development . (Phase A)	No	No	No
was5	Coordinate with the GGNRA to install restrooms on Army Road . (Phase 1)	Yes	Yes	No
<u>Roads (roa)</u>				
roa1	Evaluate, rank the importance of, and implement modifications to the existing road system to reduce erosion and sedimentation. (Phase 1)	No	No	No
roa2	Relocate existing high-use roads /road segments in proximity to streams (i.e., within 150 feet) that are the primary source of excessive erosion and sedimentation. (Phase 1)	Yes	Yes	Yes
roa3	Modify the grading and drainage of existing high-use roads /road segments to reduce the potential for erosion and sedimentation. (Phase 1)	Yes	Yes	Yes
roa4	Close and retire (regrade, revegetate, restore) roads not needed for safety or access and minimize problem areas by paving, installing culverts, or other stabilization methods. (Phase 2)	Yes	Yes	Yes
roa5	Reduce the need for multiple maintenance access roads on infrastructure easements by consolidation. (Phase 2)	Yes	Yes	Yes
roa6	Inspect and manage unpaved roads , stormwater collection systems, unlined stormwater conveyance systems, and other stormwater facilities according to the California Forest Practices Act Rules. (Phase 2A)	Yes	Yes	Yes
roa7	Maintain fire roads to minimize sediment generation through effective installation of waterbars, avoidance of unnecessary grading, and paving short lengths of road. (Phase 1B)	Yes	Yes	Yes
roa8	Restrict access on low-use roads by gates or barriers, allow revegetation, and use mowing as the road maintenance, or provide waterbars or broad dips. (Phase 2)	Yes	Yes	Yes

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**TABLE II-1 (Continued)
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
roa9	Periodically inspect closed roads to ensure vegetation stabilization and drainage measures are operating as planned; conduct reseeding and drainage maintenance as needed. (Phase 2B)	No	No	No
roa10	Conduct annual inspections and repairs to reshape roads to conserve material, retain the design cross-section, and prevent or remove irregularities that retard normal surface runoff. (Phase 2B)	No	No	No
roa11	Monitor road conditions during heavy-use periods and/or unfavorable weather conditions; limit use on the basis of road condition; close roads seasonally if warranted. (Phase A)	No	No	No
roa12	Design, site, and construct new roads and trails following guidelines appropriate for wildland conditions. (Phase A)	No	No	No
<u>Conservation and Reclamation of Water (con)</u>				
con1	Periodically evaluate landscaping and irrigation practices for water efficiency; implement water conservation techniques where necessary. (Phase 1B)	No	No	No
con2	Evaluate the feasibility of, and where possible, use raw untreated water or reclaimed water for roadways, Filoli Estate, Crystal Springs Golf Course, irrigation, sanitation facilities, fire suppression, etc. (Phase 1)	No	No	No
con3	Identify appropriate locations for additional native trees and shrubs. (Phase 1)	No	No	No
con4	Reduce large volumes of brush to increase water yields through a reduction in transpiration losses. (Phase 1B)	Yes	Yes	Yes

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SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
Fire Management (fir)				
fir1	Prior to authorizing the use of any vehicle or equipment on the Watershed require that SFPUC equipment comply with fire prevention regulations . (Phase 1A)	No	No	No
fir2	Install seven dry hydrants at specified locations to reduce the complexity of long-distance water shuttle operations. (Phase 1)	Yes	Yes	Yes
fir3	Install and maintain five helispots at specified locations on the Watershed. (Phase 1)	Yes	Yes	Yes
fir4	Work with adjacent landowners to install two additional hydrants at specified locations. (Phase 1)	Yes	Yes	Yes
fir5	Install two 10,000 gallon metal water tanks at specified locations. (Phase 1)	Yes	Yes	Yes
fir6	Undertake improvements to provide better access to enhance fire suppression capabilities. (Phase 1)	Yes	Yes	Yes
fir7	Identify and construct necessary road improvements including necessary turnouts, turnarounds, and safety signs . (Phase 1)	Yes	Yes	Yes
fir8	Complete the fuel management projects listed in Chapter 5 and described in the Fire Management Element (Appendix A, Volume I) to reduce fuels on the Watershed. (Phase 1B)	Yes	Yes	Yes
fir9	LRMS staff shall report and provide preliminary assessment of all fires to Watershed dispatch who will call 911 and notify the Watershed manager. (Phase A)	No	No	No
fir10	Initial response 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. (Phase A)	No	No	No
fir11	If an evacuation is necessary, Watershed dispatch shall contact the appropriate agencies and set up IC system. (Phase A)	No	No	No
fir12	Prepare and distribute maps and information showing safe zones, turnout locations, helispots, fuel break locations, natural barriers, evacuation routes, and areas of limited suppression. (Phase 1)	No	No	No

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**TABLE II-1 (Continued)
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
fir13	Assign the duties of implementation of the Fire Management Plan and incident commander to an existing or new LRMS staff member . (Phase 1)	No	No	No
fir14	Establish permanent transects and vegetation plots in treatment and control areas to determine effects of fuel management treatments. (Phase 2)	No	No	No
<u>Safety and Security (saf)</u>				
saf1	Develop law enforcement procedures for SFPUC and LRMS staff. (Phase 1)	No	No	No
saf2	Develop and implement an LRMS safety and security program to address safety and emergency response procedures on the Watershed. (Phase 1)	No	No	No
saf3	Designate and train an LRMS safety coordinator to oversee the safety and security program and train employees in safety and emergency response procedures. (Phase 1)	No	No	No
saf4	Regularly inspect and maintain the facilities and areas used by the public. (Phase 1B)	No	No	No
saf5	Conduct regular, on-site risk assessment inspections of SFPUC facilities in conjunction with the safety and security program and other maintenance activities. (Phase 1B)	No	No	No
saf6	Periodically and systematically inspect Watershed perimeter fencing, access gates, and locks and repair as required to minimize trespassing, illegal dumping, etc. (Phase 1B)	No	No	No
saf7	Develop and periodically revise an Emergency Response Plan . (Phase 1B)	No	No	No
saf8	Periodically conduct emergency response practice drills . (Phase 1B)	No	No	No
saf9	Periodically evaluate and update the safety and security program . (Phase 1B)	No	No	No
saf10	Conduct daily boat patrols of all Peninsula reservoirs to assess water quality emergencies, trespassing problems, and other emergency situations. (Phase 1B)	No	No	No
saf11	Maintain four LRMS patrol boats for ongoing patrols and emergencies. (Phase 1B)	No	No	No

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SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
saf12	Develop, publish, and periodically update a Watershed Manual that addresses SFPUC operations and maintenance procedures, emergency response procedures, and the safety and security program. (Phase 1B)	No	No	No
saf13	Work with Caltrans and San Mateo County to install signs and emergency call boxes and emergency response telephone numbers on I-280, and Highway 92 about risk of fires, vehicle accidents, risk of spills. (Phase 2)	No	No	No
saf14	Coordinate with the San Mateo County Sheriff and Fire Departments to develop and periodically update an evacuation plan for disasters. (Phase 1B)	No	No	No
saf15	Review utility emergency response plans for non-SFPUC pipeline failure procedures . (Phase 1)	No	No	No
saf16	Coordinate with appropriate agencies in maintaining and enforcing the safety and security program. (Phase 1A)	No	No	No
saf17	Coordinate with San Mateo County to develop a schedule of fines and penalties for Watershed infractions. (Phase 1)	No	No	No
<u>Vegetation and Soil Management (veg)</u>				
veg1	Prepare and implement a Vegetation Management Plan . (Phase 2)	No	No	Yes
veg2	Prior to initiating any Watershed activity, consult the GIS database for vegetation communities and associated rare, threatened, endangered, and sensitive species. (Phase A)	No	No	No
veg3	Prior to any Watershed activity that may affect an Ecological Sensitivity Zone (ESZ) , survey for special status plants and map observed occurrences on the GIS database. (Phase A)	No	No	No
veg4	Prior to initiating any construction project involving grading, proponent must prepare and implement a grading plan , subject to approval by SFPUC staff. (Phase A)	No	No	No
veg5	Develop native species planting program in coordination with fire management activities. (Phase 2)	No	No	No

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**TABLE II-1 (Continued)
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
veg6	Identify and remove invasive exotic plant species using IPM practices. (Phase 2B)	Yes	Yes	No
veg7	Identify and remove stands of exotic forest species such as eucalyptus, Monterey pine, and Monterey cypress. (Phase 2B)	Yes	Yes	No
veg7.1	Identify and preserve stands of exotic trees that serve as important overwintering roosting sites for the Monarch butterfly or that serve as important roosting and nesting sites for various raptors and other birds protected by CDFG Code 3503. (Phase 2B)	No	No	No
veg7.2	Identify and preserve stands of exotic trees which serve to demarcate the old Spanish land grants and which are studied by geologists due to their location across the San Andreas Fault. (Phase 2B)	No	No	No
veg8	Develop forest management prescriptions and guidelines for both hardwood and coniferous tree species. (Phase 2)	No	No	No
veg9	Follow erosion control BMPs for protection of wetlands, streams, and shoreline areas. (Phase A)	No	No	No
veg10	Identify areas of slope instability and failure based on soils, geology, and landslide data layers in the GIS. Prevent erosion by following the BMPs. (Phase 1)	No	No	No
veg11	Identify and indicate in the GIS areas where land disturbance has accelerated mass movement or soil erosion processes to unacceptable levels. Stabilize these areas using soil conservation BMPs. (Phase 1)	No	No	No
veg12	Establish and conduct long-term hillslope erosion and sediment control monitoring to evaluate the effectiveness of adopted protection measures. (Phase 2B)	No	No	No
veg13	Develop and implement an IPM program for the LRMS, specific to the Watershed and Watershed resources . (Phase 1)	No	No	Yes
veg14	Coordinate with PG&E in clearing vegetation as appropriate around powerlines, transformers, and pole structures. (Phase 1)	Yes	Yes	Yes
veg15	Collaborate with CNPS and Caltrans in restoring native plant communities along the I-280 right-of-way . (Phase 2A)	No	No	No

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
veg16	Coordinate with CDFG’s restoration of the San Mateo thornmint habitat . (Phase 1)	No	No	No
veg17	Encourage agencies to minimize disturbance of serpentine bedrock or soils to prevent erosion of asbestos fibers into the water supply. (Phase 1)	No	No	No
<u>Wildlife (wil)</u>				
wil1	Prior to planning or construction, conduct site-specific review of new structures , linear facilities, parking lots, roads, or trails to avoid adverse impacts to wildlife. (Phase A)	No	No	No
wil2	Prior to undertaking any Watershed activity in a high ESZ, survey affected habitat to determine the presence of listed or sensitive taxa and to minimize adverse effects. (Phase A)	No	No	No
wil3	Identify and protect primary wildlife movement corridors and design fencing, culverts, stream crossings, and underpasses to accommodate wildlife passage. (Phase 3)	No	No	No
wil4	Relocate or eliminate unnecessary infrastructure and facilities to reduce fragmentation and disruption of terrestrial habitat. (Phase 3)	Yes	Yes	No
wil5	Remove or relocate unnecessary fencing to manage wildlife movement. (Phase 3)	Yes	Yes	Yes
wil6	Establish a standard for number of snags/fallen trees per acre for wildlife use and nutrient cycling. Downwood and brush piles should be left as habitat and cover. (Phase 3)	No	No	No
wil7	Create palatable re-sprouting browse through mechanical vegetation treatments or prescribed fire in brush and woodland communities. (Phase 3A)	Yes	Yes	Yes
wil8	Maintain an up-to-date database on sensitive species within the Watershed. (Phase 1A)	No	No	No
wil9	Develop a comprehensive, multi-species Habitat Conservation Plan for the species of concern on the Watershed. This HCP should cover the actions set forth in this plan and other SFPUC activities anticipated over the next 50 years. (Phase 2)	No	No	Yes

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
wil10	Institute seasonal prohibition of activities during breeding periods and enact appropriate mitigation measures to protect species of concern. (Phase 1)	No	No	No
wil11	Inventory and map butterfly habitat . (Phase 1)	No	No	No
wil12	Monitor the effects of natural processes that help maintain the variability of the ecosystem, but could negatively affect sensitive wildlife species. (Phase A)	No	No	No
wil13	Monitor predator-prey relationships to provide a basis for management and control, especially for ground squirrels, golden eagles, mountain lions, coyote, and deer. (Phase 3B)	No	No	No
wil14	Monitor road kills to better understand wildlife movement patterns. Design and install wildlife passage structures to minimize losses. (Phase A)	Yes	Yes	Yes
wil15	Monitor pest animal populations to evaluate success in meeting population targets. (Phase 2B)	No	No	No
wil16	Support CDFG in their efforts to enforce and monitor state rules and regulations on the Peninsula Fish and Game Refuge. (Phase 1A)	No	No	No
<u>Aquatic Zone Protection (aqu)</u>				
aqu1	Conduct site-specific review to assure that new facilities or activities are not located within a High Water Quality Vulnerability Zone. (Phase A)	No	No	No
aqu2	Manage reservoir water levels according to the Operations Plan to maintain relatively stable water levels, where feasible subject to operational requirements and water availability. (Phase 1)	No	No	No
aqu3	Identify and prioritize for rehabilitation reservoir shoreline areas within the High WQVZ which are providing excessive sedimentation into the reservoirs. (Phase 1)	No	No	No
aqu4	Prohibit or regulate the timing or intensity of land use activities in high risk shoreline areas consistent with other management actions in this Plan. (Phase 1A)	No	No	No

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
aqu5	Rehabilitate shoreline areas using structural shoreline protection practices in areas where erosion and sedimentation cannot be adequately controlled by land use restrictions. (Phase 1)	Yes	Yes	Yes
aqu6	Conduct a Sediment Transport Study to identify stream segments with excessive bank erosion or channel sedimentation and prioritize segments for rehabilitation. (Phase 1)	No	No	No
aqu7	Rehabilitate stream segments according to the determined priorities, and return them to a dynamic equilibrium where the channel is stable. (Phase 2)	Yes	Yes	Yes
aqu8	Establish and conduct long-term stream corridor monitoring to evaluate the effectiveness of adopted protection measures and/or rehabilitation projects. (Phase 2B)	No	No	No
aqu9	Create new wetland habitat , where water sources are adequate, as part of a wetland mitigation banking system to offset impacts from SFPUC activities. (Phase A)	No	No	No
aqu10	Develop a sedimentation basin and pond management program in conjunction with preparation of the HCP. (Phase 2)	No	No	No
aqu11	Once sediment detention basins are in place, establish monitoring , cleanup, and dredging guidelines dependent on sediment loading rate. (Phase A)	No	No	No
aqu12	If needed for fire management, install long-term sediment retention basins that can be readily maintained. (Phase A)	Yes	Yes	Yes
aqu13	In conjunction with development of the HCP and sedimentation basin management program, obtain a “blanket” Streambed Alteration Agreement (MOU) from the CDFG for development, operation, and maintenance of sediment detention basins. (Phase 2)	No	No	Yes
aqu14	Periodically update the Bathymetry Study for the Peninsula reservoirs to assess the impacts of stream and sedimentation basin rehabilitation on reduction in sediment transport. (Phase 2B)	No	No	No
<u>Fisheries (fis)</u>				
fis1	Maintain access for fish species of concern from reservoirs to upstream spawning grounds. (Phase 1)	No	No	No

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fis2	Identify all unauthorized stream diversions and remove those that are detrimental to fish passage in adherence to all existing regulations. (Phase 2)	No	No	No
fis3	Ensure that any subimpoundments within perennial or intermittent drainages allow for fish passage. (Phase 2B)	No	No	No
fis4	Consult with CDFG regarding the installation of fish screen and/or fish passage structures where stream alteration/diversion cannot be avoided. (Phase 2A)	No	No	No
fis5	Allow an appropriate level of accumulation of woody debris to occur in stream channels, consistent with CDFG recommendations, to create pools and riffles, reduce bank steepness, and provide cover. (Phase 2)	No	No	No
fis6	Identify and adopt alternative non-toxic management practices to protect aquatic resources. (Phase 1)	No	No	Yes
fis7	Dechlorinate water discharged from the Pulgas Water Temple into Upper Crystal Springs Reservoir by chemical means. (Phase 1A)	No	No	Yes
fis8	In conjunction with CDFG, control populations of predaceous exotic game fish. (Phase 2B)	No	No	No
fis9	Conduct annual surveys of fish populations and habitat conditions in conjunction with water temperature and water quality monitoring. (Phase 2B)	No	No	No
fis10	Conduct studies and surveys in coordination with CDFG regarding management of the Peninsula Fish and Game Refuge . (Phase A)	No	No	No
fis11	Participate in the Pilarcitos Creek Restoration Project . (Phase 1A)	No	No	No
fis12	Cooperate with state implementation of programs to increase salmon and steelhead populations . (Phase 1A)	No	No	No

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**TABLE II-1 (Continued)
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
<u>Cultural Resources (cul)</u>				
cul1	Conduct appropriate levels of review prior to undertaking activities involving surface disturbance and/or excavation to avoid damage to buried cultural resources. (Phase A)	No	No	No
cul2	Authorize data recovery by qualified professionals when deposits cannot be preserved through avoidance or protection measures. (Phase A)	No	No	No
cul3	When considering demolition or alteration of an historic structure , consult with an architectural historian to determine the feasibility and suitability of relocation. (Phase A)	No	No	No
cul4	Evaluate and document the significance of cultural resources threatened by demolition or alteration through application of state and federal criteria. (Phase A)	No	No	No
cul5	Employ non-destructive methods of research. Data, objects, and specimens recovered from research sites shall be conserved and curated according to legal requirements. (Phase A)	No	No	No
cul6	Suspend excavation activities in the event that suspected cultural resources are uncovered; consult with a qualified archeologist. (Phase A)	No	No	No
cul7	Suspend excavation activities in the event that human remains are discovered and immediately inform proper authorities. (Phase A)	No	No	No
cul8	When previously unknown cultural resources are discovered, report new findings to the California Historical Resources Information System (Information Centers). (Phase A)	No	No	No
cul9	Implement protective measures to eliminate and minimize effects of public access on cultural resources. (Phase 2)	No	No	No
cul10	Prior to new construction, consider re-use of existing historic structures for departmental uses. (Phase A)	No	No	No

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**TABLE II-1 (Continued)
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
cul11	Periodically inspect historic structures for pest damage and use IPM techniques to control pests in historic structures. (Phase 2B)	No	No	No
cul12	Periodically monitor known significant cultural resource sites for evidence of disturbance, damage, or vandalism. (Phase 2B)	No	No	No
<u>Environmental Compliance (env)</u>				
env1	Assign environmental compliance duties to an LRMS staff person to oversee and facilitate all environmental compliance within the Watershed. (Phase 1)	No	No	No
env2	Review new projects or activities to determine if such activities qualify as a “project” as defined by CEQA. If activity is subject to CEQA, determine whether subsequent environmental review is needed. (Phase A)	No	No	No
env3	Require consultation with the LRMS environmental compliance staff person as a condition of all new leases and renewals granted within the Watershed. (Phase A)	No	No	No
env4	Require that SFPUC staff consult and get assistance from the LRMS environmental compliance staff person prior to implementation of Watershed activities. (Phase A)	No	No	No
env5	Incorporate mitigation measures identified in the program-level EIR into the Peninsula Watershed Management Plan. (Phase 1)	No	No	No
env6	Provide comments on environmental documents for projects within the larger Watershed boundaries to ensure that potential adverse effects on SFPUC lands are mitigated. (Phase A)	No	No	No
<u>Lease and Permit Requirements (leas)</u>				
lea1	Develop a Scientific, Educational, and Agency Permit Reservation System . (Phase 1)	No	No	No
lea2	Develop a Watershed Information and Public Access Permit Reservation System that is informative and easy to use. (Phase 1)	No	No	No

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**TABLE II-1 (Continued)
SUMMARY OF PENINSULA WATERSHED MANAGEMENT ACTIONS**

Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
lea3	In coordination with the Bureau of Commercial Land Management, ensure that all lease renewals and new leases include water quality protection measures, required BMPs, emergency response plans, monitoring programs, and IPM policies and practices, among others. (Phase 1)	No	No	No
lea4	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. (Phase 1B)	No	No	No
lea5	Prior to approval of leases and permits requiring the use of pesticides, review the Chemical Application Management Program (CHAMP) prepared by the lessee or permittee, in coordination with the SFPUC IPMP and the LRMS IPM Program. (Phase A)	No	No	No
lea6	Prior to the approval of any lease or permit conduct a GIS database query to determine presence of significant cultural or natural resources. (Phase A)	No	No	No
lea7	Assign the duties of lease coordinator to an existing or new LRMS staff member. (Phase 1)	No	No	No
lea8	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. (Phase B)	No	No	No
<u>Public and Agency Outreach (pub)</u>				
pub1	Develop and implement an overall Watershed Public Education Program . (Phase 1)	No	No	No
pub2	Designate an LRMS staff person to oversee the Watershed Public Education Program . (Phase 1)	No	No	No
pub3	Establish “gateway” information kiosks at major entryways to the Watershed. (Phase 1)	Yes	Yes	Yes
pub4	Establish a Watershed Visitor Education Center to provide a gathering place for the discussion of water quality/supply concerns, water conservation, ecological resource studies, etc. (Phase 2)	Yes	Yes	Yes
pub5	Develop a coordinated graphics and signage program and supporting manual . (Phase 2)	No	No	No

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
pub6	Develop a mobile Watershed exhibit to be displayed at popular Bay Area locations and local schools. (Phase 1)	No	No	No
pub7	Develop a public use areas map to be distributed at Watershed kiosks, the Watershed Visitors Education Center (if constructed), and by docents. (Phase 1)	No	No	No
pub8	Develop brochures and displays to be used at Watershed kiosks and the Education Center. (Phase 1)	No	No	No
pub9	Publish rules and regulations regarding prohibited and permitted uses, potential hazards, emergency numbers, etc. in brochures, bulletins, water bill inserts, newsletters, etc. (Phase 1)	No	No	No
pub10	Provide and periodically update select Watershed information to the public and other agencies using SFPUC's Internet website . (Phase 1A)	No	No	No
pub11	Develop a docent program to allow individuals access to select areas of the Watershed that are generally closed to public access. (Phase 1)	No	No	No
pub12	Collaborate with appropriate agencies/groups on the development of educational materials . (Phase A)	No	No	No
pub13	Develop written agreements with public and private landowners outside of SFPUC-owned Watershed lands to institute voluntary restrictions on land uses and activities that will protect water quality. (Phase 1)	No	No	No
pub14	Coordinate with other applicable agencies and organizations in the compilation and maintenance of resource databases . (Phase A)	No	No	No
pub15	Coordinate with federal, state, regional, and local agencies on the development of Watershed educational displays and brochures . (Phase 2)	No	No	No
pub16	Coordinate with Bay Area schools and universities to develop Watershed-based curriculum/projects. (Phase 1)	No	No	No

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
pub17	Identify and implement Watershed ecological restoration projects or monitoring studies as components of Watershed-based curriculum in applicable Bay Area schools and universities. (Phase 3)	No	No	No
<u>Staffing and Training (sta)</u>				
sta1	Evaluate all existing LRMS staff responsibilities to assure there are an adequate number of positions. (Phase 1)	No	No	No
sta2	Evaluate all Watershed operations and maintenance activities and establish standards for staff and time allocations for each activity. (Phase 1)	No	No	No
sta3	Assign an LRMS staff member to oversee Watershed maintenance activities not under the direct authority of LRMS staff. (Phase 1)	No	No	No
sta4	Provide adequate staff to monitor legal and illegal Watershed activities. (Phase 1)	No	No	No
sta5	Provide additional training for Watershed keepers and LRMS staff to attain Peace Officer status. (Phase 1)	No	No	No
sta6	Conduct water quality and ecological resources training for LRMS staff, operations supervisors and crews, SFPUC UEB engineers, and project managers. (Phase 1)	No	No	No
sta7	Conduct training classes for Watershed managers, Watershed keepers, and crew supervisors on the management and protection of significant cultural resources . (Phase 1)	No	No	No
sta8	Provide mandatory training for all appropriate SFPUC staff to become familiar with this Watershed Management Plan and the required procedures. (Phase 1)	No	No	No
sta9	Train selected staff and docents to provide meaningful interpretation of Watershed resources and to assist with community outreach. (Phase 1)	No	No	No
sta10	Provide fire-related training to select staff members as appropriate. (Phase 1)	No	No	No

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
sta11	Establish an employee training program for safety and emergency response procedures. (Phase 1)	No	No	No
<u>Fiscal Framework (fic)</u>				
fic1	Evaluate costs and benefits related to leasing, permitting, and public access activities on the Watershed. (Phase A)	No	No	No
fic2	Continue/authorize or modify/prohibit specific lease and/or permit activities based on the results of the cost and benefit analysis. (Phase A)	No	No	No
fic3	Calculate the appropriate charges for lease activities and permit fees using the cost/benefit analysis method discussed under Action fic1. (Phase A)	No	No	No
fic4	Modify existing leases and permit fees , and set future leases and permits fees based on the calculations from Action fic3. (Phase A)	No	No	No
fic5	Target funds for Watershed management activities and staff positions according to Watershed Plan priorities, available funding, and the ability to provide funding. (Phase 1A)	No	No	No
fic6	Evaluate costs and benefits associated with specific management activities and tasks prior to authorization of funds. (Phase A)	No	No	No
fic7	Evaluate alternative sources of funding and implementation methods for continuing to provide public use activities on the Watershed. (Phase 1B)	No	No	No
fic8	Evaluate and rank all lands within the hydrologic Watershed outside of SFPUC’s landholdings for potential purchase or establishment of easements. (Phase 1)	No	No	No
fic9	Coordinate with upstream landowners to develop and place a natural and cultural resources conservation easement over non-SFPUC owned Watershed lands. (Phase 1A)	No	No	No
fic10	Develop and implement a schedule of fines and/or penalties for failure to meet lease requirements. (Phase 1)	No	No	No

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
<u>Information Management (inf)</u>				
inf1	Establish and staff a Watershed Natural Resources Center (in a central location) for use by SFPUC staff and other interested individuals and groups. (Phase 2)	No	No	No
inf2	Assign GIS database operations maintenance duties to an LRMS staff member. (Phase 1)	No	No	No
inf3	As new data and findings become known, enter data into the SFPUC GIS database . (Phase A)	No	No	No
inf4	Prior to any operations and maintenance and/or construction activities, request a database check for any known sensitive ecological or cultural resources. (Phase A)	No	No	No
inf5	Assign the duties of Web Page maintenance to an LRMS staff member. (Phase 1)	No	No	No
inf6	Disseminate and acquire significant information to and from applicable agencies and local and regional databases (e.g., California Natural Diversity Data Base). (Phase A)	No	No	No
<u>Design and Construction Requirements (des)</u>				
des1	Meet with proponents of new plans and projects prior to detailed design or development to identify requirements of the Watershed Management Plan which must be met. (Phase 1A)	No	No	No
des2	Evaluate all proposed plans and projects as part of the Review Process for Proposed Plans and Projects using the Watershed Goals and Policies Compliance Checklist . (Phase 1A)	No	No	No
des2.1	Prior to the approval of any lease or permit involving construction or the introduction of additional people into the Watershed, conduct a carrying capacity analysis. (Phase A)	No	No	No
des3	Assign an LRMS staff person to be the Proposed Projects Review Coordinator . (Phase 1)	No	No	No
des4	Prior to initiation of any new construction, or renovation/alteration, construct permanent perimeter fencing around the construction zone. (Phase A)	No	No	No

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Management Action Number ¹	Summary of Management Actions ²	Potential Adverse Physical Effects	Analyzed in this Program-Level EIR	May Require Project-Specific Environmental Review ³
des5	Ensure design guidelines are met prior to approval of new construction activities or renovation/alteration of existing facilities, structures and roads. (Phase A)	No	No	No
des6	Prior to the design and construction of new facilities and trails ensure compliance with all legally mandated accessibility standards . (Phase A)	No	No	No
des7	Establish a universal access program to address all Watershed facilities and trails. (Phase 1)	No	No	No
des8	Using the priorities established in Action des7, implement universal access improvements at SFPUC facilities and trails. (Phase 2)	Yes	Yes	Yes
des9	Ensure that a dust abatement program is implemented as part of all construction projects. (Phase A)	No	No	No
<u>Fifield/Cahill Ridge Trail (tra)</u>				
tra1a	Alternative A – Unrestricted Public Access with Termination at Highway 92/Skyline Boulevard: provides for unrestricted public access subject to specific requirements. (Phase 1)	Yes	Yes	No
tra1b	Alternative B – Unrestricted Public Access with Termination at Skyline Quarry: provides for unrestricted public access subject to specific requirements. (Phase 1)	Yes	Yes	No
tra1c	Alternative C – Access by Annual Permit: provides for pedestrian access subject to specific requirements. (Phase 1)	Yes	Yes	No
tra1d	Alternative D – Docent-Led Access: allows for docent-led access for hikers subject to specific requirements. (Phase 1)	Yes	Yes	No
tra2	If Alternative A or B – Unrestricted Public Access is to be provided, then develop the Programmatic Skyline Boulevard Alignment, a southern extension of the project, to connect to the Kings Mountain Trail. (Phase A)	Yes	Yes	Yes

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CHAPTER III

PROGRAM-LEVEL ENVIRONMENTAL SETTING AND IMPACTS

A. EXISTING PLANS AND POLICIES

1.0 LOCAL AGENCIES

The City and County of San Francisco, as a chartered city and county, and its SFPUC, as a public utility, receive intergovernmental immunity under California Government Code Sections 53090 et seq. Such immunity exempts the extraterritorial lands owned by City and County of San Francisco through its SFPUC, from the planning and building laws of a city or county in which those lands are located. Thus, the zoning and building codes, general plans, specific plans, and other planning and building policies of San Mateo County do not apply to the *Peninsula Watershed Management Plan*. Under Government Code Section 65402(b), San Mateo County is entitled to review and determine the consistency of a project on the Watershed with the applicable general plan prior to construction of any structures contemplated under the Management Plan, although the County's determinations are not binding on San Francisco. Development of non-SFPUC property surrounding the Watershed, however, would be subject to the planning and building laws of the local jurisdiction. In addition, the SFPUC has control over the management, use, and control of its Watershed lands under the San Francisco City Charter, Section 4.112. San Francisco's planning and building laws, to the extent that they apply to San Francisco's extraterritorial lands, could be applicable to the Watershed lands, as long as they do not conflict with the SFPUC's Charter responsibilities.

The SFPUC seeks to manage its lands in a way that is consistent with San Francisco's planning and building laws and works cooperatively with local jurisdictions to avoid conflicts with local planning and building laws. Nevertheless, the laws of other jurisdictions are nonbinding on the SFPUC's management of its lands. The following excerpts from the general plan of the City and County of San Francisco and the San Mateo County general plan are presented in this report for informational purposes only.

1.1 CITY AND COUNTY OF SAN FRANCISCO

City and County of San Francisco General Plan

Developed in accordance with state law, *The San Francisco General Plan* (General Plan) sets forth the comprehensive, long-term land use policy for the City and County of San Francisco. The General Plan contains eight issue-oriented Elements, including: Residence, Commerce and Industry, Recreation and Open Space, Transportation, Urban Design, Environmental Protection,

Community Facilities, and Community Safety. The General Plan also includes 10 area plans that were developed as tools for residents and the City to guide development in specific geographic districts. The Peninsula Watershed is not included in an area plan and is rarely addressed by the plans and policies of the General Plan directly because it is outside of the City's boundary; consequently, for the reasons stated above, such plans and policies are presented in this report solely for informational purposes. Policies of the General Plan elements that could be applicable to the Management Plan issues are summarized below. Policies of the General Plan are stated as objectives, with more specific policy statements listed under each objective. Four of the eight General Plan elements contain relevant policy issues concerning the Watershed area: Recreation and Open Space, Environmental Protection, Transportation, and Community Safety.

Recreation and Open Space Element

Objective 1: Preserve large areas of open space sufficient to meet the long-range needs of the Bay region.

Policy 1: Protect the natural character of regional open spaces and place high priority on acquiring open spaces noted for unique natural qualities.

Policy 2: Make open space lands already in public ownership accessible to the public for compatible recreational uses.

- Public access should be provided by the San Francisco Water Department¹ to portions of its Watershed lands which have high recreational value, subject to restriction required to protect water quality and water production, rare, and endangered plant and animal species, and preserve wildlife habitats, archaeological, and natural resources.
- Future leases and lease renewals on Watershed lands should be consistent with protection of existing natural values. Watershed lands should be managed to limit potential fire and erosion hazards. Access should be consistent with the legal rights of existing tenants, and with the intent of existing scenic and recreational easements. If San Francisco Water Department property becomes surplus, appropriate land areas should be dedicated for use as public open space.

Policy 13: Preserve and protect significant natural resource areas.

- Once protected from development by public ownership, the natural resources of the site should be protected and enhanced through restrictions on use and appropriate management policies...Natural area management plans should be developed for publicly owned land...[The management plan] should also identify policies governing access and appropriate recreational use and enjoyment of protected natural areas to ensure that the natural resource values are not diminished or impacted by public use.

¹ The San Francisco Water Department is now the Water Supply and Treatment Division of the San Francisco Public Utilities Commission.

Regional Policy 3: Increase the accessibility of regional parks by...creating regional bike and hiking trails.

- A regional hiking and bicycle trail system should be developed for the San Francisco Bay Area to increase recreational opportunities throughout the area, and to link parks and public open space of local and regional importance.

Citywide Policy 8: Develop a recreational trail system that links City parks and public open space, ridge lines, and hilltops, the Bay and ocean, and neighborhoods, and ties into the regional recreational trails system,

- Trails should be planned and designed to avoid impacting environmentally sensitive areas such as wetlands, and in a manner consistent with the policies of the land management agency through which the trail traverses.

Environmental Protection Element

Objective 1: Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources.

Policy 1: Conserve and protect the natural resources of San Francisco.

Policy 2: Improve the quality of natural resources.

Policy 3: Restore and replenish the supply of natural resources.

Objective 2: Implement broad and effective management of natural resources.

Policy 1: Coordinate regional and local management of natural resources.

Policy 2: Promote citizen action as a means of voluntarily conserving natural resources and improving environmental quality.

Policy 3: Provide environmental education programs to increase public understanding and appreciation of our natural surroundings.

Objective 4: Assure that the ambient air of San Francisco and the Bay region is clean, provides maximum visibility, and meets air quality standards.

Objective 5: Assure a permanent and adequate supply of fresh water to meet the present and future needs of San Francisco.

Policy 1: Maintain an adequate water distribution system within San Francisco.

Policy 2: Exercise controls over development to correspond to the capabilities of the water supply and distribution system.

Policy 3: Ensure water purity.

Objective 6: Conserve and protect the fresh water resource.

Objective 7: Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the City's citizens.

Policy 1: Preserve and add to public open space in accordance with the objective and policies of the Recreation and Open Space Element.

Policy 2: Protect land from changes that would make it unsafe or unsightly.

Objective 8: Ensure the protection of plant and animal life in the City.

Policy 1: Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.

Policy 2: Protect the habitats of known plant and animal species that require a relatively natural environment.

Policy 3: Protect rare and endangered species.

Objective 9: Reduce transportation-related noise.

Policy 1: Enforce noise emission standards for vehicles.

Objective 11: Promote land uses that are compatible with various transportation noise levels.

Transportation Element

Objective 3: Maintain and enhance San Francisco's position as a regional destination without inducing a greater volume of through automobile traffic.

Community Safety Element

Objective 1: Improve the coordination of City programs that mitigate physical hazards, help individuals and organizations prepare for and respond to disasters, and recover from the impacts of disasters.

Policy 1: Improve the coordination of disaster-related programs within City departments.

Policy 2.9: Consider information about geologic hazards whenever City decisions that will influence land use, building density, building configurations or infrastructure are made.

1.2 COUNTY OF SAN MATEO

San Mateo County General Plan

Developed in accordance with state law, *The San Mateo County General Plan* (General Plan) sets forth the comprehensive, long-term land use policy for San Mateo County. The General Plan contains 16 issue-oriented elements: vegetative, water, fish and wildlife resources; soil resources; mineral resources; visual quality; historical and archaeological resources; park and recreation resources; general land use; urban land use; rural land use; water supply; wastewater; transportation; solid waste; housing; natural hazards; and man-made hazards. The designations, definitions, and policies of the General Plan elements that address the Watershed area are summarized below. The elements that address the Watershed include vegetative, water, fish and wildlife resources; soil resources; visual quality; historical and archeological resources; park and recreation resources; rural land use; transportation; natural hazards; and man-made hazards. Policies of the General Plan that address the Watershed area are presented for informational purposes only.

Vegetative, Water, Fish and Wildlife Resources Element

Areas within the Peninsula Watershed are designated by the County of San Mateo as sensitive habitats for plants, invertebrates, reptiles, and amphibians. These areas exist mainly around the reservoirs within the Watershed. Riparian corridors are included as sensitive habitat and are noted along major streams within the Watershed. The entire Watershed area is also designated as a wildlife refuge, reserve, and scientific study area. As indicated in the General Plan, the Watershed contains a variety of vegetative types, including chaparral, freshwater marsh, mixed evergreen forest, coniferous forest, and grassland.

Definitions

Sensitive habitats – Any area where the vegetative, water, fish, and wildlife resources provide especially valuable and rare plant and animal habitats that can be easily disturbed or degraded.

Vegetative resources – Plants and plant communities, including timber but excluding agricultural crops.

Fish and wildlife – All non-domesticated animals.

Riparian corridor – The vegetative and wildlife areas adjacent to perennial and intermittent streams and other freshwater bodies.

Wildlife refuge, reserve, and scientific study area – Areas designated by public and/or owned by private agencies for the purposes of protecting, maintaining, and studying important vegetative, water, fish, and wildlife resources.

Policies

Policy 1.22a: Regulate land uses and development activities to prevent, and if infeasible, mitigate to the extent possible, significant adverse impacts on vegetative, water, fish, and wildlife resources.

Policy 1.22b: Place a priority on the managed use and protection of natural resources in rural areas of the County.

Policy 1.23: Regulate the location, density, and design of development to minimize significant adverse impacts and encourage enhancement of vegetative, water, fish, and wildlife resources.

Policy 1.24: Ensure that development will: (1) minimize the removal of vegetative resources and/or; (2) protect vegetation which enhances microclimates, stabilizes slopes, or reduces surface water runoff, erosion, or sedimentation; and/or (3) protect historic and scenic trees.

Policy 1.25: Ensure that development will: (1) minimize the alteration of natural waterbodies, (2) maintain adequate stream flows and water quality for vegetative, fish, and wildlife habitats; (3) maintain and improve, if possible, the quality of groundwater basins and recharge areas; and (4) prevent to the greatest extent possible the depletion of groundwater resources.

Under the General Plan, San Mateo County is to coordinate resource management for protection of mentioned resources with all federal, state, regional, county, and city agencies with jurisdiction in San Mateo County (Policy 1.40). It is assumed that County staff will review and comment on this EIR under this coordination requirement. Coordination is to also encourage the acquisition and management of sensitive habitats (Policy 1.41).

Soil Resource Element

Policy

Policy 2.17: Regulate development to minimize soil erosion and sedimentation, including, but not limited to, measures which consider the effects of slope, minimize removal of vegetative cover, ensure stabilization of disturbed areas, and protect and enhance natural plant communities and nesting and feeding areas of fish and wildlife.

Visual Quality Element

The Peninsula Watershed is considered a scenic view of the Junipero Serra Scenic Corridor along Interstate 280. Skyline Drive, from Highway 92 south, is also designated as a scenic corridor.

Definition

Scenic corridor – Land adjacent to a scenic road right-of-way, which, when seen from the road, provides outstanding views of natural landscapes and attractive man-made development.

Policies

Policy 4.21: Protect and enhance the visual quality of scenic corridors by managing the location and appearance of structural development.

Policy 4.41: Encourage cities to give special recognition and regulation to development in designated scenic corridors within their jurisdiction in order to support and supplement the city, county, and state network of scenic roads.

Historical and Archaeological Resources Element

Policies

Policy 5.15a: Encourage the preservation and protection of historic resources, districts, and landmarks on sites, which are proposed for new development.

Policy 5.20: Determine if sites proposed for new development contain archaeological/paleontological resources. Prior to approval of development for these sites, require that a mitigation plan, adequate to protect the resource and prepared by a qualified professional, be reviewed and implemented as a part of the project.

Park and Recreation Resources Element

The area generally east of the Upper and Lower Crystal Springs Reservoirs is part of a recreation easement. Sawyer Camp Trail is an existing bike path within the Peninsula Watershed.

Definition

Recreation easement – Land serving a range of recreation and/or preservation functions and owned by public agencies or other nonprofit organizations.

Policies

Policy 6.10: Encourage all providers to locate passive park and recreation facilities in rural areas in order to protect and preserve environmentally sensitive and open space lands.

Policy 6.14a: Encourage all providers to design sites to accommodate recreation uses that minimize adverse effects on the natural environment and adjoining private ownership.

Policy 6.14b: Encourage all providers to design, where feasible, park and recreation sites that accommodate a variety of recreational activities.

Rural Land Use Element

The Peninsula Watershed is designated as “Open Space” by the County of San Mateo and is within the County’s unincorporated rural area. The majority of the Watershed is located within the Mid-Coast Region (County General Plan region), while the southern end is within the South Coast/Skyline Region. The Watershed is not within the Coastal Zone boundary under the Local

Coastal Program developed by San Mateo County, as per the federal Coastal Zone Management Act.

Definition

Open space (rural land) – Rural land outside of Rural Service Centers (rural communities) and Rural Residential Subdivisions (clusters of residential development). Open space criteria:

- 1) Suitable for very low-density development because of hazards or conflict with surrounding resources.
- 2) Where there is managed production of resources.
- 3) Where a complementary buffer for other resource extraction or production uses is needed.
- 4) Where outdoor recreation and open space is or could be suitably provided.
- 5) Used for Watershed or other resource protection.

Policies

Policy 9.1: Provide a compatible and harmonious arrangement of land uses in the rural area by concentrating development in specific areas in order to encourage the conservation and the managed production of natural resources which meet general social and economic needs.

Policy 9.40: Wherever possible, maintain the open space character of lands designated as General Open Space through acquisition and/or performance standards for locating new development.

Policy 9.43: Recognize the San Francisco Watershed lands as unique areas of special open space significance that should be protected from conflicting land uses in order to retain their value as open space, wildlife, water supply, and recreational resources.

Transportation Element

Highway 92 is considered an arterial highway (east-west road) of Interstate 280 and Highway 1. SamTrans provides service through the Highway 92 corridor.

Definition

Highway 92 – An arterial highway connecting the major urban area east of the Santa Cruz Mountains and Montara Mountain (Bayside) with the lesser developed Coastside. Highway 92 is considered an East-West Road (County designation), important for transportation between the two areas. It is also a recreational traffic corridor.

Policies

Policy 12.2: To the extent possible, plan for accommodating future transportation demand in the County by using existing transportation facilities more efficiently, or improving and expanding them before building new facilities.

Policy 12.23: Encourage SamTrans to continue to work toward improving service levels on both local and mainline routes through reevaluation and expansion of routes, increased service to the Coastside, provision of more satellite parking facilities, and evaluation of smaller buses for local routes.

Policy 12.24: Encourage increased transit service between the Bayside and the Coastside during summer months and special events in order to help meet recreation travel demand.

Natural Hazards Element

Due to the San Andreas fault, which crosses the Peninsula Watershed, an area encompassing most of the Lower and Upper Crystal Springs Reservoirs plus the San Andreas Reservoir and the connecting streams is considered within the Special Studies Zone of the Alquist-Priolo Act. According to the General Plan, areas below the outlet of Pilarcitos Lake and San Andreas Lake are within the inundation area of a dam failure at both of these reservoirs. The larger Crystal Springs dam would also inundate an area along San Mateo Creek, which follows Crystal Springs Road. The inundation area widens as it moves out of the canyon and onto the lower bayside elevations of the City of San Mateo. Small pockets of the forested, eastern side of the Santa Cruz Mountains and Montara Mountain are considered to be areas of high landslide susceptibility. The entire Watershed is considered to be a fire hazardous area by the General Plan.

Definitions

Special Studies Zone – The purpose of the Alquist-Priolo Special Studies Zones Act is to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate the hazard of fault ruptures. Cities and counties affected by the zones must regulate certain development projects within the zones. The permitting agencies must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting.

Inundation area – Inundation of normally dry land due to dam failure.

Area of high landslide susceptibility – Non-seismic unstable condition due to landsliding.

Fire hazard – Wildland or structural fires that occur in areas that are remote, have difficult access for fire vehicles, and/or contain potentially flammable vegetative communities.

Policies

Policy 15.1: Minimize the potential risks resulting from natural hazards, including but not limited to loss of life, injury, damage to property, litigation, high service and maintenance costs, and other social and economic dislocations.

Policy 15.12d: Require detailed analysis of hazard risk and design of appropriate mitigation when development is proposed in these areas.

Policy 15.20b: Wherever possible, avoid construction in steeply sloping areas (generally above 30%).

Policy 15.20c: Avoid unnecessary construction of roads, trails, and other means of public access into or through geotechnical hazard areas.

Policy 15.27: In rural areas, consider lower density land uses that minimize the exposure of significant numbers of people to fire hazards.

Policy 15.28b: When development is proposed in hazardous fire areas, require that it be reviewed by the County fire warden to ensure that building materials, access, vegetative clearance from structures, fire flows, and water supplies are adequate for fire protection purposes and in conformance to the fire policies of the General Plan.

Policy 15.46a: Consider rural land uses that do not expose significant numbers of people to flooding hazards.

Man-Made Hazards Element

The eastern side of the Watershed near Interstate 280, the Highway 92 corridor, and Skyline Drive are within a noise impact area (60+ CNEL).

Definition

Noise impact area – Areas experiencing noise levels of 60 CNEL (community noise equivalent level) or greater.

Policies

Policy 16.11: Regulate the distribution of land uses to attain noise compatibility. Measures may include preference toward locating: (1) noise-sensitive land uses within quiet areas, removed from Noise Impact Areas, and (2) noise-generating land uses separate from noise-sensitive land uses.

Policy 16.17: Promote measures that reduce transportation-related noise, particularly aircraft and vehicle noise, to enhance the quality of life within San Mateo County.

Policy 16.18: Encourage public transportation carriers to make every feasible effort to reduce noise emissions, including, but not limited to, consideration of noise when purchasing equipment, and routing and scheduling operations.

2.0 STATE AGENCIES

2.1 CALIFORNIA DEPARTMENT OF FISH AND GAME

The California Department of Fish and Game's (CDFG) overall objective is "to maintain all species of fish and wildlife for their intrinsic and ecological values, as well as for their direct benefits to man." The Peninsula Watershed is designated as a State Fish and Game Refuge by

the CDFG. Under a Fish and Game Refuge designation, the area is considered as both a game (bird or mammal) and a fish refuge. Management of refuges are under the control and enforcement of the CDFG. The following Fish and Game Codes detail the protection of fish and game within the refuge. In addition, the Fish and Game Code includes provisions for Streambed Alteration Agreements, as discussed below.

Code 10500.

Except under a permit or specific authorization, it is unlawful:

- (a) To take or possess any bird or mammal, or part thereof, in any game refuge.
- (b) To use or have in possession in a game refuge, any firearm, bow and arrow, or any trap or other contrivance designed to be, or capable of being, used to take birds or mammals, or to discharge any firearm or to release any arrow into any game refuge.
- (c) To take or possess any species of fish or amphibia, or part thereof, in any fish refuge, or to use or have in possession in such refuge any contrivance designed to be used for catching fish.
- (d) To take or possess any bird in, or to discharge any firearm or to release any arrow within or into, any fowl refuge.

Code 10653. San Francisco Game Refuge.

In the San Francisco Game Refuge, legally possessed birds, mammals, fish, and amphibia may be carried openly by persons traveling through the refuge on public roads, between one-half hour before sunrise and one-half hour after sunset.

Code 10654. Water supply purposes.

Nothing in this division prevents the full use of the land included in the San Francisco Game Refuge for water supply purposes, nor prohibits any authorized employee of the San Francisco Water Department from carrying out such reasonable measures as may be necessary for the protection of the water supply or the prevention of pollution of the streams or reservoirs.

Code Section 1601. Streambed Alteration Agreements.

Under Section 1601 of the California Fish and Game Code, an agency or public utility proposing to substantially divert the natural flow of a stream, substantially alter its bed or bank, or use any material from the streambed, must first enter into a Streambed Alteration Agreement (SAA) with CDFG. A SAA will be required for any construction activity that would occur in a streambed or natural drainage. A SAA will only be entered into by the CDFG once all other project permits and certifications have been obtained. Construction cannot be initiated on the site until a SAA is executed. The SAA is applied for by submitting a CDFG Streambed Alteration Notification form and a nonrefundable application fee (for projects costing more than \$25,000) to the CDFG. The SAA can typically be obtained within a few months, provided proposed mitigation (as developed during the environmental review process) is acceptable to the CDFG. The CDFG, while being able to impose reasonable conditions on the agreement, may not decline to enter into

an agreement. An SAA would only be required if the proposed project resulted in impacts to waterways.

2.2 CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

The Peninsula Watershed is designated by the California Department of Forestry and Fire Protection (CDF) as a State Responsibility Area and, as such, is protected by the CDF. The CDF station nearest to the Watershed is the Belmont Station at 20 Tower Road in Belmont, approximately one mile from the center of the Watershed. Services provided by the CDF include emergency response, hazardous materials spill response, medical aid, and wildland fire suppression training. In the event of a fire emergency, CDF is the agency in charge of fire response.

The Peninsula Watershed lands have been designated as a Hazardous Fire Area by the California Department of Forestry and Fire Protection (Section 1205.4, Title 14 of the *California Code of Regulations*). As such, the area is subject to closure by the owner, as necessary or as requested by CDF, during times of high fire danger. Closures due to high fire danger typically occur periodically during fire season, from June 1st to November 1st.

2.3 U.S. DEPARTMENT OF INTERIOR, GOLDEN GATE NATIONAL RECREATION AREA – SCENIC EASEMENT AND SCENIC AND RECREATION EASEMENT

In 1969 the City of San Francisco granted two easements over the vast majority of the Peninsula Watershed to the Department of the Interior. The easements were granted to the federal government in order to obtain a change in the route (and resulting increased federal share of costs) of I-280 to a less environmentally damaging location further east of Crystal Springs Reservoir. The approximately 19,000-acre scenic easement covers the lands west of Crystal Springs and San Andreas Reservoirs. The approximately 4,000-acre Scenic and Recreation Easement applies to lands in the vicinity of I-280. The easements cover nearly all of the SFPUC-owned Peninsula Watershed lands and place restrictive covenants on use of the land which are unrelated to the SFPUC's overall management of the land for utility purposes. The Scenic Easement expressly provides that it shall not be construed to permit public access.

In 1980 Congress transferred responsibility for administration of the easements to the National Park Service–Golden Gate National Recreation Area. The legislation provides that the easements are to be administered according to the terms of the National Park Service. The Peninsula Watershed is not part of a national park or recreation area per se, as the SFPUC retains fee ownership of the land and the National Park Service has only a limited interest – it can object to development unrelated to utility management or other uses not permitted by the terms of the easements. The City is not bound by National Park Service planning mandates or procedures that Golden Gate National Recreation Area must follow. The SFPUC's Watershed management planning effort is an outgrowth of utility planning for purposes of protecting water quality and other natural resources, and is an exercise of the City's reserved rights under the terms of both easements.

The permissible boundary of public recreation activities within the Scenic and Recreation Easement are set forth in Exhibit B attached to and made a part of the Scenic and Recreation Easement (and available for inspection in the EIR file). The Scenic and Recreation Easement contemplated the possible location of an additional southern Watershed golf course. Construction of a southern Watershed golf course would be consistent with the terms of the Scenic and Recreation Easement. In June 1999, however, San Francisco Mayor Willie L. Brown, Jr. signed a resolution adopted by the San Francisco Board of Supervisors prohibiting inclusion of a new golf course on the Peninsula Watershed.

The Scenic Easement by its terms does not provide for public access to the lands west of Crystal Springs Reservoir, including the Fifield/Cahill Ridge route for the proposed Bay Area Ridge Trail. However, the City as fee owner, has retained the right to allow such access. Specifically, Section 8.c of the Grant of Scenic Easement states that the easement shall not be construed to grant to the public any right to enter the premises for any purposes. Some of the ridge trail alternatives studied in this EIR, however, propose the type of low-impact public recreation which, with proper mitigation, are consistent with the terms of the easement and compatible with water quality protection.

3.0 IMPACTS

3.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for plans and policies impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant plan or policy impact if it were to:

- substantially conflict with established regional, state or federal plans, policies, and/or guidelines with jurisdiction over the Peninsula Watershed, and as a consequence of such conflict, result in a potential adverse physical impact on the environment.

3.2 PROGRAM-LEVEL IMPACTS

Because of the broad nature of the plans and policies of jurisdictions within and adjacent to the Peninsula Watershed and the specific nature of the management actions in the *Peninsula Watershed Management Plan*, some of the management actions could be perceived to be in conflict with regional, state, and federal plans and policies, in particular the *San Francisco General Plan* and *San Mateo County General Plan* and the policies contained therein. However, potential conflict of the Management Plan with the plans and policies of jurisdictions other than the SFPUC is a policy issue and would not be considered a physical environmental impact of implementing the Management Plan.

As stated above, local planning and building laws are not applicable to the Watershed lands owned by the City and County of San Francisco. In general, potential conflicts of a proposed project or program on Watershed lands with the planning laws of other jurisdictions are considered by the decision-makers independently of the environmental review process as a part

of the decision to approve, modify, or disapprove a proposed project or program. The EIR analyzes and provides information on the potential environmental impacts of implementing the Management Plan. The information on planning laws of local jurisdictions could be used by the SFPUC and other decision-makers in assessing the extent to which the Management Plan may conflict with such laws and in making the decision to approve the proposed Management Plan or an alternative.

REFERENCES – Existing Plans and Policies

Except where indicated, references are on file at the San Francisco Planning Department.

City and County of San Francisco, *General Plan for the City and County of San Francisco*, 1995.

San Mateo County, Department of Environmental Management, Planning and Development Division, *San Mateo County General Plan*, 1986. (Available at San Mateo County Planning Department, San Mateo, California)

B. LAND USE

1.0 SETTING

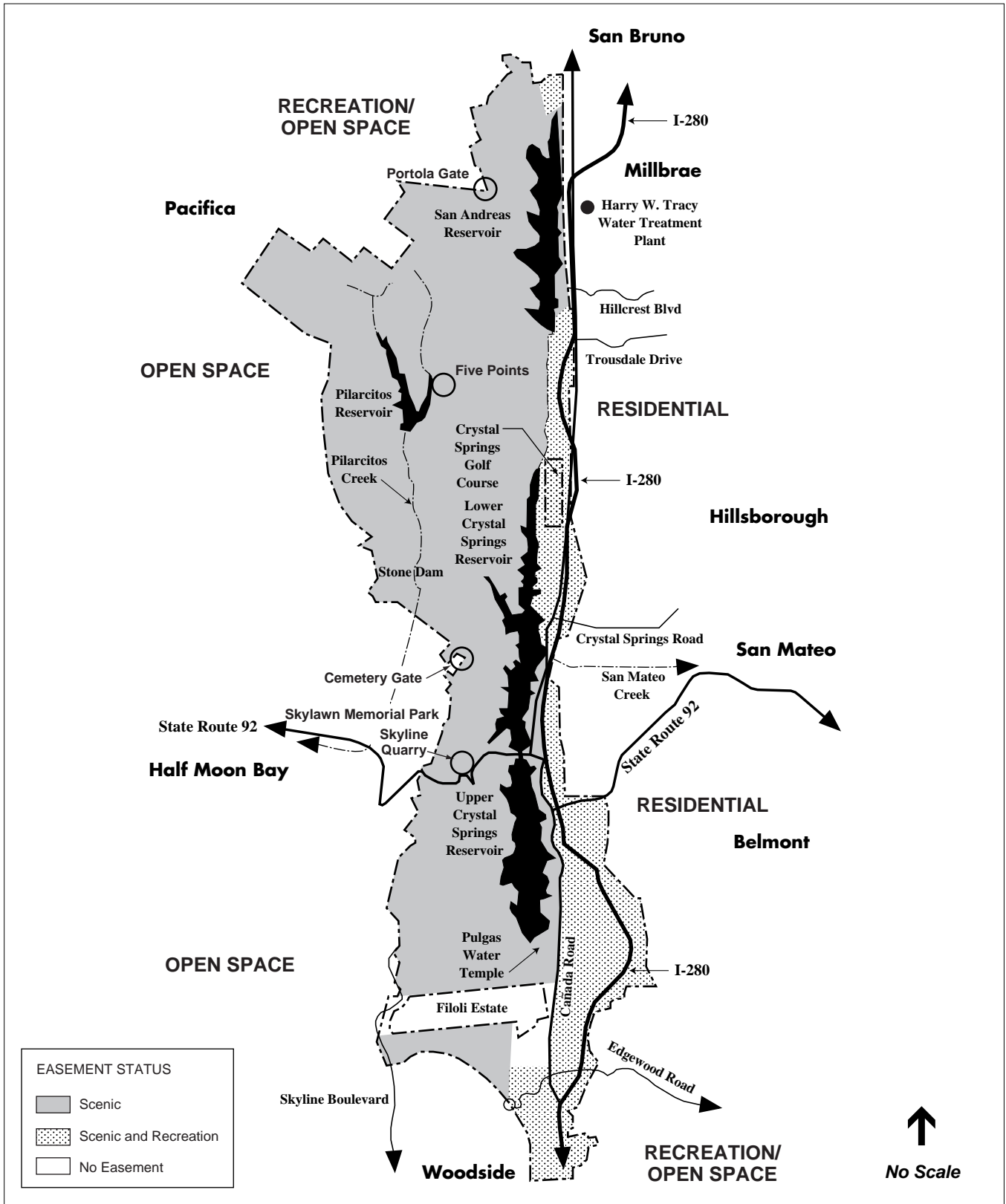
1.1 EXISTING LAND USES

The SFPUC Peninsula Watershed is used for water collection and storage, with the predominant land use being open space. Water storage facilities include the Pilarcitos Reservoir (completed in 1864), San Andreas Dam Reservoir (completed in 1870), Upper Crystal Springs Reservoir (constructed in 1877), and Lower Crystal Springs Reservoir (completed in 1890). The locations of these facilities are shown in Figure III.B-1.

In addition to existing water transmission and storage facilities, other land uses currently permitted by the SFPUC are controlled recreation (including a golf course) and the placement of utilities (including a PG&E gas main). The Peninsula Watershed lands are designated a State Fish and Game Refuge and a United Nations Biosphere Reserve, which in some cases affords additional protections for the natural resources of the Watershed. There are currently nine caretaker cottages on the Peninsula Watershed; eight are occupied by emergency response LRMS staff and one is a staff operations center.

The I-280 freeway extends in a north-south direction along the eastern margin of the Watershed. SR 92, which connects San Mateo and Half Moon Bay, bisects the Watershed between Upper and Lower Crystal Springs Reservoirs. Other roads adjacent to the Watershed include Edgewood Road to the south and Skyline Boulevard to the east. A Scenic Easement (19,000 acres) and a Scenic and Recreation Easement (4,000 acres) overlay the Watershed, as shown in Figure III.B-1. These multiparty agreements were developed in the late 1960s to preserve the Watershed as open space lands. Terms of the Scenic Easement are fairly restrictive with regards to access, whereas limited recreation activities that are compatible with water supply protection may be permitted on the Scenic and Recreation Easement. Refer to Section III.A, Existing Plans and Policies (under the heading Golden Gate National Recreation Area) for a more thorough discussion of these easements.

Surrounding land uses are generally indicated in Figure III.B-1. Land uses adjacent to the Watershed are predominantly residential to the north and east. Residential uses located along the northern and eastern Watershed boundaries are within the communities of San Bruno, Millbrae, Burlingame, Hillsborough, San Mateo, Belmont, San Carlos, Redwood City, and Woodside. Adjacent residential areas are primarily low- and medium-density residential with individual property owners. A few of these residential parcels are located within the drainage area of the Watershed. Most lands contiguous with the western and southern Watershed boundaries are in open space use (e.g., GGNRA Sweeney Ridge and San Pedro Valley County Park), except for Skylawn Memorial Park, a cemetery located adjacent to the western Watershed boundary, north of SR 92. The Filoli Estate, a 654-acre private landholding, is located in the southern portion of the Watershed. The Filoli Estate, which is open to the public, includes one historic residence, gardens, and nature trails.



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

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Figure III.B-1
 Peninsula Watershed
 Adjacent Land Uses

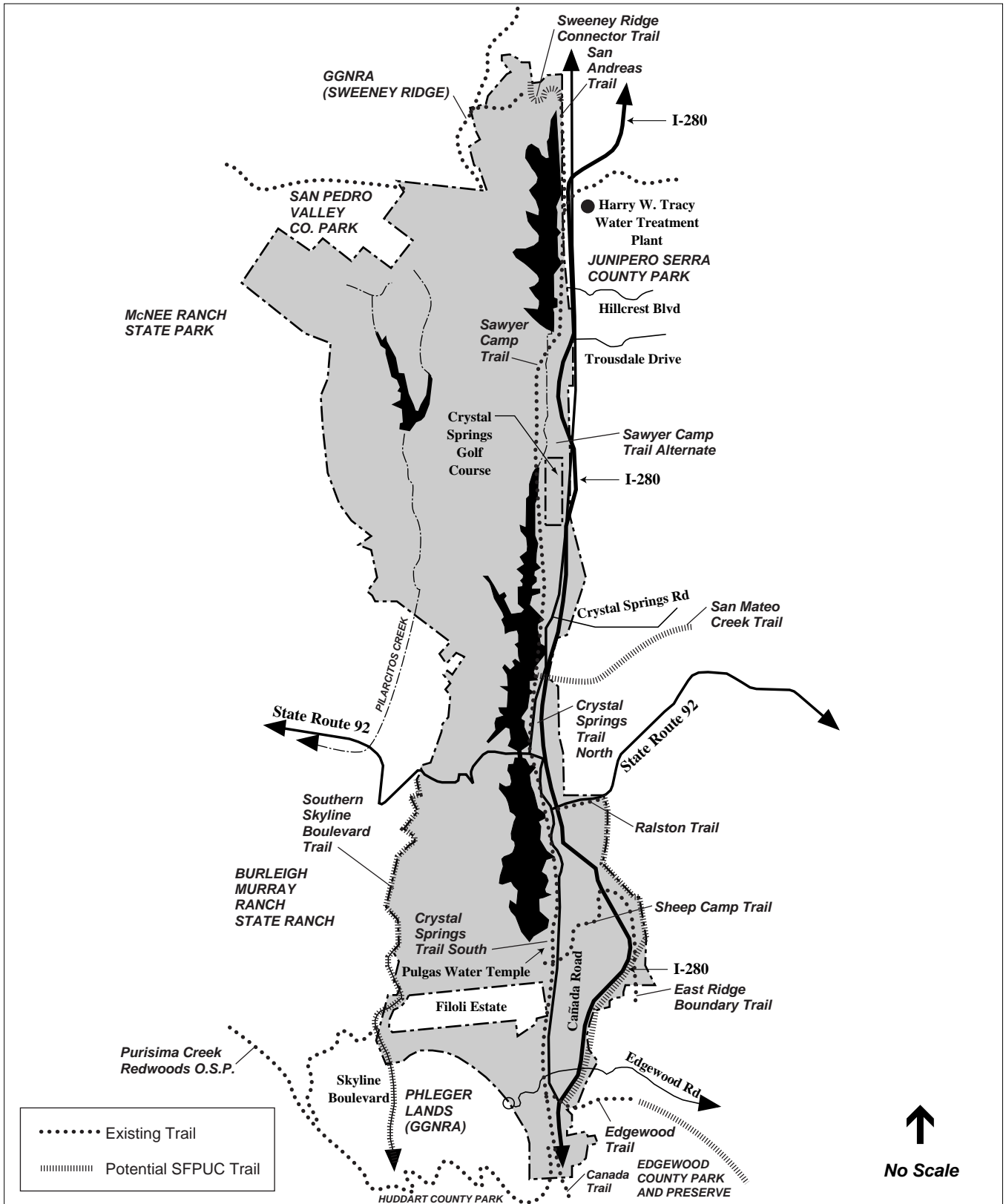
1.2 RECREATIONAL USES

Figure III.B-2 indicates the location of existing and proposed recreation opportunities in the vicinity of the Watershed. Potential trails are under consideration by both GGNRA and San Mateo County and may not be compatible with Management Plan objectives. Existing recreational uses within the Watershed are limited to those deemed to be compatible with water quality protection and are located in the eastern periphery of the Watershed, generally along the I-280 corridor and adjacent to communities to the east. Public trails on the Watershed are currently available to the public for hiking, running, bicycling, rollerblading, and horseback riding. Public trails are generally located along the eastern edge of the Watershed where they are easily accessible from the adjacent communities. Major trails, which form a near-continuous north-south link, include San Andreas Trail, Sawyer Camp Trail, and Crystal Springs Trail. These trails are located generally between the reservoirs and I-280. Approximately 200,000 visitors per year use the Sawyer Camp Trail. There are also numerous connector trails that cross I-280 and provide linkages to communities to the east such as San Mateo, Belmont, and Redwood City. Horseback riding and bicycles are currently allowed only on certain designated trails.

There is currently one golf course on the Peninsula Watershed – the 18-hole Crystal Springs Golf Course. It is located immediately west of I-280, between Lower Crystal Springs Reservoir and San Andreas Reservoir.

Recreational uses adjacent to the Watershed include the following:

- Sweeney Ridge (1,000 acres) – National Park Service (GGNRA) lands adjacent to the northwestern Watershed boundary; mostly undeveloped with some hiking trails.
- Junipero Serra County Park (108 acres) – San Mateo County park located east of the northeastern Watershed boundary; developed with picnic areas and hiking trails. Two planned trails (Crystal Springs Spur Trail and San Francisco Watershed Trail) are proposed by San Mateo County to connect with existing trails (Sawyer Camp Trail and San Andreas Trail, respectively) in the Watershed.
- San Pedro Valley County Park (1,150 acres) – San Mateo County park adjacent to the northwestern Watershed boundary; developed with six miles of hiking trails, picnic areas, and nature trails.
- Pulgas Ridge Open Space Preserve (293 acres) – Mid-Peninsula Open Space District lands located east of the southeastern Watershed boundary; developed with hiking and equestrian trails.
- Edgewood County Park (290 acres) – San Mateo County park adjacent to the southeastern Watershed boundary; developed with hiking and equestrian trails. Edgewood Trail within the park connects with the Watershed's Crystal Springs Trail South, which is also maintained by the County of San Mateo.
- Phleger Estate (600 acres) – National Park Service (GGNRA) lands (newly purchased) adjacent to the southern Watershed boundary with over five miles of hiking trails accessible from the adjacent Huddart County Park.



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

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Figure III.B-2
Existing and Potential Recreational Use in the
Peninsula Watershed Area

- Huddart County Park (974 acres) – San Mateo County park located immediately south of Phleger Estate, south of the Watershed boundary; developed with 15 miles of hiking and equestrian trails, playground, and archery range. This park is connected with the Watershed through the cross-boundary Crystal Springs Trail.
- Purisima Creek Redwoods Open Space Preserve (2,633 acres) – Mid-Peninsula Open Space District lands west of Huddart Park and the southwestern Watershed boundary; developed with 20 miles of hiking and equestrian trails, as well as picnic areas.
- Burleigh H. Murray Ranch State Park (1,128 acres) – California state park located adjacent to the southwestern Watershed boundary; undeveloped, with some hiking trails.

San Mateo County has developed a countywide Trails Plan (1995) that presents potential connector trails to the three Bay Area regionwide trail systems: the Bay Trail, which circles the Bay’s shoreline; the Bay Area Ridge Trail; and the Coastal Trail, which runs along the Pacific Ocean shoreline. The Trails Plan proposes connector trails between points on the trail systems and other County trails in County parks, open space preserves, public lands, and private lands, including the Peninsula Watershed. A Draft EIR for the Trails Plan was released in October 1999. Specific alignments are not proposed nor have any agreements been established with other agencies, such as for right-of-ways on SFPUC-owned Watershed lands. In addition to these potential trails, other planned trail projects include the Crystal Springs Spur Trail and San Francisco Watershed Spur Trail (Junipero Serra County Park to the Watershed), the Sweeney Ridge Connector Trail, and the ongoing Crystal Springs Trail North connecting Sawyer Camp Trail with Crystal Springs Trail South.

1.3 INCOMPATIBLE USES

A number of SFPUC regulations prohibit the following activities in the Watershed:

- 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, animals, firewood, cultural resources);
- Release of domestic animals;
- Smoking;
- Littering;
- Alcohol;
- Unauthorized fires;
- Hunting (except to control pest species and feral animals); and
- Fishing.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for land use impacts, but it generally considers that the implementation of the *Peninsula Watershed Management Plan* would have a significant effect on land use if it were to:

- substantially disrupt or divide the physical arrangement of an established community;
- substantially conflict with established recreational, educational, religious, or scientific uses; or
- have a substantial impact on the existing character of the vicinity.

Land use impacts are evaluated with respect to compatibility of the proposed project with the existing land uses and the potential effect the proposed policies and actions would have on land use patterns in the project vicinity.

2.2 PROGRAM-LEVEL IMPACTS

Potential programmatic land use impacts associated with actions that would increase public use are discussed in this section and, when measured against the significance criteria, were determined to be less than significant. Increased public use associated with the proposed Fifield/Cahill Ridge Trail is discussed at a project-level in Chapters V and VI of this document.

Increased Public Access and Use

Access to Public Use Areas

Implementation of the *Peninsula Watershed Management Plan* would increase public access into portions of the Watershed where public access is currently allowed. The intention of the Management Plan is to provide for the continuation of existing uses on public trails, and to provide for the establishment of some new trail access. Implementation of the Management Plan would increase public use of the Watershed through development of new public trails (Action tra2 and Policies WA15.2 and WA15.4) and other public facilities, such as a Watershed Visitor Education Center (Actions pub3 and pub4).¹ In addition, the Management Plan calls for provision of universal access to recreation facilities and trails, which could increase public use of the Watershed (Action des8). New trails are planned for the eastern edge of the Watershed, within the Scenic and Recreation Easement (Figure III.B-2). New trails would be restricted to areas of low vulnerability and risk in order to protect water quality and sensitive ecological resources (Policy WA13). The Management Plan would give priority to trails that provide

¹ It is noted that Watershed Activities Policy 22 states, in part, that proposals for new facilities, structures, roads, trails, projects and leases, or improvements to existing facilities shall be limited to essential public services and shall not be attractions unto themselves, but incidental to the primary purposes of the Watershed and to its enjoyment and conservation in its natural condition. The Watershed Visitor Education Center may or may not be built, depending on funding and priorities; no site has been chosen and further site-specific environmental analysis would be required when a specific development proposal were made.

connections to urban areas and trails of other agencies. These trails would allow for general public access. In particular, the intent is to complete a north-south connector through the Watershed by linking existing trails along the eastern edge of the Watershed to new trails located in zones of lesser vulnerability and risk that would require little new trail construction.

Under the Management Plan, a new trail, known as Alternative A/B: Programmatic Skyline Boulevard Alignment, could be built along Skyline Boulevard between SR 92 and the Kings Mountain Trail, along the southwestern Watershed boundary (Action tra2). This trail is associated with unrestricted access alternatives for the proposed Fifield/Cahill Ridge Trail. It would not be built if docent-led or access by annual permit alternatives were implemented. Provided the new trail were located adjacent or very close to Skyline Boulevard, there would be no significant land use impacts. The new trail would not disrupt or divide established surrounding uses nor would it be incompatible with existing residential and recreational uses in the areas adjacent to Skyline Boulevard.

Development of new trails under the Management Plan and changes in equestrian access could result in increased use of the Watershed by equestrians and bicyclists. Bicyclists are currently allowed on public trails and would continue to be allowed on designated existing and new public trails under the Management Plan. Equestrians are allowed on internal trails within the Watershed and pay an annual permit fee for use of these trails. The Management Plan would revoke the permit system for equestrians, potentially providing the same access rights to existing and new public trails as other Watershed visitors (i.e., access to designated public trails, future additions to the public trail system, and new trails that would be open to the general public). Equestrian use of the Watershed would likely increase in proportion to population increases and demand for recreation uses. Equestrian use would also shift from internal trails to trails open to the general public.

Access to existing internal roads and fire roads is currently allowed only by permit for groups (limited in size) led by qualified volunteer leaders or SFPUC staff person. With the possible exception of access to the Fifield/Cahill Ridge service road (described in Chapter V as the Fifield/Cahill Ridge Trail project), this practice would be maintained under the Management Plan (Policy WA10).

When evaluated in terms of the significance criteria outlined above, increased public use of the eastern edge of the Watershed would not disrupt or divide the physical arrangement of established surrounding uses. Areas adjacent to the eastern edge of the Watershed are developed with residential and recreational uses, and the proposed recreational use would be compatible with such uses. Proposed trails would connect with existing trails and would not alter the land use character in the vicinity. Therefore, implementation of the Management Plan would not directly result in any significant land use impacts. However, increased human activity within the Watershed would increase the fire risk, which in turn could adversely affect existing water quality, natural resources, air quality, cultural resources, and long-term recreation potential (for more discussion refer to Sections III.D, Hydrology and Water Quality; III.E, Natural Resources; III.F, Air Quality; III.G, Fire Management; and III.H, Cultural Resources). The San Francisco

Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Science and Educational Uses

Scientific study is currently allowed by permit only, and the Management Plan would continue this practice with the goal of furthering the understanding of the Watershed’s resources and biodiversity (Policy WA11). The Management Plan considers the development of a Watershed Visitor Education Center (Action pub4) that would provide docent-led activities and other educational activities (such as docent training). The center could also serve as a day-use picnic area. Management Plan implementation would not conflict with established educational or scientific uses, nor would development of the Visitor Education Center be expected to affect the existing land use character in the Watershed vicinity.

Incompatible Uses

The incompatible uses listed under Section 1.3, above, would continue to be prohibited under the *Peninsula Watershed Management Plan*. The Management Plan also prohibits other activities that are detrimental to Watershed resources, such as new golf courses and expansion of existing golf courses.

The current policy that prohibits fishing would be continued under the Management Plan (Policy WA1). Fishing is not allowed on the Peninsula Watershed due to water quality concerns and requirements of the State Fish and Game Refuge. All water edges within the Watershed are included in the high water quality vulnerability zone, as defined by the Management Plan, and are very susceptible to erosion that could be caused by fishing along streams and reservoirs. In addition, fishing could cause damage to wildlife habitat, impact sensitive plant and animal species, and result in water quality impacts (associated with litter, bacterial contamination, and shoreline disturbance).

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C. GEOLOGY AND SOILS

1.0 SETTING

1.1 TOPOGRAPHY AND GEOLOGY

The SFPUC Peninsula Watershed is located within the natural region of California referred to as the Coast Ranges geomorphic province. This province is geologically complex and seismically active and is characterized by northwest-trending faults, mountain ranges, and valleys. The Peninsula Watershed lies within the northwest-trending Santa Cruz Mountains that extend the length of the San Francisco Peninsula.

The western boundary of the Watershed lands generally coincides with the topographic drainage divide, which is made of distinct, high ridgelines. The northwestern boundary of the Watershed is marked by Sweeney Ridge and extends southwest to Whiting Ridge. From Whiting Ridge, the western boundary extends roughly southeast along the prominent ridgeline of Montara Mountain and then continues south along Cahill Ridge. The eastern Watershed boundary follows Buri Buri Ridge and Pulgas Ridge on the eastern side of Crystal Springs Reservoir and San Andreas Reservoir.

The topography of the Peninsula Watershed is dominated by the northwest-trending rift valley of the San Andreas fault and several northwest-trending ridges. The terrain is generally rugged. Elevations in the Watershed range from about 300 feet above mean sea level (msl) along the shoreline of Crystal Springs Reservoir, to about 1,900 feet above msl at the crest of Montara Mountain (at North Peak and Scarper Peak), and to over 2,000 feet near Kings Mountain. West of the San Andreas fault, steep valley side slopes with flat-topped ridges are the dominant pattern, while more rounded, rolling topography exists southeast of the fault. Slopes in the northern portion of the Watershed are somewhat steeper than slopes in the southern portion. Slopes in the northern portion of the Watershed have average gradients ranging from about 3:1 (horizontal to vertical ratio) to 1:1; slopes in the southern portion of the Watershed have average gradients ranging from about 5:1 to 3:1. Slopes within the valleys, minor drainages, and along ridgetops are gentler.

The San Andreas fault, in combination with the Pilarcitos fault to the west, marks the boundary between two distinct geologic sequences. In the northern portion of the Watershed, the Cretaceous (about 65 to 135 million years old) granite of Montara Mountain and Tertiary (about 2.5 to 65 million years old) sedimentary deposits of sandstone, shale, and conglomerate occur west of the Pilarcitos fault. In the southern portion of the Watershed, Tertiary Butano Sandstone composed of sandstone with minor amounts of shale and conglomerate occurs west of the San Andreas fault.

The Jurassic (135 to 190 million years old) to Cretaceous Franciscan complex occurs east of the San Andreas and Pilarcitos faults. Within the Watershed, this assemblage includes greenstone (altered basalt, and other volcanic rocks), sandstone, limestone, chert, and sheared deposits

consisting of sedimentary, metamorphic, and volcanic rocks surrounded by clay materials. Serpentine, an alteration product of ultramafic rocks (those containing high concentrations of magnesium and iron), is commonly associated with the Franciscan complex, along shear zones and faults. Within the Watershed, serpentine is distributed erratically among the rocks of the Franciscan complex.

Quaternary (less than 2.5 million years old) surficial deposits within the Watershed include alluvium (stream deposits), colluvium (loose soil materials and/or rock fragments deposited by rainwash or downslope creep), artificial fill, and landslide deposits. The alluvial and colluvial deposits are concentrated in the valleys adjacent to San Andreas and Crystal Springs Reservoirs and in tributary valleys and ravines. Colluvium is also present to varied depths throughout the Watershed on the upland slopes. Artificial fill is found near San Andreas and Crystal Springs Reservoirs and along developed (paved) roads and highways that traverse the Watershed (Pampeyan, 1994).

1.2 SOILS AND EROSION

The soils in the Watershed generally reflect the underlying geology, with variations related primarily to slope position. West of the Pilarcitos fault, soils in areas underlain by granitic rocks generally consist of the Miramar-Sheridan association, and soils in areas underlain by sedimentary rocks generally consist of the Lobitos-Santa Lucia-Gazos association. These soils generally drain well, range in depth from shallow to deep, and can be highly erosive. East of the Pilarcitos fault, in areas underlain by the varied rocks of the Franciscan complex and the Butano Sandstone, soils generally consist of the Alambique-McGarvey, Barnabe-Candlestick-Buriburi, Fagan-Obispo, and Alambique-Zeni-Zeni Variant associations. These soils also drain well, range in depth from shallow to deep, and can be highly erosive (Environmental Science Associates, 1994).

Several soil mapping units in the Pilarcitos basin have experienced significant topsoil erosion. These areas are particularly sensitive to further loss of the topsoil due to limited soil depth, water holding capacity, and fertility. Soil erosion hazard is a measure of the susceptibility of a soil to erosion by sheet wash, rilling, or gullyng, and is independent of existing erosion status. Numerous soil types throughout the Peninsula Watershed have a high potential for soil erosion. Many soil units on slopes with gradients exceeding 3:1 have severe erosion hazard regardless of parent material.

1.3 SLOPE STABILITY

Slope stability is an issue that affects most of the Watershed, ranging from dispersed small landslides and moderate susceptibility to failures to large old landslides that have high susceptibility to reactivation. Numerous small to moderate (less than 500 feet long) landslides have occurred within the Watershed, especially along Pilarcitos Creek (Brabb and Pampeyan, 1972). Several large (over 500 feet long) slides are also present, including a major slide on the flank of Montara Mountain adjacent to Pilarcitos Creek and near I-280 in the southernmost portion of the Watershed. Most of the slopes within the Watershed were classified as Category 3

(generally stable to marginally stable) and Category 4 (moderately unstable) in a regional assessment of slope stability within the San Francisco Bay region (Nilsen et al., 1979). A relatively small number of the slopes have been classified as Category 2 (generally stable) or Category 5 (unstable).

Most of the large individual landslides are located along fault zones and ridgelines. The distribution of landslides is also related to the type of rock. The largest individual landslides are associated with contact between the granite and sedimentary rocks along Pilarcitos Creek, Butano Sandstone along the San Andreas fault, and in Franciscan sheared rocks east of the main fault zone. Several factors affect the susceptibility of slopes to static or seismically induced slope failures, including variables such as moisture conditions and the characteristics of a particular earthquake event.

1.4 FAULTS AND SEISMICITY

Table III.C-1 lists the faults located in the vicinity of the Peninsula Watershed, and Figure III.C-1 indicates the location of the primary regional active faults. The major structural feature in the region is the northwest-trending San Andreas Fault Zone.¹ This fault zone forms the boundary between two major tectonic plates (the North American and Pacific plates). Past movement along this fault (several hundred miles over many millions of years) has brought together two distinct groups of rocks. Rocks to the west of the fault are generally younger and less deformed than rocks to the east of the fault. The San Andreas Fault Zone traverses the length of the Watershed and has formed the structural valley in which Crystal Springs and San Andreas Reservoirs are located.

In addition to the San Andreas Fault Zone, other active and potentially active faults are within and near the Watershed. Construction or establishment of permanent activities should consider the following: the Pilarcitos fault (a Quaternary fault), which could affect slopes in the Pilarcitos basin; the Serra fault and other Late Quaternary faults on the eastern margin of the Watershed; and the San Mateo fault (presumed pre-Quaternary), whose activity status is unknown.

Other major active regional faults with the potential to affect the Watershed include the San Gregorio, Hayward, and Calaveras faults (Table III.C-1). The San Gregorio fault is about five miles west of the Watershed, while the Hayward and Calaveras faults are about 18 and 25 miles east of the Watershed, respectively.

1.5 SEISMIC HAZARDS

The San Andreas fault dominates the seismic setting of the Watershed. An Alquist-Priolo Special Studies Zone surrounds the San Andreas fault through the length of the Watershed, as well as the Cañada fault (a branch fault that joins the San Andreas fault in the southernmost portion of the Watershed). The Alquist-Priolo Special Studies Zones Act requires the state to identify zones

¹ A fault zone consists of a major fault trace and includes secondary fractures originating from this fault.

**TABLE III.C-1
FAULTS IN THE VICINITY OF THE PENINSULA WATERSHED**

Fault Zone	Relative Location	Recency of Faulting^a	Historical Seismicity^b	Maximum Moment Magnitude^c
San Andreas Peninsula	within Watershed	Historic	M 7.1; 1989 M 8.25; 1906 M 7.0; 1838 Many <M 6	7.1
San Gregorio (Seal Cove)	5 miles southwest	Holocene; Late Quaternary	Many M 3-6.4	7.3
Hayward	18 miles east	Historic	M 6.8; 1868 M 7.0; 1838 Many <M 4.5	6.9
Calaveras	25 miles east	Historic	M 6.1; 1984 M 5.9; 1979 Many <M 6.5	6.8
Serra	1 mile east	Quaternary	na	na
Pilarcitos	within Watershed	Quaternary	na	na
San Mateo	within Watershed	Unknown Pre-Quaternary?	na	na

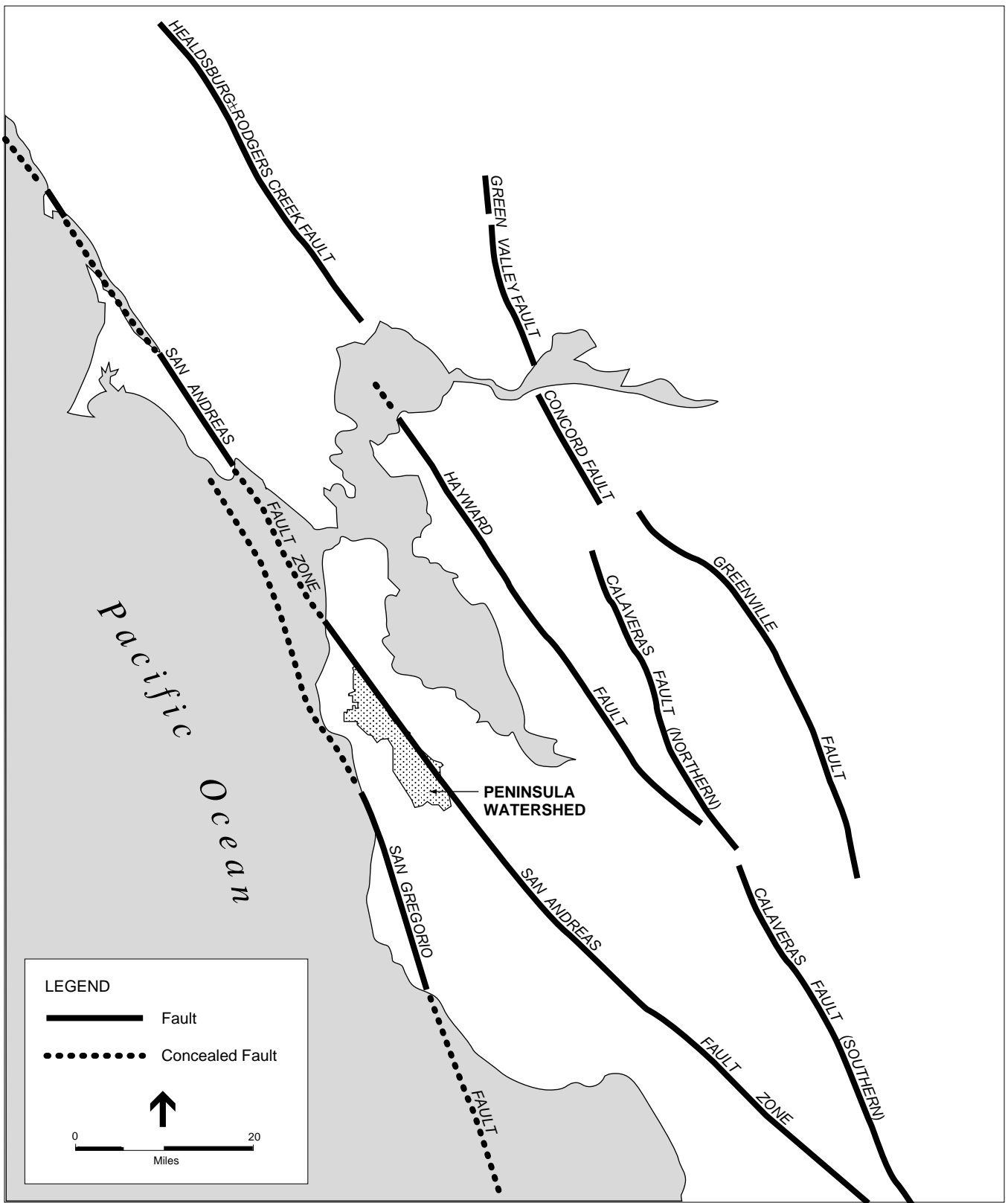
^a Recency of faulting based on Jennings, 1994. Historic: displacement during historic time (within last 200 years), including areas of known fault creep; Holocene: evidence of displacement during the last 10,000 years; Quaternary: evidence of displacement during the last 1.6 million years; Pre-Quaternary: no recognized displacement during the last 1.6 million years (but not necessarily inactive).

^b Richter magnitude (M) and year for recent and/or large events.

^c The Maximum Moment Magnitude is an estimated magnitude for a “characteristic” earthquake capable of occurring on a fault. Moment magnitude is directly related to average slip and rupture fault area, while the Richter magnitude scale reflects the amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event.

na = Not applicable and/or not available.

SOURCES: Jennings, 1994; Peterson, et al., 1996.



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SOURCE: Environmental Science Associates.

Figure III.C-1
Principal Active Regional Faults
of the San Francisco Bay Area

around “active” faults (those having evidence of surface displacement within about the last 11,000 years) in which special geologic studies are required prior to development. Development across or near the surface trace of active faults is regulated to reduce the potential hazards from surface ground-rupture.

The major secondary seismic hazard of potential concern within the Watershed is seismically induced landsliding. Seismically induced landslides generally occur in areas already susceptible to landslides due to other factors, including the presence of old landslide deposits. Earthquakes may trigger landslides that might not otherwise occur until a later time.

1.6 MINERAL RESOURCES

Historically, mineral resources of the Watershed have been extracted for commercial off-site use and as a source of local roadbed material. Skyline Quarry, located within the Watershed north of SR 92, is a former commercial aggregate quarry that is now inactive. No reclamation of the site has occurred; the open quarry is currently used as a storage yard and for police activities (see Section III.M). A small active quarry exists on Spring Valley Ridge directly north of Pilarcitos Reservoir. The quarry was used as a source of road-building material first by the Spring Valley Water Company, and then by SFPUC.

Significant aggregate mineral resources have not been identified by the California Division of Mines and Geology (DMG) within the SFPUC lands, although selected geologic units within the Watershed are similar to rock units identified as significant on adjacent lands. Since these areas have not been classified by the DMG, land use decisions for the potential resource areas would not be required to comply with state codes designed to protect identified areas. However, abandoned and previously active mines and borrow pits exist on the SFPUC property for which no reclamation has been conducted (Environmental Science Associates, 1994). As quarry operations ceased on this site before 1975, reclamation compliance with the Surface Mining and Reclamation Act (SMARA) of 1975 is not required for this area. Nonetheless, the Management Plan includes reclamation actions for this area under the vegetation and soil management actions of the Management Plan.

1.7 REGULATORY FRAMEWORK

The area along the San Andreas (and Cañada) Fault Zone is designated as a special studies zone under the Alquist-Priolo Act. The Alquist-Priolo Special Studies Zones Act (1972), as codified in the California Public Resources Code, regulates development near active faults, with the purpose of mitigating the hazard of surface fault-rupture. The principal focus of the legislation is to prohibit the location of developments and structures for human occupancy across the trace of active faults as defined by the State Geology Board. Regulation would require specialized geologic reports defining and delineating surface fault rupture hazards prior to undertaking projects that would include structures for human occupancy.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for geology and seismicity impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant geologic or seismic impact if it were to:

- expose people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards;
- cause substantial flooding, erosion, or siltation;
- change topography or ground surface relief features; or
- substantially modify any unique geological or physical features.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of *Peninsula Watershed Management Plan* actions on the geology and soils of the Watershed, including the following types of impacts:

- Soil erosion;
- Reduced slope stability; and
- Exposure to seismic hazards.

Soil Erosion

Erosion of surficial soil within the Watershed property could occur from direct exposure to wind, water, and physical disturbance. Soil erosion can potentially present ground stability and water quality problems. Development of new hiking trails, bicycle routes, equestrian trails, and service roads or intensifying these uses on existing trails would increase the likelihood of erosion in the Watershed and sedimentation in stream channels and reservoirs. Construction activities associated with new trail routes or structures would also increase both short- and long-term potential for erosion. Actions that could directly or indirectly result in soil erosion include introduction of facilities that could increase public visitation of the Watershed by providing new trails (Policies WA15.2 and WA15.4 and Action tra2), increased information (such as maps and brochures) regarding public activities available on the Watershed, or additional public activity destinations. These facilities include information kiosks (Action pub3) and a Watershed Visitor Education Center (Action pub4). In addition, implementation of Action des8 would result in universal access improvements at existing Watershed facilities and trails.

Potentially significant soil erosion may also occur as a result of the relocation of fire and maintenance roads or development of roads or trails at Watershed facilities, as described above. In addition, soil erosion may occur during construction of new Watershed facilities. Although many facilities would be installed to ensure and/or improve water quality or resource protection on the Watershed, their installation and maintenance could increase areas vulnerable to erosion,

such facilities include barriers or fences along reservoir edges, dams, and identified high-risk spill potential areas (Actions haz4 and haz8); barriers on Upper Crystal Springs Dam (Action haz9); infiltration drainfields and detention basins (Action sto1); and long-term sediment retention basins and other permanent measures (Action aqu12). Furthermore, rehabilitation of shoreline areas and stream segments (Actions aqu5 and aqu7) and the relocation or reconfiguration of existing roads (Action fir7) to improve emergency access could also increase areas vulnerable to erosion.

Typically, vegetative cover reduces the erosive energy of rainfall and promotes infiltration of rainwater. In addition, plant root systems help stabilize soil horizons below the surface. With the removal of vegetative cover, water tends to wash downslope, eroding soil as flows increase. Policies 15.2 and 15.4 and Action tra2 call for the addition of new trails and new trail connections that would introduce additional people into the Watershed. These actions would increase the risk of fire hazard (see Section III.G) and also could significantly increase soil erosion. An indirect effect of any fire (large or small) can be increased soil erosion, and a large fire over a steep area of the Watershed could result in significant impacts in terms of soil loss. Increased erosion due to vegetation loss following fire events could have detrimental effects on water quality and slope stability.

Actions to reduce the threat of fire hazards through fuel reduction (Action fir8) or to enhance wildlife habitat (Actions con4 and wil7) could ultimately result in soil erosion. The extent of this erosion would depend on the techniques used and the extent of plant and root-system removal. Some fuel reduction practices are not as severe, such as mowing and pruning. Erosion from this kind of fuel reduction would be less severe than that from a large prescribed fire.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Table III.C-2 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented. Not every bolded action would be necessary to mitigate the effects of the associated potential impact-causing management action. For example, a very minor structure such as a kiosk located in an environmentally non-sensitive area may not require any of the bolded actions to avoid a significant effect. Because implementation information, such as locations of specific facilities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

**TABLE III.C-2
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS
THROUGH INCREASES IN SOIL EROSION**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
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 the Management Plan.	Actions roa1, roa2 , roa3, roa4, roa7, roa12 , veg4 , veg9 , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and to the trail facilities of other agencies and which help to complete a continuous north-south public trail along the eastern edge of the Watershed.	Actions roa1, roa2 , roa3, roa4, roa7, roa12 , veg4 , veg9 , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action tra2: Provide a southern extension to the Fifield/Cahill Ridge Trail.	Actions roa1, roa2 , roa3, roa4, roa7, roa12 , veg4 , veg9 , fir2, fir3, fir4, fir5, fir6, fir7, and des5.	LTS
Action pub3: Establish “gateway” information kiosks at major entryways to the Watershed.	Actions veg4 , veg9 , and des5.	LTS
Action pub4: Establish a Watershed Visitor Education Center with an adjacent loop trail.	Actions roa1, roa2 , roa3, roa4, roa7, roa12 , veg4 , veg9 , and des5.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions roa1, roa2 , roa3, roa4, roa7, roa12 , veg4 , veg9 , and des5.	LTS
Action haz4: Install barriers or fences to prevent access to reservoir edges and dams.	Actions veg4 , veg9 , and des5.	LTS
Action haz8: Identify high-risk spill potential areas and implement measures (e.g., barricades).	Actions veg4 , veg9 , and des5.	LTS
Action haz9: Install barriers on Upper Crystal Springs Dam.	Actions veg4 , veg9 , and des5.	LTS
Action stol: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, or detention basins.	Actions veg4 , veg9 , and des5.	LTS
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Actions veg4 , veg9 , and des5.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.C-2 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS
THROUGH INCREASES IN SOIL EROSION

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection measures.	Actions veg4 , veg9 , and des5.	LTS
Action aqu7: Rehabilitate stream segments.	Actions veg4 , veg9 , and des5.	LTS
Action fir7: Identify and construct road improvements (turnouts, turnarounds) to provide better access.	Actions roa1, roa3, roa12 , and veg9 .	LTS
Action fir8: Complete fuel management projects listed in the Management Plan and the Fire Management Element.	Actions fir14 , and veg5 .	LTS
Action con4: Use prescribed fire in areas subject to brushy encroachment.	Actions fir14 , and veg5 .	LTS
Action wil17: Create palatable re-sprouting through mechanical treatments or prescribed fire.	Actions fir14 , and veg5 .	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

The most important means of reducing soil erosion impacts are actions that relocate high erosion-potential roads (Action **roa2**) and design practices that establish guidelines and best management practices (BMPs) for new roads and facilities (Action **roa12**). Action **veg4** also greatly reduces soil erosion impacts by requiring that a grading plan be prepared prior to the initiation of any construction project. Action **veg9** is also crucial, as it requires that operation, maintenance, and new construction follow erosion-control BMPs. In terms of minimizing impacts that might occur due to loss of vegetative cover through fuel management, Actions **fir14** and **veg5** are crucial for establishing restoration requirements and monitoring.

In addition, the Management Plan includes additional actions that would further reduce the impacts of soil erosion, when implemented with the important actions discussed above. Actions **roa1**, **roa3**, **roa4**, and **roa7** provide guidelines for modifying existing roads and siting new roads to minimize soil erosion. Action **des5** provides design guidelines for roads, trails, and facilities specifically with respect to grading. Finally, to reduce impacts from potential fire damage, Actions **fir2** through **fir7** apply to improving fire pre-suppression and fire response so as not to increase vegetative cover loss and the associated increased soil erosion.

Implementation of design guidelines, and vegetation protection and restoration activities, as described above and in Section IV.C, would reduce potential soil erosion impacts associated with the Management Plan to a less than significant level. The impacts of day-to-day management activities that implement the Management Plan are analyzed in this EIR and generally would not be subject to further environmental review. No unavoidable significant program-level soil erosion impacts have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Reduced Slope Stability

Slope instability leading to landslides would continue to occur within the Watershed. However, under the Management Plan, public access to areas susceptible to landsliding could be increased by the addition of new trails (Policies WA15.2 and WA15.4, and Action **tra2**). Increased road and trail building and increased public use could reduce slope stability in certain areas.

Table III.C-3 links, at a program-level, those management actions that could result in potential impacts on slope stability with the full range of actions that could be required to reduce the potential physical effects. Under the Management Plan, the most important means of reducing potential slope instability and landsliding is Action **veg10**, which calls for identifying areas of slope instability and failure and employing BMPs to prevent further erosion. Action **roa12** is also important, as it calls for the designing, siting, and constructing new roads and trails according to specific guidelines and BMPs for location and alignment. Implementation of these actions, as described above and in Section IV.C, would reduce the potential for slope instability and landsliding to a less than significant level.

**TABLE III.C-3
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
GEOLOGY AND SOILS DUE TO REDUCED SLOPE STABILITY**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
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 the Management Plan.	Actions veg10 and roa12 are required to reduce this impact.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and to the trail facilities of other agencies and which help to complete a continuous north-south public trail along the eastern edge of the Watershed.	Actions veg10 and roa12 are required to reduce this impact.	LTS
Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.	Actions veg10 and roa12 are required to reduce this impact.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

Exposure to Seismic Hazards

Fault rupture associated with seismic activity on the San Andreas fault and groundshaking caused by the other active regional faults is an unavoidable occurrence within the Watershed lands. Increased public activity in the Watershed would expose more people and facilities to the hazards of a seismic event, including landsliding and liquefaction. It is not possible to predict whether seismically induced landsliding would be limited to certain portions of the Watershed, such as areas along or near active faults, or would be more broadly distributed. Given the relatively small additional number of people who might experience exposure to seismic hazards while in the Watershed, seismic hazards as a result of groundshaking and fault rupture are considered less than significant.

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D. HYDROLOGY AND WATER QUALITY

1.0 SETTING

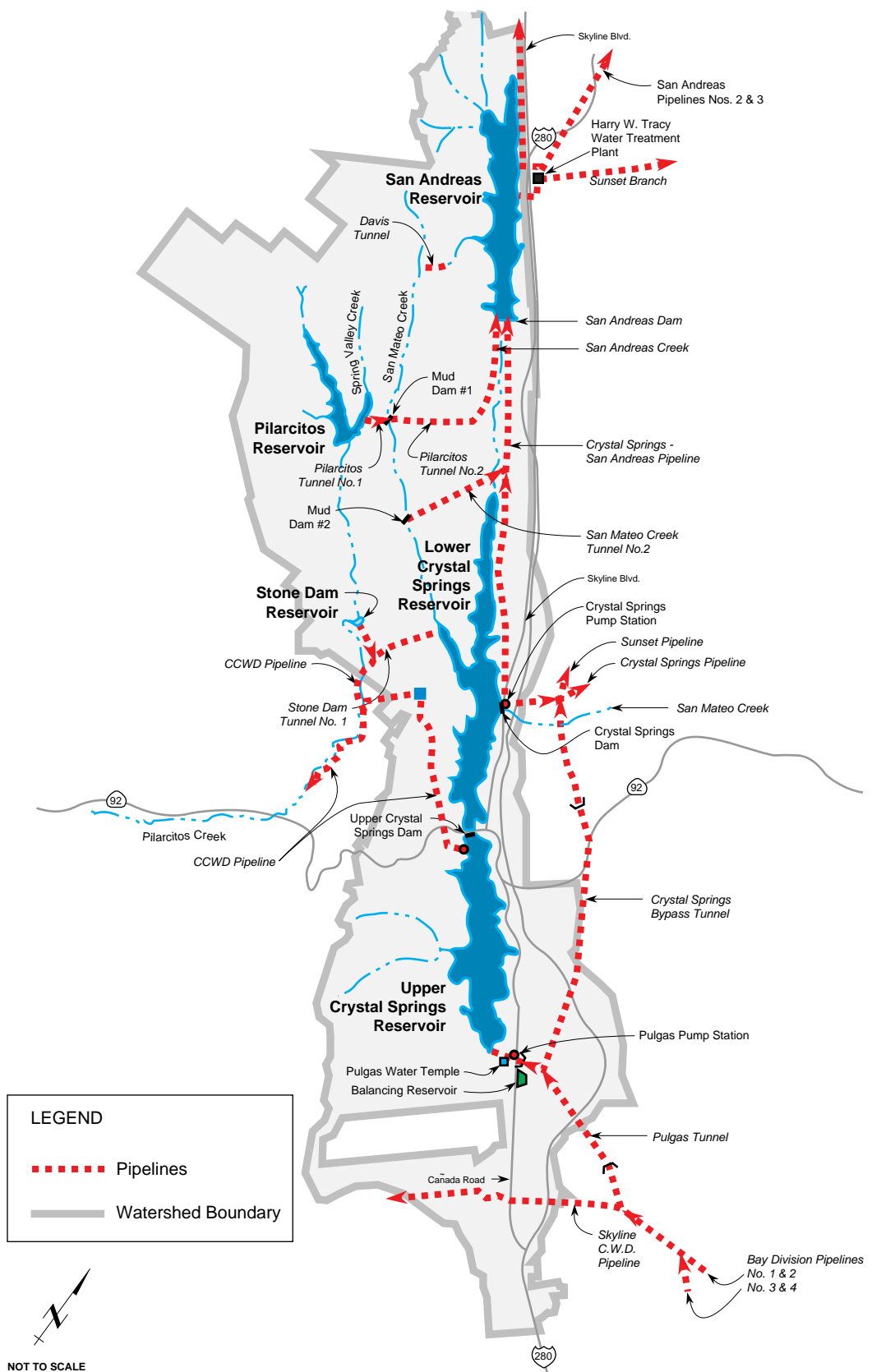
Three main creeks, San Mateo, Pilarcitos, and San Andreas creeks, provide natural drainage within the 23,000-acre Peninsula Watershed. However, drainage has been altered by the SFPUC water system, and currently drainage throughout the Watershed is hydraulically interconnected. The Watershed can be divided by the general drainage areas associated with the reservoirs that store water within the Watershed: (1) Upper and Lower Crystal Springs Reservoirs; (2) Pilarcitos Reservoir and Creek; and (3) San Andreas Reservoir. In addition, there are minor surrounding drainages within the SFPUC-owned lands, but they do not flow to the water supply reservoirs. Figure III.D-1 shows the Peninsula Watershed, including the tributary creeks, major diversions, and storage facilities.

In addition to local runoff originating within the Watershed, water stored in the San Andreas and Crystal Springs Reservoirs includes water originating from the Hetch Hetchy system that is often blended with treated water from the Alameda Watershed. This water is conveyed through the Bay Division Pipelines to Peninsula reservoirs. Runoff within the Peninsula Watershed provides about 5 to 10 percent of the total SFPUC's water supply. Some of the water in Pilarcitos Reservoir is conveyed to the Coastside County Water District (CCWD), which can also pump water out of Upper Crystal Springs Reservoir using its own pump station. Surplus water from Pilarcitos Reservoir can be conveyed to San Andreas or Crystal Springs Reservoirs. Water in San Andreas and Crystal Springs Reservoirs is maintained to provide adequate storage for the City and other users; water from these reservoirs is treated at the Harry W. Tracy Water Treatment Plant (Tracy WTP) prior to distribution, which typically occurs from Millbrae to the Sunset Reservoir in San Francisco.

1.1 UPPER AND LOWER CRYSTAL SPRINGS RESERVOIR

The southeastern portion of the Peninsula Watershed is essentially the same as the Upper Crystal Springs Reservoir drainage area. This reservoir was formed in 1877 with the construction of Upper Crystal Springs Dam. However, this dam is currently used as support for the SR 92 roadbed and no longer serves as a dam to retain water. A culvert underneath the roadbed connects Upper and Lower Crystal Springs Reservoir and allows a free exchange between the two reservoirs, as long as the water level in Upper Crystal Springs Reservoir is sufficiently high to reach the culvert.

The lands draining directly to Lower Crystal Springs Reservoir include the area between Cahill Ridge and I-280, north of SR 92 (and Upper Crystal Springs Dam), and the upper San Mateo Creek drainage basin, between Sawyer Ridge and Fifield Ridge. This reservoir was formed in 1890 after the Crystal Springs Dam was built on San Mateo Creek, below the confluence of its main branches. Skyline Boulevard was later constructed over Crystal Springs Dam. The combined Crystal Springs Reservoir has a catchment area of 22.5 square miles, with 13.5 and 9 square miles in the Upper and Lower Crystal Springs Reservoir watersheds, respectively.



LEGEND

- Pipelines
- Watershed Boundary

NOT TO SCALE

SOURCE: Montgomery Watson, 1993, Environmental Science Associates. Peninsula Watershed Management Plan / 930385 ■

Figure III.D-1
 Peninsula Watershed
 Facilities and System

Flows from Stone Dam Reservoir are conveyed to Crystal Springs Reservoir, which provides an additional 2.1 square miles of catchment area. The Crystal Springs Pump Station and Crystal Springs–San Andreas Pipeline is used to transfer water from Crystal Springs Reservoir to San Andreas Reservoir. The average annual rainfall in the vicinity of Upper and Lower Crystal Springs Reservoirs is 29.6 and 27.0 inches per year, respectively.

The combined Crystal Springs Reservoir has a capacity of 69,320 acre-feet (ac-ft), but is now operated at a capacity of 58,400 ac-ft due to dam safety requirements. Since the dams were first constructed, sedimentation to the reservoirs has reduced the maximum storage capacity of Upper and Lower Crystal Springs Reservoirs by about 24 and 14 percent, respectively, or about 20 percent for the two reservoirs combined. Future projects on the dam (not part of the Management Plan) would restore the original operating levels of the reservoir.

1.2 PILARCITOS RESERVOIR AND CREEK

Most of the northwestern portion of the Peninsula Watershed is within the Pilarcitos Creek drainage basin. Pilarcitos Creek originates within the Watershed and flows west out of the SFPUC-owned lands, eventually draining to the Pacific Ocean at Half Moon Bay; the creek also serves as a water source for users downstream of the Watershed. Natural drainage within the basin has been channeled by manmade facilities since 1864, including dams on the north and south branches of Pilarcitos Creek and Spring Valley Creek, forming Pilarcitos Reservoir. Pilarcitos Reservoir has a catchment area of 3.8 square miles and a capacity of 3,100 ac-ft. Since 1937, accumulated sedimentation has reduced the storage capacity of Pilarcitos Reservoir by about 18 to 20 percent. The reservoir was drained during the 1970s for dam improvements. The average annual rainfall in the vicinity of Pilarcitos Reservoir is 43.2 inches per year.

Some of the Pilarcitos Reservoir supply is used to provide water to the CCWD and flow is diverted from Pilarcitos Reservoir to the CCWD, system and conveyed out of the Watershed for use in the CCWD service area. The CCWD pipeline system can convey water from either the Pilarcitos system or from Crystal Springs Reservoir. Stone Dam Reservoir has a storage capacity of 15 ac-ft and is located about two miles downstream of Pilarcitos Dam along Pilarcitos Creek. As stated above, Stone Dam Reservoir water is conveyed to Crystal Springs Reservoir.

Pilarcitos Reservoir provides an emergency water supply to San Andreas and Crystal Springs Reservoirs. In addition, during times of surplus runoff, water is diverted by gravity flow from the north side of Pilarcitos Reservoir to San Mateo Creek. The surplus water is mixed with water from San Mateo Creek and is either conveyed to San Andreas Reservoir or flows down San Mateo Creek to Crystal Springs Reservoir.

1.3 SAN ANDREAS RESERVOIR

The northern end of the Peninsula Watershed lands, above the San Andreas Dam, comprises the drainage basin for San Andreas Reservoir. The San Andreas Reservoir was created on the San Andreas Creek in 1870, with the construction of San Andreas Dam. The catchment area of the

reservoir is 4.4 square miles, and the reservoir's capacity is 19,000 ac-ft. In addition, flows from the upper San Mateo Creek drainage area (about 2.5 square miles) can be conveyed to San Andreas Reservoir through Davis Tunnel. The average annual rainfall in the vicinity of San Andreas Reservoir is 34.8 inches per year.

In addition to receiving local runoff, San Andreas Reservoir can be used to store water from the Pilarcitos Reservoir and San Mateo Creek drainage, and from Crystal Springs Reservoir, which includes Hetch Hetchy water conveyed through the Bay Division Pipelines. Following reservoir construction in 1870, accumulated sedimentation has reduced the maximum storage capacity by about 20 percent. Outflow from the San Andreas Reservoir is pumped from two outlets to the Tracy WTP for treatment, before distribution to customers via the San Andreas Pipelines.

1.4 SURROUNDING DRAINAGES

On the northwestern margin of the Watershed, there are small areas amounting to less than one square mile that drain to San Pedro Creek to the north or Denniston Creek to the west. In addition, east of I-280, there are isolated SFPUC parcels within developed areas that do not drain to any waterbodies that enter the managed reservoir system.

1.5 WATER QUALITY

Water stored in the Peninsula reservoir system originates from numerous sources, including local Peninsula Watershed drainage, treated Alameda Watershed drainage, and the Hetch Hetchy system. The Hetch Hetchy water supply constitutes the majority of the water stored in this system and also has the highest water quality of the three sources.

The water supply in Crystal Springs and San Andreas Reservoirs is mostly Hetch Hetchy water, and therefore the raw water generally meets water quality standards. Levels of turbidity, *Giardia*, and *Cryptosporidium* are typically very low. Samples collected from Upper and Lower Crystal Reservoirs in 1997 did not indicate any *Giardia* or *Cryptosporidium*, although low levels were detected in samples from Pilarcitos and San Andreas Reservoirs.

Oxygen-depleted conditions are seasonally present in the lower depths of Lower Crystal Springs and Pilarcitos and Reservoirs during the late summer due to natural decomposition of organic matter. As a result, increased color levels¹ and elevated iron and manganese concentrations are common during this time of the year. Due to the shallow depth and greater wind exposure at San Andreas Reservoir, mixing of the reservoir is more prevalent, and an abundance of oxygen is found at all depths. Therefore, in San Andreas Reservoir, elevated iron and manganese concentrations are not found. Increased color levels have occurred at San Andreas Reservoir and other Peninsula reservoirs as a result of increased runoff from winter storms.

¹ Change in the natural color of surface water can be caused by contact of the water with organic debris, such as leaves, needles or wood, and can also be affected by suspended matter in the water. Color is a secondary drinking water standard, which is set for taste, odor, or appearance of drinking water, and is measured by color units through comparison with known laboratory standards.

As part of the development of the *Peninsula Watershed Management Plan*, characterization of existing conditions included identification of Water Quality Vulnerability Zones (WQVZs). These zones are areas where activities or disturbance would have the greatest potential to affect the water quality of surface runoff and water stored in the reservoirs. The WQVZs are classified as high, moderate, or low vulnerability based on criteria that assess proximity to water, intensity of rainfall, wildlife concentration, vegetation as a protective layer, slope, and soil. Disturbance to areas of the highest vulnerability would result in the greatest risk to water quality. The Management Plan identifies large areas of high vulnerability within the Watershed, some areas of moderate vulnerability, and almost no areas of low vulnerability (see Figure 2-3 of the Management Plan for a map of WQVZs).

The Management Plan also identifies areas of composite sensitivity or vulnerability with respect to water quality, wildfire, land instability and ecological resources. The composite map illustrates that there are few places within the Watershed that are completely free of resource vulnerability and sensitivity (see Figure 2-1 of the Management Plan for a map of composite high sensitivity zones). There are many areas where two or more of the high resource sensitivity areas overlap, indicating vulnerability or sensitivity for multiple resources. These resource sensitivity areas have one or more of the following characteristics: (1) water quality vulnerability; (2) wildfire severity; (3) land instability; and (4) ecological sensitivity.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for hydrology and water quality impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant effect on hydrology and water quality if it were to:

- substantially change absorption rates, drainage patterns, or the rate and amount of surface water runoff;
- substantially degrade water quality;
- contaminate a public water supply;
- substantially degrade or deplete groundwater resources or interfere with groundwater recharge; or
- cause substantial flooding, erosion, or siltation.

Criteria for evaluating surface and ground water quality in the San Francisco Bay Area are based on beneficial uses and water quality objectives established by the Regional Water Quality Control Board, San Francisco Bay Region, as authorized under the Porter-Cologne Water Quality Control Act. Both beneficial uses and water quality objectives applicable to waterbodies within the area affected by the Management Plan are described in *The Water Quality Control Plan for the San Francisco Bay Basin*, also referred to as the *Basin Plan* (California RWQCB, 1995). Criteria for

evaluating impacts to drinking water quality are based on California Drinking Water Standards, as established by the California Safe Drinking Water Act. Criteria for evaluating flooding hazards are based on effects to on-site and downstream 100-year flood zones, as established by the Federal Emergency Management Agency.

2.2 PROGRAM-LEVEL IMPACTS

The *Peninsula Watershed Management Plan* is designed to maintain and improve the water quality of source drinking water in order to protect public health and safety, which is the Management Plan's primary goal. Water Quality Policies WQ1 to WQ31 are specifically designed to address management of natural resources, watershed activities, and other land use issues in order to maintain and improve water quality. These policies aim to minimize or reduce water quality problems through the control of erosion, sedimentation, stormwater runoff, the introduction of undesired constituents into the water supply, and land ownership and activities. Implementation of these policies and associated management actions would result in direct beneficial effects to water quality in the Watershed.

As stated in the Management Plan, "[i]n all management cases, the primary goal must be met first, even if an intended action is focused on a secondary goal." Thus, policies under the six supporting secondary goals and associated management actions, while not necessarily supporting the primary goal directly, are still intended to be consistent with the overriding, primary goal of improving and maintaining water quality.

The policies and management actions identified in the Management Plan cover a diverse range of land uses and management activities that have the potential to affect water quality, either directly or indirectly. Watershed activities with the potential to affect water quality include recreational use by the public and golf course operation. SFPUC operations, maintenance, and construction activities conducted on Watershed lands that could indirectly affect water quality include hazardous materials use and pest management, vegetation/soil/fire management, stormwater control, and construction of roads or other structures. Unless proper precautions were employed, these various activities could result in a significant effect on water quality and hydrology. The Management Plan is designed so that there are policies and/or management actions pertaining to implementation of these activities that would reduce the potential effects and thereby still achieve the primary goal of maintaining and improving water quality. Table III.D-1 summarizes the actions that are related to maintenance and protection of water quality.

For all potential water quality impacts, the 31 Water Quality Policies (WQ1 to WQ31) presented in the Management Plan would directly address water quality protection in the Watershed and, in conjunction with a wide array of management actions, would reduce water quality impacts to less than significant. In addition, as stated previously, there are numerous interrelated water quality policies and management actions throughout the Management Plan, including actions for review, staffing, training, and funding, that collectively would serve to reduce potential water quality impacts associated with Management Plan implementation through collaborative efforts.

**TABLE III.D-1
SUMMARY OF MANAGEMENT POLICIES RELATED TO
WATER QUALITY PROTECTION**

Water Quality (WQ)

- WQ1 Prevent the introduction of pesticides and chemicals into the water supply by minimizing and controlling the use of these compounds.
- WQ2 Restrict aerial broadcast spraying of pesticides as a means of vegetation management/pest control.
- WQ3 Minimize nutrient loading to the water supply.
- WQ4 Minimize the introduction of disinfection by-product precursors to the water supply.
- WQ5 Minimize the risk of metals leaching to waterbodies and prohibit dumping of metals within the Watershed.
- WQ6 Prevent the introduction of asbestos fibers into the water supply.
- WQ7 Prevent the potential for hazardous materials spills into the water supply by controlling their use and transport within the Watershed.
- WQ8 Minimize the introduction of pathogens to the water supply.
- WQ9 Minimize, and where possible prohibit, the construction of new roads and trails.
- WQ10 Where new roads or trails are required, locate and design them to follow natural topography.
- WQ11 Minimize, and where possible restrict, the construction of new roads or access easements through Watershed lands to serve new development not in SFPUC ownership to areas of low vulnerability.
- WQ12 Minimize, and where possible restrict, new easements and rights-of-way through the Watershed land to areas of low vulnerability.
- WQ13 Optimize the existing road system such that there are no more roads than necessary for operations and maintenance purposes.
- WQ14 Minimize, and where possible prohibit, land uses and activities that have the potential to cause erosion, sediment generation, and stormwater runoff.
- WQ15 Where suitable, use sedimentation basins to control the effects of erosion and sediment transport.
- WQ16 Minimize, and where possible prohibit, the creation of impervious surfaces on Watershed lands.
- WQ17 Minimize vehicle-related contaminants in runoff from roads, parking lots, facilities, etc.
- WQ18 Minimize, and where possible prohibit, the construction of new on-site waste treatment systems to serve facilities or other new developments on Watershed lands.
- WQ19 Coordinate water quality concerns with fire management activities to prevent erosion.
- WQ20 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.
- WQ21 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.
- WQ22 Prohibit the sale or exchange of SFPUC lands within the Watershed that are critical to water quality, supply, and SFPUC operations.
- WQ23 Ensure that Caltrans conducts regular maintenance and monitoring of its sedimentation basins and turbid water collection basins.
- WQ24 Actively participate in local and regional government planning processes to keep abreast of new projects that may affect SFPUC lands and water quality.
- WQ25 Wherever possible, preserve and protect stream channels and banks to protect water quality by maintaining or improving channel stability and reducing bank erosion.

TABLE III.D-1 (Continued)
SUMMARY OF MANAGEMENT POLICIES RELATED TO
WATER QUALITY PROTECTION

Water Quality (WQ) (cont.)

- WQ26 Prohibit unauthorized fill or excavation activities on wetlands, riparian zones, etc.
- WQ27 Prohibit swimming, boating, and windsurfing and other body-contact activities in all water sources.
- WQ28 Strictly control public access to minimize adverse effects to water quality.
- WQ29 Actively enforce penalties and other standard enforcement procedures on activities that adversely affect water quality.
- WQ30 Require intensive management and ongoing monitoring of land uses that could result in the introduction of pathogens into the water supply.
- WQ31 Require ongoing water quality monitoring of reservoirs and tributaries to detect decreases in water quality related to Watershed activities.

Water Supply (WS)

- WS4 Prevent a reduction in the water supply by reducing risks to water quality.
- WS5 Require that all reclaimed water used on the Watershed meet Department of Health Services / Regional Water Quality Control Board requirements.
- WS6 Enhance the water yield of the Watershed, where compatible with other natural resource management policies, while prohibiting activities that could adversely affect water quality.

Vegetation (V)

- V1 Manage an Integrated Pest Management program. Where possible, eliminate the use of chemical applications 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.
- V2 Focus chemical-use reduction efforts in areas where they are currently being used most intensively.

Aquatic Resources (AR)

- AR5 Minimize, and where possible eliminate, the introduction of chemicals into reservoirs and streams to protect aquatic resources.
- AR10 Prohibit selected classes of activities, or limit land use type, duration, and intensity within the high WQVZs, consistent with other management elements.

Fire (F)

- 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.
- F3 Require all lessees and permittees to conduct fire hazard reduction activities.
- F5 Provide adequate water supplies, road infrastructure, and equipment to allow fire personnel to effectively respond to and suppress fires on the Watershed.
- F6 Provide staff training to adequately detect, respond to, suppress, and report fires on SFPUC lands.
- F7a Prohibit unsupervised access to the Watershed in all areas except the Fifield/Cahill Ridge Trail to reduce the risk of fire; or
- F7b Prohibit unsupervised access to the Watershed to reduce the risk of fire.
- F8 Restrict access to the Watershed, implement strict fire hazard reduction practices, and initiate the public information processes during periods of extreme fire hazard.

TABLE III.D-1 (Continued)
SUMMARY OF MANAGEMENT POLICIES RELATED TO
WATER QUALITY PROTECTION

Fire (F) (Continued)

- F12 Require that fuel treatment activities be conducted in an ecologically sound manner, to the greatest extent possible and that when used, prescribed burning strives to mimic natural fire regimes.
- 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 east.
- F14 Focus fuel management activities adjacent to priority areas.

Safety and Security (S)

- S8 Require that utility pipelines within the Watershed meet current seismic standards and comply with applicable hazardous materials regulations.

Watershed Activities (WA)

- WA1 Prohibit activities that are detrimental to Watershed resources.
- WA2 Prohibit the construction of new trails and unsupervised access to existing roads and trails not addressed in the Management Plan.
- WA3 Prohibit the construction of new pipelines through the Watershed for the transmission of gas, oil, or other hazardous substances.
- WA4 Prohibit all commercial and non-SFPUC residential development on Watershed lands not addressed in the Management Plan.
- WA7 Limit the number of facilities requiring construction of new waste disposal systems on SFPUC lands to those that are essential, where possible.
- 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 the Management Plan.
- 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.
- WA17 All individuals and groups granted permits to Watershed lands shall be charged user fees to cover the operational costs.
- WA18 Manage a volunteer docent program to accommodate supervised access to the Watershed.
- WA19 All proposed plans and projects on the Watershed shall be reviewed for compliance.
- WA20 Should it be determined that a proposed plan/project would not comply with goals and policies, make appropriate comments so that the applicant may bring the proposed plan/project into compliance.
- WA22 Require that new facilities and improvements be limited to specific uses and design.
- WA23 Require that all development, except for water-dependent structures, be excluded from the high WQVZ and set back from the ordinary high water mark of reservoirs and from the centerline of all Watershed tributaries.
- 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.
- WA25 All lessees/permittees requiring the use of pesticides shall comply with the provisions of the City's Pesticide Management Plan Ordinance and the SFPUC Integrated Pest Management Plan.
- WA26 All maintenance, operation, and construction activities shall incorporate best management practices, as applicable.

TABLE III.D-1 (Continued)
SUMMARY OF MANAGEMENT POLICIES RELATED TO
WATER QUALITY PROTECTION

Watershed Activities (WA) (cont.)

- WA28 All proposed plans and projects shall be subject to review under CEQA and/or NEPA, where applicable.
- WA29 Require the use of LRMS GIS as an integral part of Watershed planning efforts.
- WA30 Prior to initiating new construction, consider reuse of existing structures for departmental uses.
- WA32 To avoid unintentional or inadvertent impacts to Watershed resources, LRMS staff shall administer, manage, direct, and supervise all Watershed operations and maintenance activities.
- WA33 To avoid unintentional or inadvertent impacts to Watershed resources, all water system maintenance activities should be handled in an advisory fashion.
-

This section discusses the potential impacts of implementation of the policies and management actions in the *Peninsula Watershed Management Plan* on the hydrology and water quality of the Watershed. For each type of action, there is a discussion and a table with two parts: one part summarizing the impact-inducing policies or management actions that could result in potentially significant water quality impacts, and the second part summarizing the policies or management actions that could be required to reduce the impacts to a less than significant level. The following types of actions that could result in water quality impacts are addressed: increased public access and use, development of new facilities, and operations and maintenance activities. In addition, hydrologic impacts due to potential build-up of sediments are discussed.

Water Quality Impacts Associated with Increased Public Access and Use

The *Peninsula Watershed Management Plan* includes facilities that could result in increased public visitation of the Watershed by providing new trails (Policies WA15.2 and WA15.4 and Action tra2 [the southern trail extension of the Fifield/Cahill Ridge Trail), increased information (such as maps and brochures) regarding public activities available on the Watershed, or additional public activity destinations. The facilities that would promote increased public use include information kiosks (Action pub3) and a Watershed Visitor Education Center (Action pub4). In addition, provision of universal access at Watershed facilities could increase public use of the Watershed (Action des8).

Increased public use of the Watershed could indirectly affect water quality due to the lack of adequate sanitation facilities along trails, unauthorized body-contact with reservoir or creek waters, use by domestic animals, littering, fire hazard, etc. With increased public use, there would be an increased need for toilets and sanitation facilities to prevent human waste from entering runoff in proximity to creeks and reservoirs or seeping into groundwater, which would degrade water quality. There would be a commensurate increase in the potential for unauthorized uses, such as swimming, walking of domestic pets, littering, smoking, and other fire hazards. Swimming or other body contact in reservoirs or creeks would directly increase

bacteriological contamination of water supplies, while domestic animals (e.g., dogs) would indirectly contribute to bacteriological contamination due to the associated animal wastes. Littering or dumping could introduce chemicals (e.g., motor oil) or nutrients (e.g., food) that could degrade surface waters, depending on the nature of the discarded materials and proximity to waterbodies. Depending on the nature and extent of the specific activity, public use could inadvertently result in degradation of water quality, either through surface runoff or seepage through groundwater. In addition, public use has the potential to adversely affect vegetation and soil, which could lead to increased erosion and sedimentation and thereby indirectly affect water quality. Therefore, increased public access and use, if improperly managed, could result in significant water quality impacts.

As discussed in Section III.G, Fire Management, the increase in public access and use would be associated with increased risk of fire hazards. Increased public use of the Watershed could lead to increased incidences of unauthorized uses such as smoking and campfires/cooking fires. Wildland fire within the Watershed poses a significant risk to water quality. Wildland fire followed by a rainfall event can result in major effects on water quality. Water quality is affected through the loss of the vegetative cover that is burned, which then leads to increased soil erosion and sedimentation, particularly on steeper slopes. Depending on the extent of a fire, stormwater runoff following a fire can transport large quantities of soil to water supply reservoirs and result in elevated levels of turbidity that may be beyond the capability of the water treatment plant. If the turbidity levels cannot be reduced through treatment and exceed drinking water standards, the public water supply would be adversely affected until turbidity levels were reduced. This would be a significant impact to water quality. Water quality can also be directly affected during and immediately after a fire by ash fall-out, which increases the total organic carbon in surface waters.

While the Management Plan proposes management policies and actions that could bring about physical effects, the Management Plan also includes policies and actions that would reduce these potential effects. The top portion of Table III.D-2 lists the policies and management actions related to public access and use that could result in significant water quality impacts, while the bottom portion of the table lists the full range of policies and management actions that, on a program level, could be required to reduce the impacts. Because water quality is the primary goal of the Management Plan, the impact-reducing policies or management actions are interrelated, and, at a program level, could be essential to minimizing potential impacts. Not every action would be necessary to mitigate the effects of the associated potential impact-causing management action. For example, a very minor structure such as a kiosk located in an environmentally non-sensitive area may not require all of the actions listed on Table III.D-2 to avoid a significant effect. Because implementation information, such as locations of specific facilities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

TABLE III.D-2
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS
DUE TO INCREASED PUBLIC ACCESS AND USE

Impact-Inducing Policies or Management Actions:^a

- Action pub3: Establish information kiosks at Watershed entryways.
- Action pub4: Establish a Watershed Visitor Education Center.
- Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.
- 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, trails, or other agencies, and complete a north-south public trail along the eastern edge of the Watershed.
- Action des8: Implement universal access improvements at SFPUC facilities and trails.

Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant:^a

- Policies WQ9, WQ10, WQ14, 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 WQVZs.
- Policies F2, F3, F5, F6, F7a/F7b, and F8: Prohibit certain activities likely to cause a fire, require fire hazard reduction activities, provide for fire suppression needs, and manage public access.
- Policies WA1, WA2, WA4, WA13, WA16, WA17, and WA18: Prohibit activities that are detrimental to Watershed resources, restrict new trails and access, restrict development, call for managing public use by education, and implement a permit process.
- Actions was1, was2, and was5: Require management of public sanitary facilities.
- Actions fir1 through fir14 (derived from the Fire Management Element): Conduct an integrated approach to fire management.
- Actions saf2 through saf17: Include measures to protect human health and safety as well to protect water quality through regular maintenance of public facilities and emergency response.
- Action veg1: Monitor human activities as one aspect of a Vegetation Management Plan.
- Action aqu4: Prohibit land use activities in the shoreline segments that cause excessive sedimentation to reservoirs.
- Actions lea3, lea4, lea5, and lea7: Require that all land use leases include water quality protection measures and a monitoring plan.
- Actions pub1 through pub10: Develop public education and awareness of Watershed management and water quality protection measures.
- Action sta6: Implement specific water quality training for staff.
- Action fic2: Authorize or prohibit specific lease and permit activities based partially on impacts to water quality.
- Action inf3: Require recording and updating of water quality data.

^a See Table II-1 for a description of each management action.

Policies and management actions included in the Management Plan would assure that public use and access activities are consistent with the primary goal of protecting water quality. Water Quality Policies WQ9, WQ10, WQ14, WQ27, WQ28, and WQ29 specifically address potential water quality impacts associated with public use and access by minimizing construction of new trails, restricting trail design and locations, minimizing or prohibiting activities that cause sedimentation, and restricting public access and activities. Policy AR10 would minimize potential water quality impacts associated with public use and access by prohibiting certain activities within high WQVZs. Policies WA1, WA2, WA4, WA13, WA16, WA17, and WA18 address general approaches to reducing the effect of public use activities on Watershed resources and water quality. Human waste management Actions was1, was2, and was5 would manage sanitary facilities that relate directly to public use.

The *Peninsula Watershed Fire Management Element* (Appendix A-1 of the Management Plan) presents an integrated approach to fire management that considers impacts to water quality, water supply, and ecological resources and protection of persons and property. Implementation of Fire Management Policies F2, F3, F5, F6, F7, and F8 and the 14 fire management actions would reduce the potential impact associated with increased turbidity following fire events to a less than significant level.

Safety and security 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 and emergency response for public users. Action veg1, development of a Vegetation Management Plan, includes monitoring of human activities and habitat alterations, which would reduce potential impacts associated with public use. Action aqu4 would prohibit land use activities in the high-risk shoreline segments. Lease and Permit Requirements Actions lea3, lea4, lea5, and lea7 would ensure that land use leases include water quality protection measures and a monitoring plan. Public and Agency Outreach Actions pub1 through pub10, while promoting and possibly facilitating public access, would also develop public education and awareness of Watershed management and water quality protection measures that would offset potential impacts associated with public use. Action sta6 would provide specific water quality training for SFPUC staff, and Action fic2 would authorize or prohibit specific lease or permit activities, partially based on impacts to water quality. Action inf3 would require that water quality data be recorded and updated.

Implementation of the policies and management actions described above, and as described in Section IV.D, would reduce potential water quality impacts related to increased public access and use to a less than significant level. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Water Quality Impacts Associated with Development of New Facilities

Implementation of the Management Plan would result in a number of additional facilities or improvements on the Watershed, thereby generating potential construction impacts. Many of the projects would be undertaken to ensure and/or improve water quality or resource protection on the Watershed, such as implementation of barriers or fences along reservoir edges, dams, and identified high-risk spill potential areas (Actions haz4 and haz8); cleanup and enhancement of the Skyline Quarry (Action haz7); implementation of barriers on Upper Crystal Springs Dam (Action haz9); installation of infiltration drainfields and detention basins (Action sto1); installation of long-term sediment retention basins or other permanent measures (Action aqu12); rehabilitation of shoreline areas and stream segments (Actions aqu5 and aqu7); improvements that prevent human and animal waste from impacting Watershed resources (Actions was1 and was5); and installation of wildlife passage structures (Action wil14). Many of the actions listed in the Roads Section of the Management Plan (Actions roa2, roa3, roa4, roa6, roa7, and roa8) would modify or relocate existing roads or road components in order to reduce the potential for erosion and Watershed contamination from automobile by-products. Fire management actions include the installation of hydrants, helispots, and water tanks (Actions fir2 through fir5); roadway and access improvements (Actions fir6 and fir7); and implementation of fuel management projects that include constructing fuel breaks, conducting prescribed burns, and other improvements (Action fir8). Construction projects would be generated through actions that would provide additional public use opportunities, such as information kiosks and a Watershed Visitor Education Center (Actions pub3 and pub4), a southern extension of the Fifield/Cahill Ridge Trail (Action tra2), and new trails (Policies WA15.2 and WA15.4). In addition, implementation of Action des8 would result in universal access improvements at SFPUC facilities and trails.

Due to the extent of high and moderate WQVZs within the Watershed, both construction and operation of such facilities could adversely affect water quality in the Watershed. Construction activities typically involve grading and other earthmoving activities that could lead to excess erosion and sedimentation. Long-term operation of facilities, depending on the specific nature of the facility, would typically increase the area of impervious surfaces as well as introduce manmade chemicals and other materials to the Watershed that could in turn enter stormwater runoff and affect the water quality of receiving waters. Therefore, due to the potential to substantially degrade water quality during construction or operation, development of new facilities could result in potentially significant water quality impacts.

The top portion of Table III.D-3 lists the policies and management actions related to development of new facilities that could result in significant water quality impacts, while the bottom portion of the table lists the full range of impact-reducing policies and management actions which, on a program-level, could be required to reduce the potential impacts. These impact-reducing policies and management actions are briefly summarized below.

Policies and management actions are included in the Management Plan that would assure that development of new watershed facilities would be consistent with the primary goal of protecting water quality. Policies WQ9, WQ10, WQ11, WQ12, WQ14, WQ16, WQ18, WQ20, WQ21, and

TABLE III.D-3
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS
DUE TO DEVELOPMENT OF NEW FACILITIES

Impact-Inducing Policies or Management Actions:^a

- Action haz4: Identify key locations for, and install, barriers or fencing to prevent access to reservoir edges and dams.
- Action haz7: Develop and implement a cleanup and enhancement plan for Skyline Quarry, including slope stabilization.
- Action haz8: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.
- Action haz9: Install barriers on Upper Crystal Springs Dam.
- Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, or 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 toilets as necessary.
- Action was5: Install restrooms on Army Road.
- Action roa2: Relocate necessary high-use roads/road segments in proximity to streams.
- Action roa3: Modify the grading and drainage of 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 seven hydrants into water sources.
- Action fir3: Install and maintain a total of five helispots.
- Action fir4: Install two additional hydrants on adjacent lands.
- Action fir5: Install two additional water tanks.
- Action fir6: Undertake road improvements to improve access for fire suppression.
- Action fir7: Identify and 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 will14: Design and install wildlife passage structures that minimize wildlife losses.
- Action pub3: Establish “gateway” information kiosks.
- Action pub4: Establish a Visitor Education Center.
- Action tra2: Provide a southern extension to the Fifield/Cahill Ridge Trail.
- Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.

^a See Table II-1 for a description of each management action.

TABLE III.D-3 (Continued)
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS
DUE TO DEVELOPMENT OF NEW FACILITIES

Impact-Inducing Policies or Management Actions:^a (cont.)

- Policy WA15.4: Support new trail connections that link to adjacent communities, trails, or other agencies, and complete a north-south public trail along the eastern edge of the Watershed.
- Action des8: Implement universal access improvements at SFPUC facilities and trails.

Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant:^a

- Policies WQ9, WQ10, WQ11, WQ12, WQ14, WQ16, WQ18, WQ20, WQ21, 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.
- Policy AR10: Prohibit certain activities within high WQVZs.
- Policies F3, F5, and F6: Require fire hazard reduction activities for new lessees and provide for fire suppression equipment needs.
- Policies WA7, WA19, WA20, WA22, WA23, WA24, WA25, WA28, and WA30: Limit construction of new waste disposal systems, require review process for new projects, and set restrictions for new facilities.
- Action roa12: Specify requirements for new roads developed in the Watershed.
- Actions veg4 and veg9: 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 WQVZ.
- 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, des2, and des3: Require a review process for all proposed plans and projects.
- 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.

^a See Table II-1 for a description of each management action.

WQ24 would minimize potential water quality impacts associated with development of new facilities by setting restrictions on new roads, restricting land use activities that cause sedimentation, restricting creation of impervious surfaces, restricting construction of new on-site waste treatment systems, and coordinating with other agencies regarding new construction. Aquatic Resources Policy AR10 would minimize potential water quality impacts associated with development of new facilities by prohibiting certain activities within high WQVZs. Fire Policies

F3, F5, and F6 would minimize potential water-quality impacts associated with development of new facilities by requiring fire hazard reduction activities for new lessees and by providing for fire suppression equipment needs. Policies WA7, WA19, WA20, WA22, WA23, WA24, WA25, WA28, and WA30 would provide a general approach for limitations, requirements, planning, and monitoring of new facilities.

Roads Action roa12 specifies requirements for new roads developed in the Watershed. Vegetation Action veg4 would require an approved grading plan prior to any construction project, and Action veg9 would require that construction activities comply with erosion-control best management practices. Aquatic Zone Protection Action aqu1 would require site-specific review to ensure that construction of new non-water-dependent facilities would not be located within a high WQVZ.

The Management Plan includes management actions under Design and Construction Requirements (des1, des2, and des3) that would minimize and avoid, wherever possible, the potential effects of facility construction. These actions would require a review process for proposed plans and projects to determine compatibility with the Management Plan goals and policies for water quality. The Management Plan also includes actions that require environmental review for CEQA compliance (Actions env1 through env6). Action sta6 would provide specific water quality training for SFPUC staff; Action fic2 would authorize or prohibit specific lease or permit activities partially based on impacts to water quality; and Action inf3 would record and update water quality data to establish a database for overall water quality management. Actions lea3, lea4, and lea5 would require that all new land uses include water quality protection measures and a monitoring plan.

On a program level, implementation of the policies and management actions described above, and as described in Section IV.D, would reduce potential water quality impacts related to construction of Watershed facilities to a less than significant level. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Water Quality Impacts Associated with Watershed Operations and Maintenance Activities

SFPUC operations and maintenance activities on the Watershed include stormwater control, road maintenance, mowing, road grading, slide repair, controlled burning, etc., and unless appropriate precautions are employed, could result in unintentional or inadvertent impacts to water quality and Watershed resources. For example, road grading, slide repair, and controlled burning could result in excess erosion and sedimentation in runoff that could eventually reach water supply reservoirs. Improper use of chemicals, such as vehicle fuels or pesticides, could result in contaminants in groundwater or in stormwater runoff that could also eventually reach the water supply reservoirs.

Under the Management Plan, Policy F11 allows for prescribed burns as part of regular fire management. Actions con4 and wil7 call for use of vegetation treatments or prescribed fire to reduce brush and enhance wildlife habitat. Land and Resource Management Section (LRMS) staff would administer, manage, direct, and supervise all Watershed operations and maintenance activities. Unless a wide range of interrelated policies and management actions were implemented, watershed operations and maintenance activities could inadvertently but substantially degrade water quality and result in potentially significant water quality impacts.

The top half of Table III.D-4 list those policies and management actions related to watershed operation and maintenance activities that could result in potentially significant water quality impacts, while the remainder of the table lists the full range of impact-reducing policies and management actions which, on a program-level, could be required to reduce the potential impacts. Implementation of these policies and management actions would ensure that Watershed operations and maintenance activities were consistent with the primary goal of protecting water quality and would minimize potential water quality impacts associated with Watershed operations and maintenance activities. These impact-reducing policies and management actions are briefly summarized below.

Water Quality Policies WQ1 through WQ8, WQ13, WQ14, WQ15, WQ17, WQ19, WQ22, WQ23, WQ25, WQ26, WQ30, and WQ31 specifically address potential water quality impacts associated with Watershed operations and maintenance activities by managing use of pesticides, metals, hazardous materials, and other chemicals; minimizing nutrient loading; preventing introduction of asbestos into the water supply; minimizing introduction of pathogens into the water supply; optimizing use of the existing road system; controlling sedimentation and erosion; protecting wetland and stream channels; coordinating with agencies to protect water quality; and requiring ongoing monitoring of activities and water quality.

Policies WS4, WS5, and WS6 are general statements that would prohibit water yield activities that could adversely affect water quality. Policies V1 and V2 address potential water quality impacts from operations and maintenance activities by managing pest management and chemical use. Aquatic Resources Policies AR5 and AR10 would minimize the introduction of chemicals into reservoirs and streams and prohibit certain activities within high WQVZs. Fire Policies F5, F6, F12, F13, and F14 would provide for fire suppression needs and regulate fuel management activities, while Policy S8 would reduce potential water quality impacts associated with Watershed operations and maintenance activities by requiring utility pipelines to comply with hazardous materials regulations. Watershed Activities Policies WA3, WA26, WA29, WA32, and WA33 address the overall approach to operations and maintenance activities, including requiring best management practices and providing oversight and supervision.

Stormwater Actions sto1 through sto4 require management of existing stormwater drainage facilities to protect water quality as well as to reduce the volume of stormwater runoff. To preserve and maintain water quality, Hazardous Materials and Contaminants Actions haz1 through haz15 specify procedures for proper use, storage, and handling of chemicals used for operations and maintenance activities, including herbicides and petroleum products. Roads

**TABLE III.D-4
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS
DUE TO WATERSHED OPERATIONS AND MAINTENANCE ACTIVITIES**

Impact-Inducing Policies or Management Actions:^a

- Policy F11: Allow for use of prescribed burns for fuel management.
- Action con4: Use prescribed fire in areas subject to brushy encroachment.
- Action wil7: Create palatable re-sprouting through mechanical treatments or prescribed fire.

Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant:^a

- Policies WQ1 through WQ8, WQ13, WQ14, WQ15, WQ17, WQ19, WQ22, 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 into the water supply; optimize use of the existing road system; control sedimentation and erosion; protect wetland and stream channels; coordinate with agencies to protect water quality; and require ongoing monitoring of activities and water quality.
- Policies WS4, WS5, and WS6: Prohibit water yield activities that could adversely 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 potential water quality impacts associated with Watershed operations and maintenance activities by minimizing the introduction of chemicals into reservoirs and streams and by prohibiting certain activities within high WQVZs.
- Policies F5, F6, F12, F13, and F14: Provide fire suppression needs and regulate fuel management activities.
- Policy S8: Require utility pipelines to comply with hazardous materials regulations.
- Policies WA3, WA26, WA29, WA32 and WA33: Prohibit construction of utility pipelines, require all operations and maintenance activities to incorporate best management practices; require LRMS staff to administer, manage, direct and supervise all Watershed operations and maintenance activities; use the GIS as part of Watershed planning and managing water system maintenance activities for Watershed protection.
- Actions sto1, sto2, sto3, and sto4: Manage stormwater drainage facilities.
- Actions haz1 through haz15: Manage use, storage, and handling of hazardous materials associated Watershed operations and maintenance.
- Actions roal through roal1: Assess and manage existing roads to minimize effects on water quality.
- 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 veg9: Require that operations and maintenance activities comply with erosion-control best management practices. Actions veg10 and veg11: Identify areas subject to slope instability and soil erosion and require implementing erosion control. Action veg12: Establish long-term erosion and sediment control monitoring. Action veg13: Develop and implement an Integrated Pest Management program for the Watershed. Action veg17: Minimize the disturbance of serpentine soils to prevent erosion of asbestos fibers to the water supply.

^a See Table II-1 for a description of each management action.

TABLE III.D-4 (Continued)
SUMMARY OF POTENTIALLY SIGNIFICANT WATER QUALITY IMPACTS
DUE TO WATERSHED OPERATIONS AND MAINTENANCE ACTIVITIES

Policies or Management Actions that Could be Required to Reduce Potential Impacts to Less Than Significant (cont.):^a

- Actions aqu2 through aqu8: Provide strategies for protection of reservoir shorelines and streambanks. Actions aqu10 through aqu14: Specify management of sedimentation basins or sediment detention basins to optimize their use in maintaining water quality.
- Actions fir1 through fir14 (derived from the Fire Management Element): Conduct an integrated approach to fire management.
- Actions fis6 and fis7: Adopt nontoxic management practices and dechlorinate water discharges to the reservoirs 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.

^a See Table II-1 for a description of each management action.

Actions roa1 through roa11 require assessment and management of existing roads to minimize effects on water quality. Safety and Security Management action saf12 calls for developing, publishing, and periodically updating a Watershed manual that addresses operations and maintenance procedures, emergency response procedures, and the safety and security program. Implementation of the overall Fire Management Element and Actions fir1 through fir14 would reduce risks associated with use of prescribed burns.

The Management Plan includes a range of vegetation, soil, and pest management actions that address management of the vegetation communities and soil resources critical to the maintenance of water quality and supply. Action veg1 would require preparation and implementation of a Vegetation Management Plan. Action veg9 would require that operations and maintenance activities comply with erosion-control best management practices. Actions veg10 and veg11 would identify areas subject to slope instability and soil erosion and would require implementing erosion control. Action veg12 would establish long-term erosion and sediment control monitoring. Action veg13 would develop and implement an Integrated Pest Management program for the Watershed. Action veg17 would minimize the disturbance of serpentine soils to prevent erosion of asbestos fibers to the water supply.

Aquatic Zone Protection Actions aqu2 through aqu8 provide guidance for operations and maintenance activities for the protection of reservoir shorelines and streambanks, which relate directly to protecting water quality; Actions aqu10, aqu11, aqu12, aqu13, and aqu14 specify management of sedimentation basins or sediment detention basins to optimize their use in

maintaining water quality. Actions fis6 and fis7 would adopt nontoxic management practices for protection of aquatic resources and also call for dechlorination of water discharged to the reservoirs, as required by the Regional Water Quality Control Board. Action sta6 would provide specific water quality training for SFPUC staff; Action fic2 would authorize or prohibit specific lease or permit activities partially based on impacts to water quality; and Action inf3 would record and update water quality data to establish a database for overall water quality management.

On a program level, implementation of the policies and management actions described above, and as described in Section IV.D, would reduce potential water quality impacts related to Watershed operations and maintenance activities to a less than significant level. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Build-Up of Sediments

The major hydrologic flow patterns within the Watershed, as described above under Section 1.0, Setting, would essentially remain unaltered under the Management Plan. Natural drainage patterns have been modified over the past century to accommodate water diversion, storage, treatment, and conveyance facilities. Activities within the Watershed have resulted in sedimentation to reservoirs and streams and have indirectly affected both water quality and hydrology. During the rainy season, rainfall runoff within the Watershed transports sediments to streams, and a portion of the sediments eventually reaches the reservoirs, causing increased turbidity during the rainy season in both the streams and reservoirs. Gradually, sediments settle at the bottom of the streams and reservoirs, and, over time, the accumulated sediments have altered stream channels, modified stream flow and capacity, and have reduced the water storage capacity of reservoirs.

As described above under Water Quality impacts, numerous watershed activities, such as new trails, increased public use, unauthorized off-trail use in areas near reservoirs and creeks, construction activities (including any grading activities), wildland fires, and many operations and maintenance activities, could cause erosion and sedimentation and further alter stream channels, resulting in cumulative build-up of sediments that could gradually reduce the water storage capacity of reservoirs. In addition, in the event of a large fire on the Watershed followed by rainfall, there would be a substantial increase in sedimentation, particularly on steeper slopes left denuded of ground vegetation, which could lead to blocked or partially blocked stream channels, altered stream flows, and increased deposition of sediments to reservoirs. Unless appropriate control measures were implemented, these activities could cause substantial erosion or siltation, either individually or cumulatively; therefore, these activities would result in potentially significant hydrologic impacts to stream channels and flow, and to reservoir storage capacity.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential

effects. Table III.D-5 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented.

Numerous policies and management actions included in the Management Plan would assure that erosion, sedimentation, and siltation could be controlled within the Watershed such that potential hydrologic impacts would be reduced. Policies and management actions with specific reference to control of erosion and sedimentation include WQ14, WQ15, WQ16, WS1, WA24, roa2, roa3, roa4, roa7, roa12, veg4, veg9, veg12, aqu6, aqu7, aqu10, aqu11, and aqu12 and the policies and actions associated with the Fire Management Element. These policies and actions are described in previous sections.

On a program-level, implementation of the policies and management actions described above and in Section IV.D, particularly those in bold type, would reduce potential hydrologic impacts to a less than significant level. No unavoidable significant program-level sediment build-up impacts have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

REFERENCES – Hydrology and Water Quality

Except where indicated, references are on file at the San Francisco Planning Department.

California Regional Water Quality Control Board (RWQCB), *San Francisco Region, San Francisco Bay Basin Water Quality Control Plan (Basin Plan)*, 1995. (Available at www.swrcb.ca.gov/~rwqeb2/basinplan)

Camp Dresser & McKee, *Water Quality Planning Study*, Phase IV, Summary Report, Section 5, December 1995.

Chen, Carl W., Systech Engineering, Inc., *Technical Memorandum No. 3: Sediment Yields of Alameda and Peninsula Watersheds*, Appendix C-4 of the *Peninsula Watershed Management Plan*, 1994.

EDAW, Inc., prepared for San Francisco Public Utilities Commission, *Fifield/Cahill Ridge Trail Element*, 1998.

**TABLE III.D-5
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 ^a	Policies or Management Actions that could be Required to Reduce Potential Physical Effects	
	Policy or Action ^{a,b}	Level of Significance if Implemented
Tables III.D-2 through III.D-4 list the actions that could result in erosion and sedimentation, thereby resulting in potential impacts due to build-up of sediments.	Policies WQ14 , WQ15 , WQ16 , WS1 , WA24 and Actions roa2 , roa3 , roa4 , roa7 , roa12 , veg4 , veg9 , veg12 , aqu6 , aqu7 , aqu10 , aqu11 , and aqu12 and the policies and actions associated with the Fire Management Element.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

Environmental Science Associates, prepared for San Francisco Water Department, *Peninsula Watershed Natural and Cultural Resources*, Appendix A-4 of the *Peninsula Watershed Management Plan*, 1994.

Johnson, Karen, Montgomery Watson, *Technical Memorandum No. 1: San Francisco Water System Facilities and Practices*, Appendix C-2 of the *Peninsula Watershed Management Plan*, 1993.

E. NATURAL RESOURCES

1.0 SETTING

Located within the San Francisco Bay Area biological subregion, the Peninsula Watershed comprises 23,000 acres of California's geologically complex Coastal Range. Housing development and unincorporated private land encircle the area, but the Watershed lands have remained relatively undisturbed by urban development. The Peninsula Watershed has the highest concentration of rare, threatened, and endangered species in the nine-county Bay Area. The Watershed has not experienced an episodic, natural fire in over 100 years. Thus, litter (decaying organic matter on the forest floor) and vegetation densities have steadily increased, and natural processes and patterns have shifted over time. The soils are derived from heterogeneous parent materials and support not only diverse habitats, but also include isolated islands of unique plant and animal assemblages.

The Watershed possesses important regional habitat for wildlife and fish species and has been designated as both a fish and a game refuge by the California Department of Fish and Game (CDFG). The Watershed functions as a wildlife travel corridor and as a stopover along the Pacific flyway, and provides foraging grounds and dens for wildlife. Wildlife species use different habitats in accordance with their life cycle stage; therefore, migration, dispersal distances, and preferential habitats are critical to species for survival. For some wildlife, the size and/or quality of the habitat may affect its survival; thus, a change in habitat size and/or quality could adversely affect the species. For other wildlife species, the distribution of prey is an important factor for survival.

For fish species, the four reservoirs, San Andreas Lake, Lower Crystal Springs, Upper Crystal Springs, and Pilarcitos Lake (and their tributaries), serve as habitat in the Watershed. Water originating in the Sierra Nevada is imported into Upper Crystal Springs Reservoir via the Hetch Hetchy Aqueduct. Lower Crystal Springs Reservoir is filled by water from Upper Crystal Springs that flows through discharge tunnels in the dam separating the two reservoirs. San Andreas Reservoir receives water from local runoff, a diversion from Pilarcitos Reservoir, and pumping from Upper and Lower Crystal Springs Reservoirs. Pilarcitos Reservoir receives water entirely from local runoff. Though there are more non-native fish species within these reservoirs (e.g., mosquitofish and largemouth bass), native fish species such as rainbow trout and stickleback occur as well. The unregulated perennial streams which flow into San Andreas, Lower Crystal Springs, and Pilarcitos Reservoirs may contain native fish species (e.g., rainbow trout, threespine stickleback, and Sacramento suckers) that originated from populations that were present prior to construction of the reservoirs.

1.1 SPECIAL-STATUS SPECIES DEFINITION

Several species known to occur on or in the vicinity of the Watershed are accorded "special status" because of their recognized rarity or vulnerability to various causes of habitat loss or population decline. Some of these species are listed and receive specific protection defined in

federal or state endangered species legislation. Other species have not been formally listed as threatened or endangered, but have designations as “rare” or “sensitive” on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as “special-status species” in this EIR, following a convention that has developed in practice but has no official sanction. For the purposes of this document, special-status species are defined by the following sources:

- the California Native Plant Protection Act (Fish and Game Code § 1900 *et seq.*) protects endangered and “rare” species, subspecies, and varieties or plants;
- the California Endangered Species Act lists plants and wildlife as threatened or endangered (Fish and Game Code § 2070);
- the Federal Endangered Species Act, the Secretary of Commerce, and the Secretary of the Interior list plants and wildlife as threatened or endangered (16 USC. § 1533[a]; 16 USC § 1533 [a] [2]; 16 USC § 1533 [c] [1]);
- CEQA Guidelines, Section 15380, includes plants and wildlife that may be considered rare or endangered if the species meets certain specified criteria;
- the California Native Plant Society (CNPS) lists plants as rare, threatened, or endangered;
- the California Department of Fish and Game designates plants and wildlife as “species of special concern” and prohibits the destruction of nests and eggs of any bird (Section 3503);
- the Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading of migratory non-game birds;
- the California Fish and Game Code (Sections 3511 [birds], 5050 [reptiles and amphibians], and 4700 [mammals]) designates listed wildlife as fully protected in California;
- the federal Bald Eagle Protection Act (16 USC § 668 *et seq.*) prohibits persons within the United States (or places subject to U.S. jurisdiction) from “possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or golden eagle, alive or dead, or any part, nest, or egg thereof;
- “Special Animals” is a general term that refers to all taxa the CDFG Natural Diversity Data Base (NDDDB) tracks, regardless of their legal or protection status. The term does not offer further protection beyond the legal or protection status that may apply; and
- the California Fish and Game Code (Section 4800) designates the mountain lion (genus *Felis*) as a specially protected mammal. It is unlawful to take, injure, possess, transport, import, or sell mountain lion or any part or product thereof, except as specially provided.

1.1 VEGETATION

Sixteen different plant communities (types of plants that tend to occur together) are present in the Watershed, including a mosaic of grasslands, scrub and chaparral, hardwood and softwood woodlands and forests, freshwater marshes, and urban and cultivated areas. Of these plant communities, nine are considered endangered, sensitive, or rare under state and/or county

regulations because of their limited distribution either locally or regionally. The rare plant communities of the Watershed are valley needlegrass grassland, serpentine bunchgrass grassland, northern maritime chaparral, Douglas fir forest/upland redwood forest, freshwater marsh, central coast arroyo willow riparian forest, central coast live oak riparian woodland, white alder riparian forest, and coastal deciduous woodland stream.

In addition to individual rare plant species, the CDFG lists rare plant communities which are afforded consideration under CEQA if local jurisdictions consider them to have value and create policy to protect them. A general description of each plant community in the Watershed follows. For a complete description of these plant communities, refer to *Peninsula Watershed Natural and Cultural Resources* (Environmental Science Associates, 1994).

Grassland Communities

About 2,500 acres of grass-dominated areas are located on the Watershed. There are three types of grasslands that occur on the Watershed: serpentine bunchgrass grassland, valley needlegrass grassland, and non-native grassland. The distribution of these grassland communities is dependent primarily on the composition and depth of the soil and on past and ongoing disturbance.

Serpentine bunchgrass grassland occurs in various areas throughout the Watershed. This community can be found on the gently undulating terraces of Buri Buri Ridge (east of Crystal Springs and San Andreas Lakes), and at elevations of 900 to 1,200 feet on the broad flat ridges of Fifield Ridge, Spring Valley Ridge, and northern Cahill Ridge. The majority of this community is made up of purple needlegrass (*Nassella pulchra*), California oatgrass (*Danthonia californica*), Terrey's melic grass (*Melica torreyi*), June grass (*Koeleria macrantha*), and ryegrass (*Lolium multiflorum*). Numerous serpentine-tolerant wildflowers, such as tidy tips (*Layia platyglossa*), yellow Mariposa lily (*Calochortus luteus*), and Kellogg's yampah (*Perideridia kelloggii*), occur between the tufts of grass.

Valley needlegrass grassland consists primarily of herbaceous perennial plants and is found along the relatively flat top of Sawyer Ridge. This grassland contains a rich variety of grasses that includes California oatgrass (*Danthonia californica*), blue wild ryegrass (*Elymus glaucus*), purple needlegrass (*Nassella pulchra*), California brome (*Bromus carinatus*), and Idaho fescue (*Festuca idahoensis*). Associated herbaceous species include California poppy (*Eschscholzia californica*), soap root (*Chlorogalum pomeridianum*), squirreltail grass (*Elymus elymoides*), and California man-root (*Marah fabaceus*).

Non-native grasslands are composed of predominantly annual grasses that include vulpia (*Vulpia myuros*), soft chess (*Bromus hordaceus*), and herbaceous plants. Species associated with this community include some native species such as coyote brush (*Baccharis pilularis*), California buttercup (*Ranunculus californica*), goldfields (*Lasthenia californica*), and several species of owl's clover (*Castilleja* spp.¹).

¹ "spp." considers all species within a genus.

Scrub and Chaparral Communities

Many species of chaparral are fire-dependent and only germinate after a fire. There are three types of chaparral in the Watershed, northern maritime chaparral, chamise chaparral, northern mixed chaparral; and one type of scrub, northern coastal scrub.

Northern maritime chaparral is found on the Oligocene marine sandstone of Montara Mountain (Corelli, 1991). This community requires sandy substrates within the coastal fog drip zone and consists of Montara manzanita (*Arctostaphylos montarensis*), a federal species of concern, common manzanita (*A. glandulosa*), coyote brush (*Baccharis pilularis*), ceanothus (*Ceanothus cuneatus* and *C. thrysiflorus*), and huckleberry (*Vaccinium ovatum*).

Chamise chaparral (*Adenostoma fasciculatum*) is associated with hot, xeric (i.e., dry) sites (south- and west-facing slopes and ridges) and includes various fire-adapted species such as manzanita (*Arctostaphylos* sp.²), ceanothus species (*Ceanothus* sp.), yerba santa (*Eriodictyon californicum*), and deer brush (*Lotus scoparius*). The canopy is dense and has no understory and very little litter. As typical of many fire-dependent communities, chamise chaparral becomes senescent (i.e., approaches death) in the absence of disturbance.

Northern mixed chaparral is composed of broad-leafed, sclerophyll (i.e., hardened, tough leaves) shrubs, such as manzanita and ceanothus species, that form a dense, often impenetrable canopy. Roughly 10 percent of the Watershed consists of chaparral, which is usually found on dry, rocky, east-facing steep slopes and exposed ridges with little soil. Species in this community include coyote brush (*Baccharis pilularis*), coast live oak (*Quercus agrifolia*), chamise (*Adenostoma fasciculatum*), western poison oak (*Toxicodendron diversilobum*), yerba santa, oceanspray (*Holodiscus discolor*), and holly leaf cherry (*Prunus ilicifolia*). This vegetation type is found on the east-facing slopes above the northern end of San Andreas Lake, along east-facing slopes above both Upper and Lower Crystal Springs Lakes, and on both east- and west-facing sides of Cahill Ridge.

Northern coastal scrub consists of dense to moderately open shrub canopy with a sparse herbaceous understory. Roughly 29 percent of the Watershed consists of northern coastal scrub areas. The dominant shrub in this community is coyote brush (*Baccharis pilularis* var. *consanguinea*). Other common shrubs include western poison oak (*Toxicodendron diversilobum*) and California coffeeberry (*Rhamnus californica*). The understory consists of cow parsnip (*Heracleum lanatum*), false Solomon's seal (*Smilacina stellata*), California figwort (*Scrophularia californica*), and soap plant (*Chlorogalum pomeridianum*). In some areas, Douglas fir trees (*Pseudotsuga menziesii*) and coast live oak invade this community.

Woodland and Forest Communities

On the Peninsula Watershed, three upland communities are found: mixed evergreen forest / coast live oak woodland, Douglas fir forest / upland redwood forest, and non-native (exotic) forest.

² "sp." considers any species within a genus and does not specify a particular species.

Three riparian communities are found: central coast arroyo willow riparian forest, white alder riparian forest, and central coast live oak riparian forest.

Mixed evergreen forest / coast live oak woodland is found on moist, well-drained slopes with coarse soils. Species that make up this community include coast live oak (*Quercus agrifolia*), madrone (*Arbutus menziesii*), and California bay (*Umbellularia californica*). Chinquapin (*Chrysolepis chrysophylla*), tanbark oak (*Lithocarpus densiflora*), Douglas fir (*Pseudotsuga menziesii*), and canyon oak (*Quercus chrysolepis*) occur within the community at higher elevations along the southern end of the Watershed above the Filoli Estate.

Douglas fir forest / upland redwood forest occurs on the northeast-facing slopes above San Mateo and Pilarcitos Creeks, and in small amounts on Cahill Ridge. Young and old-growth Douglas fir trees (*Pseudotsuga menziesii*) occupy about 2,594 acres of the Watershed. An estimated 270 acres of mixed Douglas fir forest / upland redwood forest are present where young redwoods (*Sequoia sempervirens*) are dominant. Associate species include Douglas fir, tan oak, and madrone. Redwoods occur on about 290 acres of this community type within the Watershed.

Non-native (exotic) forests occupy about 543 acres of the Watershed. These forests are composed of Eucalyptus (*Eucalyptus* sp.), Monterey cypress (*Cupressus macrocarpa*), and Monterey pine (*Pinus radiata*). Monterey cypress and Monterey pine are native species to the Monterey peninsula of California, but are invasive and aggressive throughout the rest of California. These stands occur on east-facing slopes above Upper Crystal Springs Reservoir and on the west-facing slope above Lower Crystal Springs Reservoir. Eucalyptus stands occur on the east side of San Andreas Lake and at the southern intersection of Cañada Road and I-280.

Central coast arroyo willow riparian forest occurs in moist canyons with perennial, or at least intermittent, stream flow. Below a spring at the headwaters of San Mateo Creek, willows are associated with California wax myrtle (*Myrica californica*), coyote brush (*Baccharis pilularis*), Douglas' baccharis (*Baccharis douglasii*), blackberry, rush (*Juncus* sp.), and sword fern (*Polystichum munitum*).

White alder riparian forests are supported along the banks of rapidly flowing, perennial streams such as Pilarcitos Creek and San Mateo Creek. The white alder riparian forest community found along Pilarcitos Creek is dominated by coastal red alder (*Alnus rubra*), a closely related species. White alders (*Alnus rhombifolia*) are strongly associated with big-leaf maple (*Acer macrophylla*). Its understory includes woody and herbaceous plants such as arroyo willow (*Salix lasiolepis*), elderberry (*Sambucus mexicana*), sword fern (*Polystichum munitum*), chain fern (*Woodwardia finbriata*), bleeding heart (*Dicentra formosa*), and red larkspur (*Delphinium nudicale*).

Coast live oak riparian forest is usually found on ephemeral stream courses and is the driest of the three riparian natural communities. In the Watershed, coast live oak is the dominant tree in this community and includes an understory of western poison oak (*Toxicodendron diversilobum*), blackberry (*Rubus ursinus*), mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis*), snowberry (*Symphoricarpos mollis*), and elderberry (*Sambucus mexicana*). This

community is found at the southern end of Upper Crystal Springs Lake along active and abandoned creek channels.

Freshwater Marsh-Wetland Communities

Freshwater marsh-wetland occurs at the Skyline Quarry, near Mud Dam Pond, and Pilarcitos Reservoir. The marsh-wetlands at the Skyline Quarry contain a low-diversity assemblage of willows (*Salix* sp.), sedges (*Carex* spp.), and rushes (*Juncus* spp.). Although the colonizing plants that grow in these marshes are not rare, the plant community has been disappearing in California due to increased pressure for conversion to agricultural and urban uses. Freshwater marshes also support a large number of animal species, many of which have special status because of population declines due to loss of habitat, such as the federal and state endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*).

Urban and Cultivated Areas

Urban areas are highly disturbed and consist of ornamental trees, landscaping plants, and rural vegetable gardens. **Cultivated areas** occur on flat and gently rolling hills and include hay, non-native grasslands, orchards, nurseries, and vineyards.

Invasive Plant Species

Invasive plant species are non-natives that have established viable populations in the community. These species invade native communities, rapidly colonize disturbed and undisturbed sites, and compete with native species for available resources. As a result, invasive species decrease biodiversity by forming monocultures, displace native species, and typically do not provide habitat for native wildlife species.

- Invasive species known to occur in the Watershed include pampas grass (*Cortaderia jubata*) in some open road cuts on Fifield Ridge, Australian fireweed (*Erechtites minima*) in the Five Points area, and hawthorn (*Crateagus monogyna*) on the Cahill Ridge service road. Gorse (*Ulex europaea*), french broom (*Genista monspessulana*), cape ivy (*Delairea odorata*), and purple star thistle (*Centaurea calcitrapa*) are also invasive plants found within the Watershed. Watershed staff frequently remove pampas grass by cutting. There is an established program for controlling invasive species; however, due to funding and resource limitations, the effectiveness of the program is limited.

Special Status Species

Table III.E-1 lists special-status plant species known to occur on the Watershed or that have a high or moderate potential to occur based on the distance to the nearest documented occurrence and habitat requirements. Appendix X.I.C includes a list of all sensitive species known to occur or with the potential to occur in the Watershed vicinity. The lists were compiled using the California Diversity Data Base (CDFG, 1998) search by quadrangle (i.e., Montara Mountain, Woodside, and San Mateo quadrangles), California Native Plant Society Electronic Inventory

(CNPS, 1998) search by quadrangle (i.e., Montara Mountain, Woodside, and San Mateo quadrangles), and other data sources (i.e., Environmental Science Associates, 1994, 1998;

**TABLE III.E-1
SPECIAL-STATUS PLANT SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Flowering Period
San Mateo thorn-mint <i>Acanthomintha duttonii</i>	FE/CE/1B	Grassland and chaparral, on serpentinite	Found in "Triangle" a,b	April-June
Coast rock cress <i>Arabis blepharophylla</i>	FC3c/--/4	Broadleaved upland forests, coastal prairie, coastal scrub; often in rocky places	Found ^{b,d}	February-April
San Bruno Mtn. Manzanita <i>Arctostaphylos imbricata</i>	FSC/CE/1B	Chaparral, coastal scrub	Found ^{b,d}	February-May
Montara manzanita <i>Arctostaphylos montaraensis</i>	FC/--/1B	Maritime chaparral, coastal scrub	Found ^{a,b}	January-March
Brewer's calandrinia <i>Calandrinia breweri</i>	--/--/4	Burns and disturbed areas in coastal scrub and chaparral	Moderate Potential ^c	March-June
Robust spineflower <i>Chorizanthe robusta</i> var. <i>robusta</i>	FPE/--/1B	Coastal scrub, coastal dunes, openings in oak woodlands	Moderate Potential ^c	May-September
Fountain thistle <i>Cirsium fontinale</i> var. <i>fontinale</i>	FE/CE/1B	Grassland and openings in chaparral, in serpentinite seeps	Found on Pulgas Ridge ^b	June-October
Mountain lady's-slipper <i>Cypripedium montanum</i>	FC3c/--/4	Broadleaved upland forests, lower montane coniferous forests	Moderate Potential ^c	March-July
Western leatherwood <i>Dirca occidentalis</i>	--/--/1B	Broadleaved upland forests, closed-cone coniferous forests, chaparral, cismontane woodland, North coast coniferous forests, riparian forests, riparian woodland; mesic sites	Found in many communities ^e	January-April
California bottle-brush grass <i>Elymus californicus</i>	FC3c/--/4	North coast coniferous forests	Occurs on Cahill Ridge ^{b,c}	June-August
Marsh horsetail <i>Equisetum palustre</i>	--/--/3	Marshes	Moderate Potential ^c	NK
Tiburon buckwheat <i>Eriogonum luteolum</i> var. <i>caninum</i>	FC3c/--/3	Chaparral, coastal prairie, grasslands, usually on serpentinite	High Potential ^c observed in coastal scrub	June-September
San Mateo woolly sunflower <i>Eriophyllum latilobum</i>	FE/CE/1B	Cismontane woodland, on serpentinite, often on roadcuts	Found along Crystal Sps. Rd. ^{a,b,f}	May-June

**TABLE III.E-1 (Continued)
SPECIAL-STATUS PLANT SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Flowering Period
San Francisco wallflower <i>Erysimum franciscanum</i>	FSC/--/4	Coastal dunes, coastal scrub, grasslands, often on serpentinite or granitic soils	Found throughout grassland ^b	March-June
Stink bells <i>Fritillaria agrestis</i>	--/--/4	Valley and foothill grasslands, oak woodlands; on clay flats; sometimes on serpentine	Low-Moderate Potential ^c	March-April
Fragrant fritillary <i>Fritillaria liliacea</i>	FSC/--/1B	Coastal scrub, valley and foothill grassland, coastal prairie; on heavy clay soils, often on ultramafic soils	Found on Pulgas Ridge ^b	February-April
Diablo rock-rose <i>Helianthella castanea</i>	FSC/--/1B	Openings in chaparral and broadleaved upland forest	Low-moderate ^c Potential	April-June
Marin dwarf flax <i>Hesperolinon congestum</i>	FT/CT/1B	Grassland and openings in chaparral, often on serpentinite	Found on Pulgas and Buri Buri Ridges ^b	May-July
Kellogg's horkelia <i>Horkelia cuneata</i> ssp. <i>sericea</i>	FSC/--/1B	Closed-cone coniferous forests, coastal scrub	Low-Moderate Potential ^c	April-September
Bristly linanthus <i>Linanthus acicularis</i>	--/--/4	Chaparral, cismontane woodland, coastal prairie	Low-Moderate Potential ^c	April-July
Large-flower linanthus <i>Linanthus grandiflorus</i>	--/--/4	Coastal bluff scrub, closed-cone coniferous forests, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, grasslands	Low-Moderate Potential ^c	April-July
San Mateo tree lupine <i>Lupinus eximius</i>	FSC/--/3	Chaparral and coastal	Found ^b	April-July
Arcuate bush mallow <i>Malacothamnus arcuatus</i>	--/--/4	Chaparral	Found ^c	April-July
Dudley's lousewort <i>Pedicularia dudleyi</i>	FSC/CR/1B	North Coast coniferous forests, maritime chaparral, grasslands, sometimes in disturbed sites	High Potential ^c	April-June
● White-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE/CE/1B	Grasslands, serpentinite soils, dry rocky slopes	Found in triangle area ^c	March-May
Gaardner's yampah <i>Perideridia gaardneri</i> ssp. <i>gaardneri</i>	FSC/--/4	Broadleaved upland forests, chaparral, grasslands, vernal pools, usually in mesic sites	Moderate Potential ^c	June-October

**TABLE III.E-1 (Continued)
SPECIAL-STATUS PLANT SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Flowering Period
Choris's popcorn-flower <i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	--/--/3	Chaparral, coastal prairie, coastal scrub, on mesic sites	Moderate Potential ^c	April-June
Hickman's cinquefoil <i>Potentilla hickmanii</i>	FPE/CE/1B	Coastal bluff scrub, closed- cone coniferous forests, meadows and marshes, mesic sites	Moderate Potential ^c	April- August
● San Francisco collinsia <i>Collinsia multicolor</i>	--/--/4	Closed-cone coniferous forests, coastal scrub, and moist, shady coast live oak woodland	High ^g Potential	March-May
● Hillsborough chocolate lily <i>Fritillaria biflora</i> var. <i>ineziana</i>	--/--/1B	Cismontane woodland, grassland, on serpentinite	Found on Buri Buri Ridge in serpentine grassland ^g	March-April
● San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	FSC/--/1B	Coastal bluff scrub, coastal scrub, grasslands, on sandy or serpentinite soils	High Potential ^g	August- September
● Crystal Springs lessingia <i>Lessingia arachnoidea</i>	FSC/--/1B	Cismontane woodland, coastal scrub, grasslands, on serpentinite, often on roadcuts	Found on Pulgas Ridge ^g	July-October
● Serpentine linanthus <i>Linanthus ambiguus</i>	--/--/4	Cismontane woodland, coastal scrub, grassland, usually on serpentinite	High Potential ^g	March-June
● Hickman's cinquefoil <i>Potentilla hickmanii</i>	FPE/CE/1B	Coastal bluff scrub, closed- cone coniferous forests, meadows and marshes, mesic sites	High Potential ^g	April- August

● Federal Categories (U.S. Fish and Wildlife Service)
 FE = Listed as Endangered by the Federal Government
 FT = Listed as Threatened by the Federal Government
 FPE = Proposed for Listing as Endangered
 FPT = Proposed for Listing as Threatened
 FC = Candidate for Federal Listing
 FSC = Federal Species of Concern (former Category 2
 Candidate)
 FC3c = Species removed from listing

California Native Plant Society (CNPS)
 List 1A = Plants presumed extinct in California
 List 1B = Plants rare, threatened, or endangered in
 California and elsewhere
 List 2 = Plants rare, threatened, or endangered in
 California but more common
 List 3 = Plants about which more information is needed
 List 4 = Plants of limited distribution

State Categories (California Department of Fish and Game)

CE = Listed as Endangered by the State of California
 CT = Listed as Threatened by the State of California
 CR = Listed as Rare by the State of California

- a CDFG, 1998.
- b Corelli, T., 1991.
- c Environmental Science Associates, 1998.
- d Environmental Science Associates, 1994.
- e Oberlander, G. T., 1953.
- f The Nature Conservancy, 1990.
- g California Native Plant Society, 2000.
- h National Park Service, 2000.

High Potential = Species expected to occur and meets all habitats as defined in list.

Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.

Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.

-- = No listing status; NK = Not known, information unavailable.

SOURCE: Environmental Science Associates, 1994, 1998; CDFG, 1998; CNPS, 1998

Hickman, 1993; The Nature Conservancy, 1990; Corelli, 1991; and Oberlander, 1953). Seven of these species have formal listings as endangered or threatened under the California Endangered Species Act or Federal Endangered Species Act. These species include San Mateo thornmint, fountain thistle, San Mateo woolly sunflower, Marin dwarf flax, white-rayed pentachaeta, San Bruno Mountain manzanita, and Hickman's cinquefoil. All the species have been observed within the Watershed, except Hinkman's cinquefoil, which has a moderate potential to occur.

San Mateo thornmint (*Acanthamintha duttonii*). The species is an annual native found only in San Mateo County's serpentine bunchgrass grasslands. There are only two known areas where this species is found. One of these locations is at the intersection of Edgewood Road, Cañada Road, and I-280 west of Upper Crystal Springs Reservoir (also known as the "triangle"). This area contains high-quality serpentine bunchgrass grassland. This species is state and federally endangered and is a CNPS List 1B plant.

Fountain thistle (*Cirsium fontinale* var. *fontinale*). This species is a tall (up to 6 feet) plant thinly covered with sticky, matted hairs, and is slightly reddish tinged with dull white to pink flowers surrounded by purple, recurved bracts. Fountain thistle has been found in the "triangle" and on Pulgas Ridge within the Peninsula Watershed (Corelli, 1991) and in the vicinity of Crystal Springs Reservoir (CNPS, 1998). It is threatened by introduced species invasion and road maintenance. Fountain thistle possibly hybridizes with brownie thistle (*Cirsium quercetorum*). This species is federally and state endangered and is a CNPS List 1B plant.

San Mateo woolly sunflower (*Eriophyllum latilobum*). This bushy, perennial plant occurs in sparsely wooded, rocky, or grassy slopes in mixed evergreen forest / coast live oak woodland and is commonly found growing under coast live oak. A species of limited distribution, the San Mateo woolly sunflower occurs only in the Crystal Springs region. This species is state and federally endangered and is a CNPS List 1B plant.

- **Marin dwarf flax** (*Hesperolinon congestum*). Marin dwarf flax is a herbaceous annual species that has eight reported sites within the Peninsula Watershed boundaries, including one site on the ridge above Lower Crystal Springs Reservoir; one site at the road embankment north of Crystal Springs Dam (the site has been altered by road work, and the population considered extirpated); one site on the east side of Upper Crystal Springs Reservoir; one site on the west of Cañada Road; one site south of I-280; two sites discovered in 1989 downslope of I-280; and in serpentine bunchgrass grassland and barren areas throughout Pulgas Ridge. This species is state endangered, federally threatened, and a CNPS List 1B plant.
- **White-rayed pentachaeta** (*Pentachaeta bellidiflora*). This small annual was identified in the serpentine bunchgrass grassland "triangle" area by Corelli (1991). White-rayed pentachaeta has a limited range, but is densely present where it occurs in the triangle area. In addition, Munz and Keck reported that it occurs in northern coastal scrub and coastal prairie grassland (1970). This species is federally and state endangered and a CNPS List 1B plant.

San Bruno Mountain manzanita (*Arctostaphylos imbricata*). This perennial shrub occurs in chaparral and coastal scrub communities. It is only known from a few occurrences that include San Bruno Mountain and San Mateo County and was last observed in 1981 (CDFG, 1998). Corelli (1991) observed this species in the Watershed, in sandstone outcrops of chaparral community. This species is state endangered, a federal species of concern, and a CNPS List 1B plant.

Hickman's cinquefoil (*Potentilla hickmanii*). This perennial herb occurs in coastal bluff scrub, mesic meadows, marshes, and swamps. There are no documented occurrences of this species in the Watershed, but suitable habitat for this species does exist. The closest site with known occurrences of this species was documented north of Moss Beach at Half Moon Bay. However, this plant is believed to be extirpated from this site due to developmental pressures and eroding soils (CNPS, 1998; CDFG, 1998). This species is a CNPS List 1B, state endangered, and federally proposed as endangered.

1.3 WILDLIFE

There are 18 types of wildlife habitats found in the Watershed. These wildlife habitats are based on the Wildlife Habitat Relationships system and generally correspond to the natural plant communities discussed in the previous section. Table III.E-2 cross-references the various natural plant communities with corresponding wildlife habitats.

A general description of each wildlife habitat found in the Watershed follows. For a complete detail of wildlife habitats found in the Watershed, refer to the *Peninsula Watershed Natural and Cultural Resources* (Environmental Science Associates, 1994).

Exotic Forest Communities

Monterey pine, Monterey cypress, and eucalyptus forests are usually monotypic (dominated by one species providing canopy, with very little undergrowth). Within the Watershed these communities occur on the west-facing slopes near Upper Crystal Springs Reservoir. The canopy of these forests offer perching and roosting sites for a variety of avian species, with raptors nesting in eucalyptus. The lack of understory growth does not provide much habitat for insects and reptiles that prey upon them, nor for mammals, except for cover and resting areas. The monarch butterfly (*Danaus plexippus*) may use these forests, especially the eucalyptus forests, for cover and thermal regulation during the winter months. Raptors use these forests for perching and roosting at night.

Forest and Woodland Communities

Douglas fir forest is a coniferous forest habitat that supports a variety of wildlife species adapted to wet environments, such as arboreal salamanders (*Aneides lugubris*) and slender salamanders (*Batrachoseps attenuatus*). This coniferous forest contains food in various forms: seeds for species such as chestnut-backed chickadee (*Parus rufescens*) and Stellar's jay (*Cyanocitta stelleri*), and insects for species such as Swainson's thrush (*Catharus ustulatus*), winter wren (*Troglodytes troglodytes*), white-breasted nuthatch (*Sitta carolinensis*), and Wilson's warbler (*Wilsonia pusilla*). Cooper's hawks (*Accipiter cooperi*) feed on these small birds and use Douglas fir forest habitat for nesting. Mammal species moving through and utilizing Douglas fir forest resources include gray fox (*Urocyon cinereoargenteus*) and black-tailed deer (*Odocoileus hemionus californicus*).

**TABLE III.E-2
PENINSULA WATERSHED WILDLIFE HABITATS**

Wildlife Habitat	Natural Plant Community
Douglas fir forest	Douglas fir forest/upland redwood forest
Exotic forest - Monterey cypress	Exotic forest - Monterey cypress
Exotic forest - Monterey pine	Exotic forest - Monterey pine
Exotic forest - eucalyptus	Exotic forest - eucalyptus
Mixed evergreen forest / coastal oak woodland	Mixed evergreen forest / coastal oak woodland
Willow riparian forest	Central coast arroyo willow riparian forest
Coast live oak riparian forest	Central coast live oak riparian forest
Willow riparian forest	White alder riparian forest
Coastal scrub	Northern (Franciscan) coastal scrub
Coastal scrub	Northern coastal scrub with trees
Coastal scrub	Northern maritime chaparral
Mixed chaparral	Northern mixed chaparral
Chamise chaparral	Chamise chaparral
Perennial grassland	Valley needlegrass grassland
Serpentine barrens	Serpentine bunchgrass grassland
Annual grassland	Non-native grassland
Freshwater emergent wetland	Coastal and valley freshwater marsh
Pond or reservoir	(None)
Pasture	Cultivated
Urban	Urban/bare

SOURCE: Environmental Science Associates, 1994

Mixed evergreen forest / coastal oak woodland is composed of a hardwood tree layer, ranging in height from 60-90 feet, with a patchy herbaceous stratum and sparse shrub layer. Snags and downed woody material are generally sparse throughout. Mixed evergreen forests contain food for species such as chestnut-backed chickadee, Steller’s jay, pygmy nuthatch (*Sitta pygmaea*), and warbling vireo (*Vireo gilvus*). These species are bark gleaners; they eat insects that are in the bark of trees, and catch insects in flight. The rufous-sided towhee (*Pipilo crissalis*) and brown towhee (*Pipilo fuscus*) glean insects from the foliage on the ground, such as under leaf litter and plants. Rufous hummingbirds (*Selasphorus rufus*) rely on vines growing around trees for nectar and for insects that are attracted to the nectar. Other species, such as the great horned owl (*Bubo virginianus*) and Cooper’s hawk, use the tall trees as roosting and foraging sites during the day. The western gray squirrel (*Sciurus griseus*) and gray fox both feed on truffles, mushrooms, fruits, and nuts within the forest. Special status species potentially occurring in this habitat are Cooper’s hawk and sharp-shinned hawk (*Accipiter striatus*).

Riparian Forest Communities

Willow riparian is a moist-to-wet habitat type, characterized by high growth or primary productivity. Decay organisms and larvae found in damp litter feed insects and other small animals, which in turn support a complex food web. This habitat is an important breeding habitat for amphibians. The physical structure of the trees provides a protected travel corridor between aquatic and upland habitat types, and is an important feeding and resting place for resident and migratory birds. Shorelines provide habitat for feeding and nesting for various special-status species, particularly the state and federal endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), and are sensitive to human disturbance. This habitat is also vulnerable to introductions of exotic animals, such as bullfrog (*Rana catesbeiana*), which compete with or are predators of native amphibians and reptiles.

Coast live oak riparian is an open, low, evergreen forest similar in most respects to the adjacent upland woodland. As with other riparian habitats, coast live oak riparian provides water, foraging, nesting, cover, and migrating and dispersal corridors for a variety of wildlife species. The primary distinguishing attribute of this habitat type is its topographic configuration along incised drainages, and the presence of seasonal water, which increases biological productivity. Common insect eaters and foliage gleaners include ash-throated flycatcher (*Myiarchus cinerascens*), plain titmouse (*Parus inornatus*), and dark-eyed junco (*Junco hyemalis*). Bark gleaner species, such as scrub jay (*Aphelocoma coerulescens*), Steller's jay, and acorn woodpecker (*Melanerpes formicivorus*), feed on insects as well as acorns. California quail (*Callipepla californica*) and brown towhee are ground foliage gleaners in this habitat. Red-shouldered hawks (*Buteo lineatus*) forage on small mammals in the adjacent grassland. Cooper's hawks and sharp-shinned hawks are often associated with this habitat and are known to hunt small birds. Mammals such as gray squirrel forage and nest in the canopy of the trees, while long-tailed weasels (*Mustela frenata nevadensis*) hunt for shrews (*Sorex* spp.) and meadow voles (*Microtus* sp.) on the ground.

White alder riparian forest occurs along Pilarcitos Creek. Wildlife habitat values are equivalent to willow riparian, as both habitats have a dense canopy for cover, moist environment for insects and foraging, and are located along streams. Special-status species potentially found in this habitat are San Francisco fork-tailed damselfly (*Ischnura gemina*), northwestern pond turtle (*Clemmys marmorata marmorata*), San Francisco garter snake, California red-legged frog (*Rana aurora draytonii*), sharp-shinned hawk, and foothill yellow-legged frog (*Rana boylei*).

Scrub and Chaparral Communities

Coastal scrub habitat is open and low in profile, with extensive shrubby vegetation usually seen on the west-facing slopes and along Fifield Ridge within the Watershed. The sandy soils often associated with coastal scrub habitat provide ideal habitat for reptiles, such as western fence lizards, that burrow underground. Coastal scrub habitat, often interspersed with other habitats, provides foraging and nesting areas for species that are attracted to community edges, including California quail, mourning dove (*Zenaidura macroura*), and rufous-sided towhee. These birds forage for invertebrates among the leaf litter. Avian species that use the canopy of the scrub for

catching insects include Pacific slope flycatcher (*Empidonax difficilis*), Wilson's warbler, and wrentit (*Chamaea fasciata*). Besides insects, flowering scrub vegetation (e.g., *ceanothus* or deerbrush) attracts nectar drinkers such as Anna's hummingbird (*Calypte anna*). Cooper's hawks hunt smaller birds from the adjacent Douglas fir forest. Mammals, including striped skunk (*Mephitis mephitis*), use this habitat for protection and foraging grounds and feed on new plant shoots. Black-tailed deer often feed in coastal scrub, foraging on deerbrush in the winter and huckleberry in the spring. Small mammals occurring within coastal scrub include Audubon's cottontail (*Sylvilagus audubonii*), Botta's pocket gophers (*Thomomys bottae*), and deer mice (*Peromyscus maniculatus*). Small mammals attract predators such as gray fox and bobcat (*Felix rufus*).

Mixed chaparral is a community dominated by shrubs with thick stiff evergreen leaves and contains foraging and nesting habitat for species that are attracted to the edges of the adjacent grassland and oak forest communities. These species include mountain quail, California quail, California thrasher, mourning dove, and rufous-sided towhee. Avian species that use the canopy of the chaparral for catching insects include phainopepla, ash-throated flycatcher, and wrentit (*Chamaea fasciata*). Flowers of the manzanita and ceanothus attract nectar drinkers such as Anna's hummingbird. If cliffs are located nearby, prairie falcons will use chaparral for foraging grounds, as will sharp-shinned hawks, if water is also nearby. Mammals use this habitat for protection and foraging grounds, and feed off new shoots of plants. These species include brush rabbits (*Sylvilagus bachmani*), gophers, and deer mice (*Peromyscus* spp.). Small mammals attract predators such as long-tailed weasel (*Mustela frenata nevadensis*), gray fox, red fox (*Vulpes fulva*), and bobcat (*Lynx rufus*). Western rattlesnakes (*Crotalus viridis*) and western fence lizards (*Sceloporus occidentalis*) inhabit the warm, dry chaparral community.

Chamise chaparral is associated with hot, xeric sites (south- and west-facing slopes and ridges) and includes fire-adapted species. It does not contain the same diversity of wildlife food found in coastal scrub. Wildlife species use chamise chaparral for cover and movement corridors. The canopy is too low (3 to 6 feet) and dense for nesting raptors. Predators, such as gray fox or bobcat, prey on small mammals along the edges of the habitat. This habitat provides cover and foraging opportunities for reptiles.

Grassland

Annual grassland is open grassland composed primarily of annual plant species and is an important habitat for species that require an unobstructed line-of-sight for courtship, hunting, and territorial defense. California quail, mourning dove, and meadowlarks are a few seed eaters that use grasslands for nesting. Insect eaters such as scrub jays (*Aphelocoma coerulescens*), barn swallows (*Hirundo rustica*), and mockingbirds (*Mimus polyglottus*) use the habitat for foraging only. Mammals such as the California vole (*Microtus californicus*), deer mouse (*Peromyscus maniculatus*), broad-footed mole (*Scapanus latimanus*), and black-tailed jackrabbit (*Lepus californicus*) forage and nest within the grassland. Mule deer (*Odocoileus hemionus*) will use grassland for grazing and for bedding at night. Small rodents are prey for owls and hawks. California ground squirrels (*Citellus beecheyi*), attracted to the short grasses for safety reasons, create burrows that are important habitat for various species, such as burrowing owls (*Speotyto*

cunicularia) and tiger salamanders. Small, seasonal ponds that are dry in the summer and are located in the grasslands are important habitat for the California tiger salamander (*Ambystoma californiense*). Because of their ephemeral nature, these ponds have not been mapped.

Serpentine barrens occur on serpentine soils and are characterized by specially adapted plant species. Serpentine barrens occur on the gently undulating terraces on Buri Buri Ridge east of Crystal Springs and San Andreas Reservoirs. They are generally similar in value to grassland, but do not offer abundant cover or food for wildlife, except for a few specifically adapted invertebrates that require specialized microhabitats or food plant species.

Perennial grasslands are dominated by annual grasses and forbs and support a variety of wildlife species that use the grassland as part of the foraging complex of the more dominant coastal scrub habitat. Grassland habitat attracts reptiles such as western fence lizard, which feeds on invertebrates found within and underneath grass tussocks. This habitat also attracts avian seed eaters, such as California quail and mourning dove, as well as insect eaters, such as scrub jays and mockingbirds. Mammals such as the California vole, deer mouse, broad-footed mole, and Audubon's cottontail (*Sylvilagus audubonii*) forage and nest within grasslands. Grasslands are important foraging grounds for aerial and ground foraging insect eaters such as *Myotis* bat species and pallid bats (*Antrozous pallidus*). Small rodents attract raptors (birds of prey) such as red-tailed hawks (*Buteo jamaicensis*) and American kestrels (*Falco sparverius*).

Ponds/Reservoirs and Freshwater Emergent Wetland Communities

Pond or reservoir habitat contains standing water from either a dammed river channel or drainage into an inland depression. Sizes may vary from pond size (less than one hectare) to reservoir size (several square miles). Most permanent lake systems support fish, while intermittent forms do not. Reservoirs are very important water sources for wildlife. Nesting birds use riparian areas leading into the reservoir and freshwater emergent wetland habitat around the edges. Ponds are shallow and provide warmer waters during the spring and summer season for invertebrate, amphibian, and reptile species. The shorelines of large ponds and reservoirs are characterized by the presence of emergent vegetation and fluctuating water levels.

Fresh emergent wetland occurs between terrestrial and aquatic systems where water tables are near the surface or land is covered by shallow water, such Mud Dam Pond and Pilarcitos Reservoir. Often, wetlands form in a reservoir where a watercourse enters, for example around the northern edge of Pilarcitos Reservoir. Grass-like plants, which emerge from the water, form a dense canopy.

This habitat is one of the most productive habitats for wildlife in that it offers water, food, and cover for a variety of species. Reptiles and amphibians found in this habitat include western aquatic garter snake (*Thamnophis couchii*) and Pacific tree frogs (*Hyla regilla*). Northern harrier (*Circus cyaneus*) and killdeer (*Charadrius vociferus*) use these areas for foraging and nesting. Snowy egret (*Leucophox thula*), black-crowned night heron (*Nycticorax nycticorax*), and mallard (*Anas platyrhynchos*) also forage in this habitat. Mammals common around the upland fringes of this habitat include meadow voles (*Microtus* sp.), which forage on insects attracted to

the moist environment; raccoons (*Procyon lotor*) and striped skunk (*Mephitis mephitis*), which forage on eggs and invertebrates; and gray fox. This habitat provides important foraging and drinking areas for aerial and ground feeding insectivorous bats, such as *Myotis* species and pallid bats.

Invasive Wildlife Species

Invasive species are non-natives that have the potential to establish viable populations in the community. These species invade native communities, rapidly colonize sites, and compete for available resources with native species. As a result, invasive species displace native species. Invasive fish species in the Watershed, such as the largemouth bass and green sunfish, prey upon the native fishes. As a result, native fish populations have been reduced and, in some cases, could become extinct. In addition, slider turtles (*Pseudemys scripta*) and bullfrogs are non-native species that occur on the Watershed. Slider turtles may displace the native pond turtle, but is not known as a highly invasive species. Bullfrogs are predators of the California red-legged frog. The impact of invasive species in the Watershed is unknown.

Special-Status Wildlife Species

Table III.E-3 lists all special-status species known to occur on the Watershed or that have a high or moderate potential to occur based on distance to nearest documented occurrence and habitat requirements. Appendix XI.C includes a list of all sensitive species with the potential to occur in the Watershed vicinity. The lists were compiled using the California Natural Diversity Data Base (CDFG, 1998) search by quadrangle (i.e., Montara Mountain, Woodside and San Mateo quadrangles) and other data sources (i.e., Environmental Science Associates, 1994, 1998; Environmental Science Associates, 1994; Hickman, 1993; The Nature Conservancy, 1990; Corelli, 1991; and Oberlander, 1953). Eleven of these species have formal listings as endangered or threatened under the California Endangered Species Act or the Federal Endangered Species Act. The species are San Bruno elfin butterfly, Mission blue butterfly, callipe silverspot butterfly, Bay checkerspot butterfly, Myrtle silverspot butterfly, steelhead, California red-legged frog, San Francisco garter snake, marbled murrelet, bald eagle, and American peregrine falcon. All of the species have been observed within the Watershed, except the Myrtle silverspot butterfly and the callipe silverspot butterfly, both of which have a high potential to occur on the Watershed; the American peregrine falcon, which has a moderate potential to occur; and the spotted owl, which has a low potential to occur.

San Bruno elfin butterfly (*Callophrys mossii bayensis*). The San Bruno elfin butterfly is a federally endangered species that occurs in association with rock outcrops in coastal sage scrub or bunchgrass grassland habitats, where its sole larval foodplant, *Sedum spathulifolium*, grows. Adults nectar on *Lomatium utriculatum*, *Achillea millefolium*, *Arabis blepharophylla*, *Erysimum franciscanum*, *Ranunculus californicus*, and *Fragaria californica* (Arnold, 1983). All known populations of the butterfly are from San Mateo County. In 1977, Arnold (1978) discovered two populations in the vicinity of Montara Mountain, including one on Whiting Ridge, which is located within the Peninsula Watershed.

**TABLE III-E-3
SPECIAL-STATUS ANIMAL SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED**

Common name Scientific name	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Period of Identification
<u>Invertebrates</u>				
Opler's longhorn moth <i>Adella oplerella</i>	FSC/--	Serpentine bunchgrass grassland	High Potential	Spring
Edgewood blind harvestman <i>Calcinia minor</i>	FSC/--	Serpentine rock outcrops and barrens	High Potential	Fall-Winter
Serpentine phalangid <i>Calcina serpentina</i>	FSC/--	Serpentine rocks and barrens	High Potential	Fall-Winter
Monarch butterfly <i>Danaus plexippus</i>	--/*	Eucalyptus groves (winter sites)	Moderate Potential	Winter
Bay checkerspot butterfly <i>Euphydryas editha bayensis</i>	FT/--	serpentine bunchgrass grassland	High Potential	March-May
Mission blue butterfly <i>Icaricia icarioides missionensis</i>	FE/--	Grassland with <i>Lupinus albifrons</i> , <i>L. formosa</i> , and <i>L. varicolor</i>	High Potential	March-June
San Bruno elfin butterfly <i>Incisalia mossii bayensis</i>	FE/--	Found in coastal scrub	High Potential	March-April
San Francisco fork-tailed damsel fly <i>Ischnura gemina</i>	FSC/--	Wetlands with emergent vegetation	High Potential	April-October
San Francisco lacewing <i>Nothochrysa californica</i>	FSC/--	Grasslands	Moderate Potential	Spring
Unsilvered fritillary butterfly <i>Speyeria adiastrae adiastrae</i>	FSC/--	Found in native grasslands with <i>Viola pedunculata</i> as larval food plant	High Potential	Spring
Callipe silverspot butterfly <i>Speyeria callippe callippe</i>	FE/--	Found in native grasslands with <i>Viola pedunculata</i> as larval food plant	High Potential	Spring
Myrtle silverspot butterfly <i>Speyeria zerene myrtleae</i>	FE/--	Found in native grasslands with <i>Viola pedunculata</i> as larval food plant	High Potential	Spring
<u>Amphibians</u>				
California tiger salamander <i>Ambystoma californiense</i>	FC/CSC	Seasonal freshwater ponds with little or no emergent vegetation	Moderate Potential	November- May
California red-legged frog <i>Rana aurora draytonii</i>	FT/CSC	Freshwater ponds and slow streams with emergent vegetation for egg attachment	High Potential	April-June
Foothill yellow-legged frog <i>Rana boylei</i>	FSC/CSC	Streams with quiet pools absent of predatory fish	High Potential	April-June
Western spadefoot toad <i>Scaphiopus hammondi</i>	FSC/CSC	Floodplains and grassland pools	Moderate Potential	February- August

**TABLE III.E-3 (Continued)
SPECIAL-STATUS ANIMAL SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Period of Identification
<u>Reptiles</u>				
Western pond turtle <i>Clemmys marmorata</i>	FSC/CSC	Freshwater ponds and slow streams edged with sandy soils for laying eggs	High Potential	warm days
San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i>	FE/CE	Freshwater ponds and slow streams with emergent vegetation	High Potential	warm days
<u>Birds</u>				
Cooper's hawk <i>Accipiter cooperi</i>	--/CSC	Nests in riparian growths of deciduous trees and live in oaks	High Potential	March-July
Sharp-shinned hawk <i>Accipiter striatus</i>	--/CSC	Nests in riparian growths of deciduous trees and live oaks	High Potential	March-July
Great blue heron <i>Ardea herodias</i>	--/*	Nests in trees along lakes and estuaries	High Potential	Dec.-July
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT/CE	Nests in dense, old growth forests along coast	High Potential	Year-round
Northern harrier <i>Circus cyaneus</i>	--/CSC	Nests and forages in wet meadows and pastures	High Potential	Year-round
Merlin <i>Falco columbarius</i>	--/CSC	A winter visitor of woodlands, foothills and valleys	High Potential	Winter
● American peregrine falcon <i>Falco peregrinus anatum</i>	--/CE	Nests in cliffs and outcrops	Moderate Potential	Year-round
Bald eagle ^a <i>Haliaeetus leucocephalus</i>	FT/CE	Nests and forages on inland lakes, reservoirs, and rivers	High Potential	Winter
Osprey <i>Pandion haliaetus</i>	--/CSC	Nests near fresh water lakes and large streams on large snags	Moderate Potential	March-June
American white pelican <i>Pelecanus erythrorhynchos</i>	--/CSC	Nests on protected islets near freshwater lakes for protection from predators	Moderate Potential	May-July
<u>Mammals</u>				
Pallid bat <i>Antrozous pallidus</i>	--/CSC	Roosts in caves, old buildings and under bark. Forages in open lowland areas and forms large maternity colonies in spring.	High Potential	February-August
Western mastiff bat <i>Eumops perotis</i>	FSC/CSC	Open semi-arid to arid habitats roosting on high cliffs and buildings	High Potential	February-August
Small-footed myotis <i>Myotis ciliolabrum</i>	FSC/--	Roosts in caves, old buildings and under bark	High Potential	February-August

**TABLE III.E-3 (Continued)
SPECIAL-STATUS ANIMAL SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Period of Identification
<u>Mammals (cont.)</u>				
Long-eared myotis <i>Myotis evotis</i>	FSC/--	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring	High Potential	February-August
Fringed myotis <i>Myotis thysanodes</i>	FSC/--	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring	High Potential	February-August
Long-legged myotis <i>Myotis volans</i>	FSC/--	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring.	High Potential	February-August
Townsend's big-eared bat <i>Plecotus townsendii</i>	FSC/CSC	Roosts in caves, old buildings and under bark. Forages in open lowland areas and forms large maternity colonies in spring.	Moderate Potential	February-August
Badger <i>Taxidea taxus</i>	--/*	Open grasslands with loose, friable soils	Moderate Potential	Year-round
Mountain lion <i>Felis spp.</i>	--/4800	Rural grasslands and woodlands	High	Year-round
<u>Fish</u>				
Steelhead trout <i>Oncorhynchus mykiss</i>	FT/--	Freshwater streams	High Potential	Year-round

Federal Categories (USFWS)

FE = Listed as Endangered (in danger of extinction) by the Federal Government.
 FT = Listed as Threatened (likely to become endangered within the foreseeable future) by the Federal Government.
 FPE = Proposed for Listing as Endangered
 FPT = Proposed for Listing as Threatened
 FC = Candidate to become a *proposed* species.
 FSC = Federal Species of Concern. May be endangered or threatened, but not enough biological information has been gathered to support listing at this time.
 FC3c = Species removed from listing

State Categories (CDFG)

CE = Listed as Endangered by the State of California
 CT = Listed as Threatened by the State of California
 CR = Listed as Rare by the State of California (plants only)
 CSC = California Species of Special Concern
 * = Special Animals
 3511 = Fully protected bird species (Fish and Game Code)
 3503.5 = Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)
 4800 = Mountain lion protection

High Potential = Species expected to occur and meets all habitats as defined in list.
 Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
 Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.
 -- = No listing status.

^a Federal delisting is currently proposed, pending publication in the *Federal Register*.

SOURCE: Environmental Science Associates, 1994, 1998; CDFG, 1998

Mission blue butterfly (*Icaricia* [= *Plebejus*] *icarioides missionensis*). The Mission blue butterfly is a federally endangered species that is associated with coastal grasslands and coastal sage scrub habitats, where its larval foodplants, three perennial species of lupine (*Lupinus albifrons*, *L. variicolor*, and *L. formosus*), grow. The Mission blue butterfly is a federally endangered species that today is known primarily from San Mateo County, but also occurs at Twin Peaks in San Francisco and at the north end of the Golden Gate Bridge in Marin County (Arnold, 1983; 1978). It was formerly more widely distributed in San Francisco, and as its scientific name implies, was known to live in the Mission District. Murphy (1985) discovered a population of the Mission blue butterfly in the Watershed in the vicinity of San Andreas Dam, where the butterfly was observed in grassland habitat.

Callipe silverspot butterfly (*Speyeria callippe callippe*). The Callipe silverspot butterfly is a federally endangered species that occurs in coastal grasslands where its larval foodplant, *Viola pedunculata*, grows. Oberlander (1953) observed populations of its larval foodplant in the Watershed. Although this species was formerly distributed throughout the San Francisco Bay Area, today the butterfly is known only from San Bruno Mountain in San Mateo County, Joaquin Miller and Redwood Regional Parks in Oakland, and the hills of southern Solano County (Arnold, 1981). Adults are particularly fond of various thistle (*Cirsium*) and mint (*Monardella*) species for nectar.

Bay checkerspot butterfly (*Euphydryas editha bayensis*). The Bay checkerspot butterfly is a federally threatened species that occurs in serpentine bunchgrass grassland habitats, especially those characterized by bunchgrasses. Its larval foodplants are *Plantago erecta* and *Castilleja densiflora* (= *Orthocarpus*). Adults nectar on *Layia platyglossa*, two species of *Lomatium*, two species of *Allium*, and *Lasthenia californica*. Today the checkerspot is known only from a handful of localities in San Mateo and Santa Clara Counties, but it formerly also occurred in Alameda, Contra Costa, and Marin Counties (Ehrlich et al., 1975). One of the remaining Bay checkerspot butterfly populations occurs at Edgewood Park, which is adjacent to the southeastern portion of the Watershed. In recent years, adult checkerspots have been periodically observed in the serpentine “triangle” area (Arnold, 1998).

Myrtle silverspot butterfly (*Speyeria zerene myrtleae*). This species is federally endangered and occurs in coastal grasslands where its larval foodplant, *Viola pedunculata*, is found. Potential habitat is found within the native grasslands of the Watershed. Though there are no documented occurrences of this species in the Watershed, its potential to occur remains high because suitable habitat exists.

Steelhead (*Oncorhynchus mykiss*). Central California coast steelhead exhibit one of the most complex life histories of any salmonid species. The species may be anadromous, migrating between fresh and salt waters, or freshwater residents, which reside entirely in freshwater environments. Resident forms are referred to as “rainbow trout”, while anadromous forms are referred to as “steelhead.” This species migrates to marine waters after spending one or more years in freshwater. They typically reside in marine waters 2-3 years before returning to their natal stream to spawn as 4 or 5 year olds. California coastal steelhead were proposed for listing by the U.S. Fish and Wildlife Service in 1996, and the status of the central California population

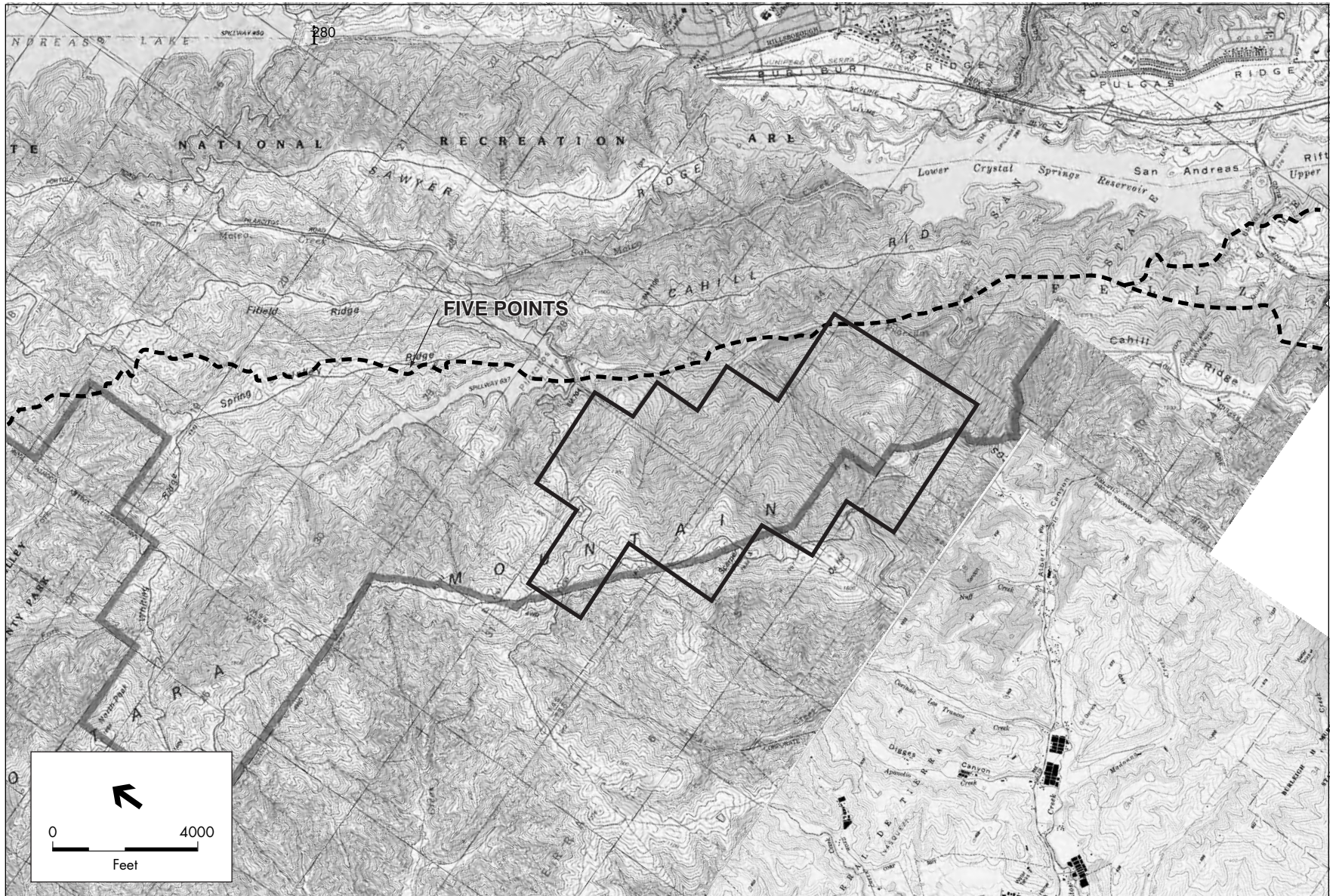
was lessened to threatened in 1997. Steelhead have been collected in the past within the Watershed (i.e., Pilarcitos Creek and lagoon, Apanolia, Arroyo Leon Creek, and Mills Creek). Fish that were either rainbow trout or steelhead were observed during a 1998 survey (Environmental Science Associates, 1998).

California red-legged frog (*Rana aurora draytonii*). The California red-legged frog is a federally threatened species that primarily inhabits ponds, but will also inhabit slow-moving streams or pools in intermittent streams (Stebbins, 1985; CDFG, 1988). The species' range extends from the western slope of the Cascade-Sierra mountain system to the North and South Coast Ranges and the Transverse Range. Habitat for the California red-legged frog is present within the Watershed, and the frog has been sighted in several locations in the Watershed.

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). San Francisco garter snake is a California and federal endangered species that feeds primarily on California red-legged frog, but will also prey upon Pacific tree-frogs (*Hyla regilla*), immature California newts (*Taricha torosa*), recently metamorphosed western toads (*Bufo boreas*), and fish (USFWS, 1985). The majority of the sightings have been in the vicinity of standing water, specifically permanent ponds, lakes, marshes, and sloughs, although temporary ponds and seasonal bodies of water are also used. Banks with emergent and wetland vegetation are used for cover. San Francisco garter snake was documented in the Upper Crystal Springs Reservoir and was observed at Mud Dam (CDFG, 1998; Environmental Science Associates, 1998). In 1997 and 1998, the snake was documented at San Andreas Reservoir and in a sag pond between San Andreas and Crystal Springs (McGinnis, 1998).

Marbled murrelet (*Brachyramphus marmoratus marmoratus*). The marbled murrelet, a small (robin-sized) seabird, is a California endangered and federal threatened species. Marbled murrelets feed at sea, but nest inland in mature conifer forests with open-crown canopies such as Douglas fir, western hemlock, Sitka spruce, coastal redwood, and mountain hemlock forests. The marbled murrelet forages at sea for fish and invertebrates within a mile of shore (USFWS, 1995). During the winter, this species forages outside the summer feeding grounds but still remains close to shore. Critical habitat in the Watershed was designated for the marbled murrelet in August, 1995. The approximately 947-acre critical habitat area is located southwest of Five Points (see Figure III.E-1). Critical habitat, as defined in the Endangered Species Act, is land which is "essential to the conservation of the species," and which "may require special management consideration or protection." The designation of critical habitat, a federal action, virtually guarantees that the land and its vegetation carry the same protection as the animals themselves. This species was positively detected on Watershed lands in 1998 (Environmental Science Associates, 1998).

Bald eagle (*Haliaeetus leucocephalus*). This species is federally threatened and state endangered, is protected under the Bald Eagle Protection Act, is classified as a California fully-protected species by the CDFG, and named as sensitive under the California Department of Forestry and Fire Protection regulations (see Table III.E-3). However, species is proposed for federal delisting, pending publication in the *Federal Register*. Protection under the Bald Eagle Protection Act would remain intact. The bald eagle uses most of California's lakes, river



SOURCE: Albion Environmental, 1998; Environmental Science Associates.

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Figure III.E-1
Marbled Murrelet Critical Habitat

systems, and coastal wetlands and forages near large bodies of water, such as reservoirs, lakes, or rivers that are either regulated or free-flowing. Snags or large, old-growth trees are required for perching. Wintering birds have been observed using San Andreas Reservoir (SFWD, 1994).

American peregrine falcon (*Falco peregrinus anatum*). This species is federally and state endangered and is classified as fully protected by CDFG and as sensitive under the California Department of Forestry and Fire Protection regulations (Section 895.1). However, this species is proposed for federal delisting, pending publication in the *Federal Register*. This transient bird breeds and feeds near bodies of water in open areas with cliffs and canyons. It formerly occurred worldwide in a variety of habitats (i.e., woodland, forest, and coastal habitats). Today only 147 breeding pairs exist throughout California (USFWS, 1998). The entire Watershed is located within the breeding range of this species.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for biological resources impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant effect on biological resources if it were to:

- have a substantial adverse effect on any species identified as threatened, endangered, candidate, or sensitive (rare), as discussed in CEQA Guidelines Section 15380;
- have a substantial adverse effect on the habitat of endangered, threatened, or rare species, or other sensitive natural community identified in local or regional plans, policies, regulations, or on lists compiled by CDFG or USFWS;
- have a substantial adverse effect on federally protected wetlands (including, but not limited to, marshes and riparian areas) as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of CDFG, as defined by Fish and Game Codes 1601-1603; or
- substantially interfere with movement of any native resident or migratory fish or wildlife species, or with established fish or wildlife migratory or dispersal corridors.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of *Peninsula Watershed Management Plan* actions on vegetation and wildlife of the Watershed, including the following types of actions:

- Removal of non-native forests;
- Watershed operations, maintenance, and construction activities; and
- Increase in public access and use.

Removal of Non-native Forests

Non-native forests include Monterey cypress, Monterey pine, and eucalyptus and occur in several areas of the Watershed. Monterey cypress and Monterey pine forests occur on the east-facing slopes above Upper Crystal Springs Reservoir and the west-facing slopes above Lower Crystal Springs Reservoir. Eucalyptus forest occurs on the east side of San Andreas Lake and at the southern intersection of Cañada Road and I-280. These forests provide potential roosting and nesting sites for various raptors and other birds that are protected by CDFG Codes 3503 and 3503.5 and the Migratory Bird Treaty Act (see Section 1.1, Special-Status Species Definition). For example, raptors such as red-tailed hawks (*Buteo jamaicensis*) may use the large Monterey cypress and Monterey pine trees during the breeding season (mid-February to early-July).

Action veg7 requires the removal of non-native forests, such as eucalyptus, Monterey pine, and Monterey cypress. Tree removal during the roosting and breeding seasons of various raptors would violate CDFG codes as cited above. Removal activities, such as tree harvesting, could also alter nesting behavior, jeopardize eggs and young, and reduce parental attentiveness. Over time, there may be a decline in species number and fecundity (fertility) rates and an increase in local extinction rates of these species. This could have a substantial adverse effect on protected species and could thus be considered a significant impact.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Table III.E-4 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented. Not every bolded action would be necessary to mitigate the effects of the associated potential impact-causing management action. Because implementation information, such as location and extent of activities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

The most important means of reducing potential impacts related to the removal of non-native forests is the implementation of **Action veg7.1**. This action requires the identification of stands of exotic trees that serve as important roosting and nesting sites for various raptors and other birds protected by CDFG Code 3503. The action includes direction to work with appropriate agencies to preserve core habitat. In addition, **Action will** requires avoidance of nest disturbance during construction, that the removal of nests occur during the nonbreeding period, and that the nests discovered during construction surveys be tagged and avoided until the nests are abandoned or

**TABLE III.E-4
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
NATURAL RESOURCES FROM THE REMOVAL OF NON-NATIVE FORESTS**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action veg7 : Identify and remove non-native forests, such as eucalyptus, Monterey pine, and Monterey cypress	Actions veg7.1 , will1 , and veg5.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

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the young have fledged. Habitat preservation and restoration are also supported by veg5, which calls for the development of a native species planting program for disturbed areas.

Implementation of these actions, as described above and in Section IV.E, would reduce the potential impacts associated with removal of non-native forests to less a than significant level.

Watershed Operations, Maintenance, and Construction Activities

Implementation of the Management Plan would result in a number of additional facilities or improvements on the Watershed, thereby generating potential construction impacts. Many of these projects would be undertaken to ensure and/or improve water quality or resource protection on the Watershed, such as placement of barriers or fences along reservoir edges, dams, and identified high-risk spill potential areas (Actions haz4 and haz8); cleanup and enhancement of the Skyline Quarry (Action haz7); placement of barriers on Upper Crystal Springs Dam (Action haz9); installation of infiltration drainfields and detention basins (Action sto1); installation of long-term sediment retention basins or other permanent measures (Action aqu12); rehabilitation of shoreline areas and stream segments (Actions aqu5 and aqu7); improvements that prevent human and animal waste from impacting Watershed resources (Actions was1 and was5); vegetation clearing around power lines, transformers, and pole structures (Action veg14); elimination of unnecessary infrastructures (Action wil4); and installation of wildlife passage structures (Action wil14). Many of the actions listed in the Roads Section of the Management Plan (Actions roa2, roa3, roa4, roa6, roa7, and roa8) would modify or relocate existing roads or road components in order to reduce potential erosion and Watershed contamination from automobile by-products. Fire management actions include the installation of hydrants, helispots, and water tanks (Actions fir2 through fir5); roadway and access improvements (Actions fir6 and fir7); and implementation of fuel management projects that include constructing fuel breaks, conducting prescribed burns, and other improvements (Action fir8). Actions con4 and wil7 call for use of vegetation treatments or prescribed fire to reduce brush and enhance habitat. Construction projects would be generated through actions that would provide additional public use opportunities, such as information kiosks and a Watershed Visitor Education Center (Actions pub3 and pub4), the southern extension of the Fifield/Cahill Ridge Trail (Action tra2), and new trails (Policies WA15.2 and WA15.4). In addition, implementation of Action des8 would result in universal access improvements at SFPUC facilities and trails.

Construction of the facilities and improvements described above would cause direct disturbance to native plant communities, such as Douglas fir forest, and would indirectly disturb special-status species that use the communities for food and cover. Construction activities, such as those required to implement some of the Watershed management actions in the Management Plan, could increase the density and distribution of invasive plant species, if vegetation were removed or repeatedly trampled. These activities could create suitable conditions for germination of buried seeds of invasive plant species by exposing the soil surface to sunlight and moving the seeds from lower depths to locations on or near the soil surface. Construction activities could also serve as dispersal vectors for seeds of invasive plant species, which could latch onto construction equipment and the shoes of workers.

Although the aim of Actions wil4 and wil7 is to improve terrestrial habitat over the long term, implementation of this and other management activities could directly disturb native plant communities by trampling, removing, or repeated disruption of vegetation. Such activity would modify the structure, composition, and diversity of the plant communities and thereby have a substantial effect on these species. Modification of native plant communities could lead to a decline in associated wildlife species, and ultimately result in a decline in the local populations of special-status wildlife species such as sharp-shinned hawks, which feed on wildlife species that inhabit native plant communities. In addition, construction could inadvertently disturb trees (either through damage or removal) that provide potential roosting and nesting sites for various raptors and other birds that are protected by CDFG Codes 3503 and 3503.5 and the Migratory Bird Treaty Act (see Section 1.1, Special-Status Species Definition). Thus, construction activities could be a significant impact to Watershed natural resources.

Table III.E-5 links those actions that could result in impacts with the full range of actions that could be required to reduce the potential impacts. The most important means of reducing potential impacts associated with Watershed management activities is the development and implementation of a Vegetation Management Plan (Action **veg1**). In addition, **Action 7.1** requires identification of stands of exotic trees that could serve as important roosting sites for various raptors and other birds protected by CDFG Code 3503. Action **will** requires avoidance of nest disturbance during construction, that the removal of nests occur during the nonbreeding period, and that the nests discovered during construction surveys be tagged and avoided until the nests are abandoned or the young have fledged. The Management Plan also includes provisions for pre-activities database searches and surveys (Actions **veg2** and **veg3**).

Implementation of these management actions, as described above and in Section IV.E, would reduce the potential impacts to natural resources from operations, maintenance, and construction activities to a less than significant level. The impacts of day-to-day management activities that implement the Management Plan are analyzed in this EIR and generally would not be subject to further environmental review. No unavoidable significant program-level natural resources impacts related to Watershed operations, maintenance, and construction activities have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Increase in Public Access and Use

The *Peninsula Watershed Management Plan* includes facilities that could result in increased public visitation of the Watershed by providing new trails (Policies WA15.2 and WA15.4, and Action **tra2** [the southern trail extension of the Fifield/Cahill Ridge Trail]), increased information (such as maps and brochures) regarding public activities available on the Watershed, or additional public activity destinations. These facilities include information kiosks (Action **pub3**) and a Watershed Visitor Education Center (Action **pub4**). In addition, provision of universal access at Watershed facilities could increase public use of the Watershed (Action **des8**).

**TABLE III.E-5
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
NATURAL RESOURCES FROM CONSTRUCTION ACTIVITIES**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action haz4: Identify key locations for, and install, barriers or fencing to prevent access to reservoir edges and dams.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action haz7: Develop and implement a cleanup and enhancement plan for Skyline Quarry, including slope stabilization.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action haz8: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action haz9: Install barriers on Upper Crystal Springs Dam.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, or detention basins.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection measures.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action aqu7: Rehabilitate stream segments.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action was1: Repair/replace vault, chemical, and composting toilets as necessary.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action was5: Install restrooms on Army Road.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action roa2: Relocate necessary high-use roads/road segments in proximity to streams.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action roa3: Modify the grading and drainage of necessary high-use roads/road segments.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.E-5 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
NATURAL RESOURCES FROM CONSTRUCTION ACTIVITIES

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
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 veg1, veg7.1, will , veg2, and veg3.	LTS
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action roa8: Restrict access on low-use roads by gates or barriers.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action fir2: Install a total of seven hydrants into water sources.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action fir3: Install and maintain a total of five helispots.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action fir4: Install two additional hydrants on adjacent lands.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action fir5: Install two additional water tanks.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action fir6: Undertake road improvements to improve access for fire suppression.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action con4: Reduce brush through use of prescribed fire.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS
Action wil7: Create palatable re-sprouting through mechanical treatments or prescribed fire.	Actions veg1, veg7.1, will , veg2, and veg3.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

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PS = Potentially Significant

LTS = Less than Significant

TABLE III.E-5 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
NATURAL RESOURCES FROM CONSTRUCTION ACTIVITIES

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action veg14: Coordinate with PG&E to clear vegetation around powerlines, transformers, and pole structures.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Action wil4: Relocate or eliminate unnecessary infrastructure and facilities.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Action wil14: Design and install wildlife passage structures that minimize wildlife losses.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Action pub3: Establish “gateway” information kiosks.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Action pub4: Establish a Visitor Education Center.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities, trails, or other agencies, and complete a north-south public trail along the eastern edge of the Watershed.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions veg1 , veg7.1 , will , veg2, and veg3.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

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With increased activity associated with public use of the Watershed, invasive species would likely be transported by visitors onto Watershed land at a greater rate than occurs at present. Seeds of invasive species are likely to be dispersed (cattered) by such vectors as the boots of hikers, the hooves and dung of horses, and the tires of bicycles. Invasive plant species may cause:

- a decline in distribution and density of native wildlife habitat, especially of special-status butterfly species limited to a single food source (e.g., the larvae of the Bay checkerspot butterfly is limited to *Plantago erecta*);
- a decrease in native plant diversity, including special-status plant species such as coast rock cress (*Arabis blepharophylla*) and San Francisco wallflower (*Erysimum franciscanum*); and
- a direct modification of the environment, such as transformation from a sensitive plant community of valley needlegrass grassland to a non-native annual grassland.

The establishment of a viable population of invasive, non-native species in ecologically sensitive areas may also lead to alterations in the community composition, diversity, and richness of wildlife and plants (Falk, 1992). The potential for increased density and distribution of invasive species is proportionate to the increase in the number of visitors to the Watershed and would constitute a significant impact.

Potentially significant loss of vegetation and wildlife due to human disturbances (recreational activities) may be caused by: (1) excessive noise, trampling, or rapid movements by joggers and bicyclists resulting in harassment to wildlife; (2) increased garbage, road-kills, and trash that attract corvids, resulting in nest predation; (3) loss of species diversity; and (4) off-trail activity resulting in habitat destruction and/or fragmentation and spread of invasive species. The experience of other open space managers has shown that more serious degradation occurs on property where bicycles are allowed (MMWD, 1997). These effects could have substantial impacts on species and wildlife and are discussed in more detail in Section V.E.

Section III.G (Fire Management) discusses the potential for increased fire hazard resulting from new recreational activities. A catastrophic fire caused by increased visitor use would adversely affect plant and wildlife species and reduce the diversity of wildlife, since most plant and wildlife species in the Watershed are not adapted to frequent fires (e.g., western leatherwood and California bottle-brush grass). The marbled murrelet, which is typically found in the large-diameter, old-growth trees located within its critical habitat (see Figure III.E-1) is especially sensitive to fire. Mistletoe blooms, presence of moss, and dead material in trees are important indicators of suitable nesting habitat for marbled murrelets and provide ideal “ladder fuels” for carrying fire into the forest canopy.

Table III.E-6 links those actions that could result in impacts with the full range of actions that could be required to reduce the potential impacts. The most important means of reducing potential impacts related to invasive plant species is implementation of Action **veg6**, which calls for invasive plant species control and eradication activities. However, increased public use would increase the time it takes to control and eradicate invasive species and would make the effort increasingly difficult and expensive, as recreation activities that spread invasive species occur at the same time as eradication efforts.

**TABLE III.E-6
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO NATURAL RESOURCES FROM
AN INCREASE IN PUBLIC ACCESS AND USE**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action pub3: Establish information kiosks at Watershed entryways.	Actions veg6 , saf1, saf2, saf4 , saf6 , saf10, saf16 , saf17, pub8 , pub9 , and pub12.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions veg6 , saf1, saf2, saf4 , saf6 , saf10, saf16 , saf17, pub8 , pub9 , and pub12.	LTS
Policy WA15.2: Consider additional new trails in zones of lesser vulnerability and risk.	Actions veg6 , saf1, saf2, saf4 , saf6 , saf10, saf16 , saf17, pub8 , pub9 , and pub12.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities, trails, or other agencies, and complete a north-south public trail along the eastern edge of the Watershed.	Actions veg6 , saf1, saf2, saf4 , saf6 , saf10, saf16 , saf17, pub8 , pub9 , and pub12.	LTS
Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.	Actions veg6 , saf1, saf2, saf4 , saf6 , saf10, saf16 , saf17, pub8 , pub9 , and pub12.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions veg6 , saf1, saf2, saf4 , saf6 , saf10, saf16 , saf17, pub8 , pub9 , and pub12.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

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The most important means of reducing potential impacts associated with loss of vegetation and wildlife due to human disturbances are to advocate responsible use of the Watershed and enforce the rules and regulations established for such use. Actions **pub8** and **pub9** would increase public education and awareness of Watershed resources sensitivity and would publish rules and regulations for Watershed visitors. This information would be provided in all areas subject to public use, including the kiosks, the Watershed Visitor and Education Center, and the mobile exhibit. Actions **saf4** and **saf6** require an inspection and maintenance program for facilities used by the public, and inspection of perimeter fencing, access gates, and locks in order to minimize trespassing and illegal dumping. In addition, Action **saf16** would establish coordinated enforcement of public use of the Watershed with the Golden Gate National Recreation Area and San Mateo County agencies.

The Management Plan also includes actions that, when implemented with actions described above, would further reduce the potential aesthetic quality impact associated with litter, disturbed vegetation, and damaged facilities. Actions saf1, saf2, saf10, and saf17 provide additional means for monitoring public use of the Watershed and enforcing Watershed rules and regulations. Action pub12 requires coordination with other agencies and groups in the development of educational materials, further providing the opportunity for dissemination of information advocating responsible use of the Watershed.

Implementation of design guidelines and seasonal restrictions on recreational activities would reduce the potential impacts on wildlife from increased public access and use. In addition, actions described in Section III.I, Aesthetics, under the heading Increase in Public Access and Use, would reduce the potential impacts related to wildlife disturbance. Implementation of these actions, as described above and in Section IV.E, would reduce potential natural resources impacts associated with increased public access and use to a less than significant level. Implementation of reducing actions described in Section III.G, Fire Management, would reduce potential fire risks associated with increased public use to a less than significant level. No unavoidable significant program-level natural resources impacts related to increased public access and use have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

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F. AIR QUALITY

1.0 SETTING

1.1 CLIMATE AND METEOROLOGY

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted. Meteorological and topographical conditions are also important factors. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The Peninsula Watershed is located within San Mateo County, the Bay Area Air Quality Management District's (BAAQMD's) Peninsula subregion.

San Mateo County is located along the western edge of the San Francisco Bay Area Air Basin. The prevailing wind in San Mateo County is a light to moderate wind from the northwest, although wind patterns in this area are influenced greatly by local topographic features. Annual average wind speeds range from 5 to 10 miles per hour through the Peninsula, with higher wind speeds usually along the coast. Winds along the eastern side of the Peninsula are often high in certain areas, such as the San Bruno Gap and the Crystal Springs Gap. This wind intensifies in the afternoon during the spring and summer as inland temperatures increase. The County experiences average maximum temperatures in the range of 64 and 80 degrees Fahrenheit, with the cooler temperatures along coastal areas and the northern parts of the County. The average mean minimum temperature in the County is between 40 and 42 degrees Fahrenheit.

1.2 AIR QUALITY PLANS, POLICIES, AND STANDARDS

Regulation of air pollution is achieved through both national and state ambient air quality standards and emission limits for individual sources of air pollutants, as described below.

Federal

The 1977 federal Clean Air Act (CAA) required the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards, or national standards, to protect public health and welfare. National standards have been established for six criteria air pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM-10), and lead. These pollutants are called "criteria" air pollutants because standards have been established to meet specific public health and welfare criteria set forth in the CAA. Table III.F-1 lists the national standards established for the six criteria air pollutants.

Under the CAA, air quality plans (known as State Implementation Plans, or SIPs) were required to be prepared for areas classified as "nonattainment" for any of the national standards. These plans were to contain a strategy for improving air quality and achieving the national standards.

Pursuant to the 1990 federal Clean Air Act Amendments, the EPA reclassified air basins (or portions thereof) as either "attainment" or "nonattainment" for each criteria air pollutant, based

**TABLE III.F-1
STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	State of California^{a,b}	National^{b,c}
Ozone ^d	1 hour	0.09 ppm (180 µg/m ³)	0.12 ppm (235 µg/m ³)
	8 hour	NA	0.08 ppm (160 µg/m ³)
Carbon Monoxide	1 hour	20 ppm (23,000 µg/m ³)	35 ppm (40,000 µg/m ³)
	8 hour	9.0 ppm (10,000 µg/m ³)	9 ppm (10,000 µg/m ³)
Nitrogen Dioxide	1 hour	0.25 ppm (470 µg/m ³)	NA
	Annual	NA	0.053 ppm (100 µg/m ³)
Sulfur Dioxide	1 hour	0.25 ppm (655 µg/m ³)	NA
	3 hour	NA	0.5 ppm (1,300 µg/m ³)
	24 hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)
	Annual	NA	0.03 ppm (80 µg/m ³)
Particulate Matter (PM-10)	24 hour	50 µg/m ³	150 µg/ m ³
	Annual	30 µg/m ³	50 µg/ m ³
Particulate Matter (PM-2.5) ^d	24 hour	NA	65 µg/ m ³
	Annual	NA	15 µg/ m ³
Sulfates	24 hour	25 µg/m ³	NA
Lead	30 day	1.5 µg/m ³	NA
	Calendar Quarter	NA	1.5 µg/m ³
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m ³)	NA
Vinyl Chloride	24 hour	0.010 ppm (26 µg/m ³)	NA

^a California standards for ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, particulate matter (PM-10) are values that are not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

^b ppm = parts per million by volume; µg/m³ = micrograms per cubic meter.

^c National standards, other than for ozone and particulate matter and those based on annual averages, are not to be exceeded more than once per year. For the 1-hour ozone standard, the ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one. The 8-hour ozone standard is met at a monitoring site when the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.08 ppm.

^d New standards effective September 16, 1997 (40 CFR 50.7 and 40 CFR 50.10).

NA: Not Applicable.

SOURCE: CARB, 1998.

on whether or not the national standards had been achieved. The attainment status of each of the criteria air pollutants is discussed below.

Based on monitoring data in the 1970s, the Bay Area was designated “nonattainment” with respect to the national standards for ozone and carbon monoxide, and a SIP for the Bay Area was prepared. This 1982 SIP was intended to bring the Bay Area into compliance with the national standards by 1987. Under the federal Clean Air Act Amendments of 1990, SIPs were required to be revised to meet new requirements for those areas, like the Bay Area, that did not meet the 1987 deadline.

With respect to ozone, a SIP revision for the Bay Area was prepared pursuant to the federal Clean Air Act Amendments. This ozone SIP, the *Ozone Maintenance Plan*, was developed for the Bay Area in anticipation of a change in designation to “attainment.” In 1995, the EPA approved the BAAQMD’s request to change the Bay Area’s designation to “attainment” for the national standard for ozone based on monitoring data which indicated that the Bay Area had achieved the national standard. At the same time, the EPA also approved the *Ozone Maintenance Plan*, which then became part of the current ozone SIP for the Bay Area. However, the EPA recently announced its final decision to reclassify the entire Bay Area as “nonattainment” for ozone based on monitored violations in 1995 and 1996. As a result of that decision, a revised SIP will be required.

With respect to carbon monoxide, the EPA recently announced its decision to approve a redesignation request for the Bay Area to “attainment” for the national carbon monoxide standard and to approve a *Carbon Monoxide Maintenance Plan*, which is the new carbon monoxide SIP for the Bay Area.

The Bay Area is designated as “attainment” or “unclassified” with respect to the other criteria pollutants (CARB, 1998). “Unclassified” is defined by the Clean Air Act Amendments as any area that cannot be classified, on the basis of available information, as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

State

California has adopted ambient standards, the State Ambient Air Quality Standards, that are more stringent than the federal standards for the criteria air pollutants (see Table III.F-1). In 1988, the state legislature passed the California Clean Air Act (CCAA), which is patterned after the federal Clean Air Act to the extent that areas are required to be designated as “attainment” or “nonattainment,” for the state standards rather than the national standards. The Bay Area is a “nonattainment” area for ozone and respirable particulate matter with respect to their respective state standards (CARB, 1998). The Bay Area is designated as an “attainment” area for carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead, and “unclassified” with respect to hydrogen sulfide.

Under the CCAA, areas designated as “nonattainment” for the state standards were required to develop air quality plans in addition to those required under federal laws. In 1991, an air quality

plan, *Bay Area '91 Clean Air Plan'*, was developed to address the Bay Area's (then) designation of "nonattainment" for the state ozone and carbon monoxide standards.¹ The goal of the *'91 Clean Air Plan* was to improve air quality in the 1990s through tighter industry controls, cleaner cars and trucks, cleaner fuels, and increased commuter alternatives. The *'91 Clean Air Plan* has been updated on a triennial basis. The most recent update is the *'97 Clean Air Plan*, which contains additional control strategies (BAAQMD, 1997a).

1.3 REGULATORY AGENCIES

The California Air Resources Board (CARB), the state's air quality management agency, regulates mobile emissions sources such as construction equipment, trucks, and automobiles, and oversees the activities of regional/county air districts. CARB is responsible for establishing emissions standards for on-road motor vehicles sold in California. BAAQMD is the regional agency empowered to regulate air pollutant emissions from stationary sources in the Bay Area. BAAQMD regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review activities. BAAQMD's permit authority does not extend to mobile emissions sources.

1.4 EXISTING AIR QUALITY CONDITIONS

The BAAQMD operates a regional air quality monitoring network that provides information on ambient concentrations of criteria air pollutants. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors. Table III.F-2 presents a five-year summary of the criteria air pollutant concentrations collected at the BAAQMD's Redwood City Air Monitoring Station. This station is located approximately five miles east of the closest Watershed boundary. Table III.F-2 compares air pollutant concentrations with the corresponding state standards, which are more stringent than their national counterparts. The following discussion focuses on air quality trends with respect to ozone and PM-10, the "nonattainment" pollutants in the Bay Area.

Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases and nitrogen oxides. Reactive organic gases and nitrogen oxides are known as ozone "precursors." Significant ozone production generally requires ozone precursor presence for approximately three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production. Ozone concentrations tend to be higher in the late spring, summer, and fall, when a combination of long sunny days and regional subsidence inversions create conditions conducive to the formation and accumulation of secondary photochemical compounds.²

¹ Subsequent to the issuance of the *'91 Clean Air Plan*, the Bay Area did achieve attainment status for carbon monoxide.

² A subsidence inversion is a layer of warmer air over a layer of cooler air. Subsidence inversions occur at the point where low and high pressure air meets. Subsidence inversions affect air quality in that they affect the mixing depth. The highest air pollutant concentrations in the Bay Area generally occur during subsidence inversions.

**TABLE III.F-2
REDWOOD CITY AIR POLLUTANT SUMMARY (1993-1997)**

Pollutant	State Standard ^a	Monitoring Data by Year ^b				
		1993	1994	1995	1996	1997
<u>Ozone:</u>						
Highest 1-hr. average, ppm ^c	0.09	0.10	0.08	0.14	0.10	0.09
Number of exceedences ^d	1	0	5	1	0	
<u>Carbon Monoxide:</u>						
Highest 1-hr. average, ppm	20	10	12	10	9	ND
Number of exceedences		0	0	0	0	
Highest 8-hr. average, ppm	9.0	4.8	5.5	4.0	3.5	4.2
Number of exceedences		0	0	0	0	0
<u>Nitrogen Dioxide:</u>						
Highest 1-hr. average, ppm	0.25	0.09	0.11	0.08	0.09	0.08
Number of exceedences		0	0	0	0	0
<u>Sulfur Dioxide:</u>						
Highest 1-hr. average, ppm	0.25	ND	ND	ND	ND	ND
Number of exceedences						
<u>Particulate Matter (PM-10):</u>						
Highest 24-hr. average, µg/m ^{3c}	50	76	76	48	48	70
Exceedences/Samples ^e		5/61	6/61	0/61	0/61	2/61
Annual Geometric Mean, µg/m ³	30	22.9	21.9	18.7	19.2	22.3
<u>Lead (Pb):</u>						
Highest monthly average, µg/m ^{3c}	1.5	0.03	0.02	ND	ND	ND
Number of Exceedences ^e		0	0			

^a State standard, not to be exceeded.

^b Data for all pollutants are from the air quality monitoring station in Redwood City, which is located approximately five miles east of the *Peninsula Watershed Management Plan* area.

^c ppm = parts per million; µg/m³ = micrograms per cubic meter.

^d Except for ozone, “number of exceedences” refers to the number of measured violations in a given year of the applicable standard. For ozone, “number of exceedences” refers to the number of days in a given year during which at least one hour exceeded the standard.

^e PM-10 and Pb is usually measured every sixth day (rather than continuously like the other pollutants). For PM-10, “exceedences/samples” indicates the number of exceedences of the state standard that occurred in a given year and the total number of samples that were taken that year.

NOTE: ND = No data available. Values shown in **bold** type exceed the applicable standard.

SOURCE: CARB, 1993-1996; BAAQMD, 1997b.

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways (BAAQMD, 1996). Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. The data contained in Table III.F-2 show that the maximum hourly ozone concentration violated the state ozone standard in three of the past five years in which data were collected.

PM-10 consists of particulates 10 microns (a micron is one one-millionth of a meter) or less in diameter, which can be inhaled and cause adverse health effects. Particulates in the atmosphere result from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of the operations, such as demolition and construction activities, primarily contribute to increases in local PM-10 concentrations, while others, such as vehicular traffic, affect regional PM-10 concentrations. A subcomponent of PM-10, particulates 2.5 microns or less in diameter (PM-2.5), are the subject of recent regulatory action by the EPA. Table III.F-2 shows that the state 24-hour average PM-10 standard has been exceeded in three of the past five years.

Sources of air pollutants in the Peninsula Watershed area consist primarily of mobile sources, automobiles in particular. No significant sources of odors or toxic air contaminants currently exist or are planned in the project vicinity.

1.5 SENSITIVE RECEPTORS

Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because infants, the elderly, and people with health afflictions (especially respiratory ailments) are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present.

Land uses adjacent to the Watershed include predominantly residential land uses to the north, northwest, south, and east, and undeveloped land to the west. The lands abutting the SFPUC property are primarily low- and medium-density residential uses with individual property owners. A few of these residential parcels are within the drainage area of the Watershed. Filoli Estates is owned by a nonprofit organization, which operates and maintains the buildings, gardens, and orchards.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for air quality impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant effect on air quality if it were to:

- violate any ambient air quality standards;

- contribute substantially to existing or projected air quality violations;
- expose sensitive receptors to substantial pollutant concentrations; or
- permeate its vicinity with objectionable odors.

The BAAQMD has established thresholds for assessment of project impacts on air quality that are commonly employed in determining the significance of air quality impacts under CEQA. Construction emissions are typically considered less than significant if appropriate mitigation is provided to minimize particulate emissions. For operational impacts, emissions of 80 pounds per day of reactive organic gases, nitrogen oxides, and inhalable particulates are considered significant. Carbon monoxide emissions are considered in the context of roadside concentrations, measured against the state standard, since carbon monoxide is a local pollutant that does not readily disperse. Sensitive receptors (facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollution) are evaluated by their proximity to potential sources of air pollution. The closer the receptor is to an emission source, the more likely it is that a significant air quality impact could occur.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of *Peninsula Watershed Management Plan* actions on the air quality of the Watershed, including the following types of impacts:

- Construction-related emissions; and
- Fuel management.

Operational air pollutant emissions are not discussed because operation of Management Plan components would not significantly change trip distribution patterns in the project area, would not significantly increase vehicular traffic, and would not affect regional PM-10 concentrations. Emissions from facility operations would be negligible. Therefore, no discernible change in air quality from operational emissions is anticipated.

Construction-Related Emissions

Implementation of the Management Plan would result in a number of additional facilities or improvements on the Watershed, thereby generating construction projects. Many of the projects would be undertaken to ensure and/or improve water quality or resource protection on the Watershed, such as installation of barriers or fences along reservoir edges, dams, and identified high-risk spill potential areas (Actions haz4 and haz8); cleanup and enhancement of the Skyline Quarry (Action haz7); installation of barriers on Upper Crystal Springs Dam (Action haz9); installation of infiltration drainfields and detention basins (Action sto1); installation of long-term sediment retention basins or other permanent measures (Action aqu12); rehabilitation of shoreline areas and stream segments (Actions aqu5 and aqu7); improvements that prevent human and animal waste from impacting Watershed resources (Actions was1 and was5); and installation of wildlife passage structures (Action wil14). Many of the actions listed in the Roads Section of the Management Plan (Actions roa2, roa3, roa4, roa6, roa7, and roa8) would modify or relocate existing roads or road components in order to reduce potential erosion and Watershed

contamination from automobile by-products. Fire management actions include the installation of hydrants, helispots, and water tanks (Actions fir2 through fir5); roadway and access improvements (Actions fir6 and fir7); and implementation of fuel management projects that include constructing fuel breaks and other improvements (Action fir8). Construction projects would be generated through actions that would provide additional public use opportunities, such as information kiosks and a Watershed Visitor Education Center (Actions pub3 and pub4), the southern extension of the Fifield/Cahill Ridge Trail (Action tra2), and new trails (Policies WA15.2 and WA15.4). In addition, implementation of Action des8 would result in universal access improvements at SFPUC facilities and trails.

Construction projects would generate fugitive dust (including PM-10) and other criteria pollutants primarily through excavation activities, construction equipment exhaust and haul truck trips, and exhaust from construction-worker commute trips.³ Specific construction details related to these projects are unknown at this time, but specific project proposals could be presented during the 20-year planning period of the Management Plan. Dust emissions would vary from day to day, depending on the level and type of construction activity, the silt content of the soil, and the prevailing weather. A large portion of the total construction dust emissions would result from equipment and motor-vehicle traffic over paved and unpaved roads and temporary parking lots at project sites. Other sources of fugitive dust during construction would include excavation, earth movement, grading, and wind erosion from exposed surfaces.

Peak construction activities would involve minimal grading and earthmoving activities. The BAAQMD approach to assessing impacts from air pollutant emissions during construction activities is based upon whether identified feasible dust emission-control measures are implemented. Without implementation of construction-related dust emission-control measures, PM-10 emissions would adversely affect air quality and could cause violations of ambient air quality standards for PM-10 (see Table III.F-1). Therefore, construction-related dust emission is a potentially significant impact.

Construction equipment, on-road heavy-duty trucks, and construction-worker commute vehicles would also generate criteria air pollutant emissions. Emissions from construction-worker commute trips would be minor compared to the emissions generated by construction equipment. Criteria pollutant emissions of reactive organic gases and nitrogen oxides from these emissions sources would incrementally add to regional atmospheric loading of ozone precursors during project construction.

The *BAAQMD CEQA Guidelines* recognize that construction equipment emits ozone precursors, but indicate that such emissions are included in the emission inventory that is the basis for regional air quality plans, and that construction emissions are not expected to impede attainment or maintenance of ozone standards in the Bay Area (BAAQMD, 1996). Therefore, construction equipment emissions would not be a significant impact.

³ "Fugitive" emissions generally refer to those emissions that are released to the atmosphere by some means other than through a stack or tailpipe.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Table III.F-3 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented. Not every bolded action would be necessary to mitigate the effects of the associated potential impact-causing management action. For example, a very minor structure such as a kiosk located in an environmentally non-sensitive area may not require any of the bolded actions to avoid a significant effect. Because implementation information, such as locations of specific facilities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

The most important means of reducing potential air quality impacts associated with Watershed construction activities is implementation of dust-control best management practices. Action **des9** would require that a dust abatement program, incorporating BAAQMD-recommended BMPs, be implemented as part of all construction projects. This would require measures such as watering active construction areas, revegetating disturbed areas following construction, and covering stockpiles and trucks hauling soil or other loose materials. In addition, Action **roa12** includes BMPs for roadway and trail construction, including minimization of grading and road and trail design that avoids large cut-and-fill road design and minimizes excavation. Implementation of Action **des9** alone, as required in Section IV.F, would reduce potential fugitive dust impacts during project construction to a less than significant level (BAAQMD, 1996).

The impacts of day-to-day management activities that implement the Management Plan are analyzed in this EIR and generally would not be subject to further environmental review. No unavoidable significant program-level air quality impacts related to construction activities have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Fuel Control

Prescribed burning causes smoke production. However, implementation of prescribed burning under Policy F11, Fuel Management Projects, and Actions **con4** and **wil7**, requires development and approval of a prescription burn plan that would include measures to control smoke

**TABLE III.F-3
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
AIR QUALITY THROUGH CONSTRUCTION ACTIVITIES**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action haz4: Identify key locations for, and install, barriers or fencing to prevent access to reservoir edges and dams.	Action des9 .	LTS
Action haz7: Develop and implement a cleanup and enhancement plan for Skyline Quarry, including slope stabilization.	Action des9 .	LTS
Action haz8: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Action des9 .	LTS
Action haz9: Install barriers on Upper Crystal Springs Dam.	Action des9 .	LTS
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, or detention basins.	Action des9 .	LTS
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Action des9 .	LTS
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection measures.	Action des9 .	LTS
Action aqu7: Rehabilitate stream segments.	Action des9 .	LTS
Action was1: Repair/replace vault, chemical, and composting toilets as necessary.	Action des9 .	LTS
Action was5: Install restrooms on Army Road.	Action des9 .	LTS
Action roa2: Relocate necessary high-use roads/road segments in proximity to streams.	Actions roa12 and des9 .	LTS
Action roa3: Modify the grading and drainage of necessary high-use roads/road segments.	Actions roa12 and des9 .	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.F-3 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO AIR QUALITY THROUGH CONSTRUCTION ACTIVITIES

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
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 des9 .	LTS
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.	Actions roa12 and des9 .	LTS
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions roa12 and des9 .	LTS
Action roa8: Restrict access on low-use roads by gates or barriers.	Actions roa12 and des9 .	LTS
Action fir2: Install a total of seven hydrants into water sources.	Action des9 .	LTS
Action fir3: Install and maintain a total of five helispots.	Action des9 .	LTS
Action fir4: Install two additional hydrants on adjacent lands.	Action des9 .	LTS
Action fir5: Install two additional water tanks.	Action des9 .	LTS
Action fir6: Undertake road improvements to improve access for fire suppression.	Action des9 .	LTS
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Action des9 .	LTS
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Action des9 .	LTS
Action will14: Design and install wildlife passage structures that minimize wildlife losses.	Action des9 .	LTS
Action pub3: Establish “gateway” information kiosks.	Action des9 .	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.F-3 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
AIR QUALITY THROUGH CONSTRUCTION ACTIVITIES

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action pub4: Establish a Visitor Education Center.	Action des9 .	LTS
Action tra2: Provide a southern extension to the Fifield/Cahill Ridge Trail.	Actions roa12 and des9 .	LTS
Policy WA15.2: Consider addition of new trails in zones of lesser vulnerability and risk.	Actions roa12 and des9 .	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities, trails, or other agencies, and complete a north-south public trail along the eastern edge of the Watershed.	Actions roa12 and des9 .	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Action des9 .	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

production and spread. These measures include selection of burn days based on air quality, weather conditions, and wind patterns. Therefore, implementation of prescribed burns would not result in significant air quality impacts.

REFERENCES – Air Quality

Except where indicated, references are on file with the San Francisco Planning Department.

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G. FIRE MANAGEMENT

1.0 SETTING

During the summer and autumn “fire hazard months,” the only available precipitation on the Peninsula Watershed is from the condensed water of fog, produced when moist ocean air is pulled onto the Watershed by the rising of warm inland air. High wind speeds control the movement of fog and draw it over the expansive, long ridgetops of the Watershed. It is the fog, along with shrubs and trees that are not easily ignitable, that reduces the potential for fire ignition during the summer season. However, the understory of forests and shrubs are primarily composed of litter (decaying organic matter on the forest floor), which is a source of ignitable material that poses a Watershed fire hazard, especially during drier and warmer weather.

1.1 FIRE RESPONSE AND HISTORY

The Peninsula Watershed is located within a California Department of Forestry and Fire Protection (CDF) State Responsibility Area. The CDF station nearest to the Watershed is the Belmont Station, located at 20 Tower Road in Belmont, approximately one mile from the center of the Watershed. For any fire that is not immediately and easily suppressed, the CDF dispatches firefighters and coordinates response to the fire. The CDF provides many other Watershed services, including inspections, training, and emergency planning.

There has not been a major fire on Watershed lands since 1946. Because of this, there is a large accumulation of fuel material, and the CDF designates this area as a high fire danger area. The *Peninsula Watershed Fire Management Element* provides a history of fire incidents within the Watershed, based on recollection of SFPUC staff and CDF members. The fire history information collected can be used to identify areas where management activities may be warranted. Additional information on fires comes from historical reports contained in the Peninsula Watershed Program and the Statement for Management: Golden Gate National Recreation Area. Several large fires occurred within the 50-year time period from 1877 to 1929. No large fires have been documented since the 1946 fire. A few small fires occurred during the 1960s and 1970s, some of which were characterized as suspicious, related to illegal camping, or the result of fireworks. Historically, large fires have been concentrated in the northern portion of the Watershed. The roads and highways that bisect and border the Watershed have not been a major source of recorded ignitions, but numerous ignitions have occurred off Sawyer Camp Road (commonly known as the Sawyer Camp Trail) and Army Road. No damage to private homes has resulted from wildfires within the Watershed (Wildland Resource Management, 1996).

1.2 ELEMENTS OF FIRE HAZARD AND PROTECTION

Five elements must be considered when addressing fire protection within the Watershed: ignition sources, fire hazard, the resources at risk, fire behavior, and the fire protection system. “Fire hazard” usually refers only to fuel complexes and their ease of ignition and difficulty to

control. However, the overall issue of fire management within the Watershed requires consideration of the other four elements as well.

Ignition Sources

Fire ignition sources must be considered when addressing fire protection. Major ignition sources for wildfires are typically lightning strikes and human actions (illegal campfires, arson, equipment use, discarded matches, and cigarettes). In the Peninsula Watershed, lightning is a fairly uncommon occurrence, leaving human actions as the most prominent source of fire ignition.

Fire Hazard

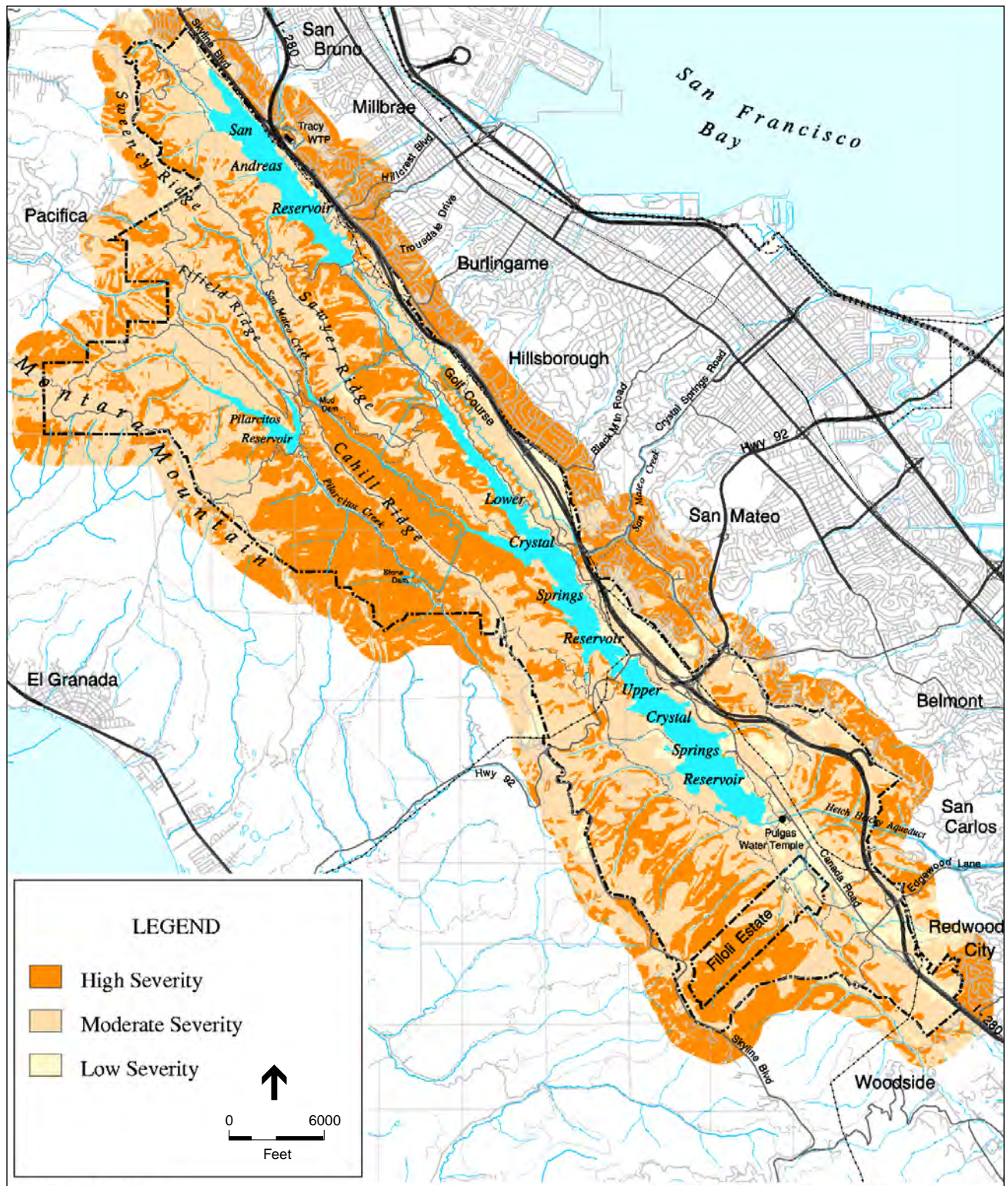
Fire hazard refers to the fuels on a site, typically represented by plant biomass (plant material) and its location and condition, which may lead to difficult-to-control fires. The vegetative fire hazard represented by plant material fuel complexes within the Watershed consists of chaparral, grassland, brush, and certain types of tree stands. (Refer to Section III.E, Natural Resources, for a complete description of vegetative resources within the Watershed.)

Watershed fire hazards have been assessed using three methods:

- Fire hazards (or severity) were mapped in accordance with the California Wildfire Severity Law;
- Static fire behavior predictions (how different types of fuel burn) were estimated using a model from the U.S. Forest Service; and
- Fire spread and growth potential were estimated using a model from the National Park Service.

Figure III.G-1 shows the fire severity categories within the Watershed, in terms of low, medium, and high severity. Severity is measured using estimates of fuel type (e.g., grass, brush, timber), slope steepness, and dwelling density. Results of the fire behavior and growth models are shown for various scenarios on maps contained within the *Peninsula Watershed Fire Management Element*.

In general, the areas designated as high severity are fragmented and are concentrated adjacent to watercourses and tributaries (where vegetation is denser) and on steep slopes. Several large areas of high fire severity are located north of SR 92. One is on the lower slopes of San Mateo Creek and Lower Crystal Springs Reservoir. The large area south of Pilarcitos Lake and the majority of the eastern slope of Sawyer Ridge south of San Andreas Reservoir are also classified as high fire severity. Although outside the Watershed, the residential areas east of I-280 also represent areas of concern with regards to fire hazard. South of SR 92, the area adjacent to the Filoli Estate is also an area of high fire severity.



SOURCE: EDAW, 1998.

Peninsula Watershed Management Plan / 930385 ■

Figure III.G-1
Peninsula Watershed Wildfire Severity

Fuel Type Distribution

Fuel in the natural communities within the Watershed consists of a complex distribution of fuel types, ranging from short grass to heavy timber with substantial understory fuels. The majority of the landscape is dominated by shrub and forest fuel types, with less than 10 percent of the area in grass/herbaceous fuels models.

The majority of the 2,500 acres of grass-dominated areas are on the eastern margin of the Watershed, adjacent to significant urban development and high human use. The high probability of ignition and fast rate of spread associated with these factors indicate significant risk from grass fires. In addition, grass fires could vector fire into adjacent shrub-dominated types. This means that unlike many cases where fire starts in shrubs and would either not sustain itself or only spread very slowly, an adjacent grass fire can generate sufficient heat to initiate crowning (flaming combustion in the upper part of trees or other woody plants).

Of particular concern are chaparral areas surrounded by grasslands, such as in the area south of the SR 92/I-280 interchange and the area immediately west of Belmont near rest stop No. 2. Under extreme weather conditions conducive to fires, where easterly winds are expected, grass fires igniting heavy shrub fuel complexes are likely to cause spotting (when burning embers are deposited into unburned areas) across the rift valley formed by the San Andreas fault, thus starting fires in heavier timbered areas running upslope with the wind, toward developments along Skyline Ridge and Kings Mountain. Thus, although the low fuel loading present in the grass-dominated areas would cause only moderate flames, the high ignition potential and proximity to human-generated ignition sources make the fire hazard particularly severe in this area. These fuel types can be managed with relative ease, but would require a high frequency of management effort.

Roughly 29 percent of the Watershed is northern coastal scrub, with an additional 10 percent in chaparral. Isolated areas of the eastern portion of the Watershed are dominated by chaparral and northern coastal scrub. Isolated areas of chaparral also exist on the lower slopes east of the rift valley, in areas interspersed with both hardwood and, in some areas near the Filoli Estate, conifer types. The majority of the northeastern portion of the Watershed is dominated by northern coastal scrub, with coyote brush being the dominant fuel source. These areas have relatively low ignition potential except where substantial surface litter has accumulated, such as under oak or other trees, or in highly decayed stands. However, once fire becomes established, both high rates of spread and extreme fireline intensity (flame lengths in excess of 20 feet) can be expected during severe fire weather.

Forests dominate most of the western portion of the Watershed, and understories of surface litter provide the driving medium for fire spread. The dense mixed hardwood stands present some of the lowest fire hazard areas to be found in the Watershed. Fire behavior in these areas is likely to be low, and crowning is expected to be isolated to very low-hanging branches. About 4,500 acres, or 20 percent of the Watershed, is represented by this fuel type, and its spatial intermix with other more hazardous fuel types is likely to limit rapid fire spread in these areas.

Large portions (approximately 3,500 acres) of the east-facing slopes of the Watershed are dominated by conifers, many of which are the result of plantings of exotic species. Although most of the coniferous areas have been mapped as moderate fire intensity with slow rates of spread, these systems do have high ignition potential due to an abundance of fine litter fuels, fire ignition detection difficulties, and the likelihood of fires starting in isolated areas. Thus, these systems may well be targets for removal when considering fire suppression as a management tool.

The interior portions of the 3,500 acres, which were assumed to be dominated by conifers, were not subjected to sampling and may in fact be better represented as a mixture of conifer and eucalyptus fuel types. This mixed fuel type has an even greater probability of crowning/spotting. Only isolated stands of conifer and eucalyptus (totaling 70 acres) have been surveyed. Crown fire in the eucalyptus stands east of San Andreas Reservoir could deposit brands (embers) in developed areas in either San Bruno or toward Pacifica, depending on winds. Crowning would likely be widespread under extreme fire weather in the area immediately west of Pilarcitos Reservoir, along the reservoir access road.

Resources at Risk

The resources at risk within the Watershed are represented below in their order of priority and in accordance with established protocol in fire suppression and fire analysis:

1. Personal Safety. This includes the health and well being of SFPUC personnel, the public, and fire service personnel. The greatest threat to safety generally occurs in areas of dense population with poor emergency access (narrow, windy, and steep roads that serve large numbers of people). Such areas do not occur in the Watershed; however, areas of dense populations and poor access occur outside and near the Watershed boundary, creating a threat to safety.
2. Property Values. In general, this refers to high-value resources, such as homes and property items that represent invested resources and high values, and is usually expressed in monetary terms. The Watershed has many resources of considerable value that could be damaged by wildfire, including the Pulgas Water Temple, Watershed keeper cottages, filter plants, and other above-ground structures. In addition, the Filoli Estate is located within the Watershed boundaries, and densely populated residential communities are found along the eastern and northwestern Watershed borders (Millbrae, Hillsborough, San Mateo, Belmont, San Carlos, and Pacifica).
3. Natural Resources. In the Watershed–urban interface, this usually means the flora and fauna on private or public lands, which can be viewed as a public resource for recreation and aesthetics, wildlife habitat, water resources, etc. Fire suppression efforts, which typically require heavy equipment, can damage vegetation and create optimal conditions for invasion for non-native species that may displace native species over time.
4. Water Quality. A vital resource in the Peninsula Watershed is the water that runs off the slopes into the reservoirs below. Water quality and water quantity are unquestionably altered by large wildfires. Ash fallout during a fire can directly damage water quality.

However, increased sedimentation is the leading cause of water quality degradation associated with a large wildfire. Sedimentation also decreases the capacity of the reservoir. Sedimentation is caused both by loss of vegetation that has been burned off of reservoir slopes and by fire suppression methods such as the creation of fuel breaks. Additional water quality impacts can occur from the loss of vegetation, as vegetation normally acts as a natural filter of sediment and other contaminants like coliform and nutrients. Reduced storage capacity and degraded water quality could result in losses and/or delays in service and increased water treatment costs.

Fire Behavior

In general, there are two physical parameters assigned to potential fire behavior:

1. Frontal Fire Behavior. This refers to the advancing fire front, both its capacity to ignite adjacent unburned fuels as well as the relative ease with which it can be contained and extinguished.
2. Spot Fires. This mechanism of fire spread refers to the capacity of a fire to deposit burning brands (embers) into unburned fuel complexes. Spot fires, although accounting for only 1 percent of all wildland fires started in the western United States, are responsible for burning 80 to 96 percent of the area burned (Strauss et al., 1989). The potential for this mechanism to drive fire into a "blow-up" phase was evidenced by the Oakland Hills fire of October 1991, where it is believed that crown fire in trees, and subsequent spotting, dictated the initial rapid advancement of that fire (Sapsis, 1992).

In analyzing of the fire behavior of a site, the critical characteristics include slope, surface fire fuel loading and arrangement, and the presence of stands of tall trees with limbs extending to the ground (these trees create a "ladder" of fuel that transports fire from the ground to the upper tree canopy) (Burgan, 1987; Rothermel, 1983 and 1991). Although conditions contributing to crown fires are relatively rare, when they occur and the tops of trees or vegetation are engaged in flaming combustion, the potential for resultant spot fires is dramatically increased. The role of topography in fire behavior consists of its influence over wind direction, local weather patterns, vegetation types and distribution, and the presence of moisture. Topography can also create microclimates with varying moisture conditions. By influencing the local wind, fuel, moisture, and heat availability, topography directly and indirectly affects the intensity, direction, and spread rate of wildfires. In addition, topography may create impediments to firefighting.

The Peninsula Watershed is characterized by dense forested ridges and steep canyons. Most of the permanent and intermittent streams are in carved valleys with primarily east- and west-facing slopes (average slope steepness is 43 percent). These dense dry forests located on steep slopes create conditions where fires can move quickly and are difficult to combat. Residences along Skyline Boulevard, southwest of the SR 92/Skyline Boulevard intersection, are located on a ridge that falls off precipitously to the north and east. Although these hillsides are steep (average slope steepness is 40 percent), they face north and east and, as a result, are not usually extremely dry, high fire hazard areas. Slopes in the northern portion of the Watershed are steeper than slopes in the southern portion. Overall, slopes in the north have average steepness ranging from

33 to 100 percent. Slopes in the south have average steepness ranging from 20 to 33 percent. Slopes within the valleys and minor drainages on ridgetops are gentler.

The topography is dominated by a northwest-trending rift valley created by the San Andreas fault that traverses the length of the Peninsula. Several northwest-trending ridges and the eastern flank of Montara Mountain are west of the rift valley. Bowls formed by the topography east of Montara Mountain and along Skyline Boulevard are conducive to whirlwind fire storms. West of the San Andreas fault, steep valley side slopes with flat-topped ridges are dominant patterns. Rounded, rolling topography exists southwest of the fault. Spring Valley Ridge and Fifield Ridge are noticeably flat-topped, with gentle, rounded upper slopes and steeper slopes towards the valley bottom.

Weather conditions can influence both the ignition potential of a fire as well as the intensity, rate, and direction of movement of a fire. Wind, temperature, and humidity are the most important weather variables used to predict fire behavior. In particular, wind conditions can affect the intensity of a fire by supplying oxygen to the combustion process. Wind can also accelerate the movement of the fire front by angling flames and transporting embers. In general, winds in the Bay Area blow from the west in the summer and southwest in the winter, while the most severe fire weather occurs with strong north to northeast winds. The steep topography in the Watershed creates its own wind, so that up-canyon drafts in the morning and down-canyon drafts in the afternoon can be expected. In addition, the many canyons can divert the wind so that, for example, a prevailing westerly wind is oriented more to the south.

As described earlier, the weather in the Peninsula Watershed is influenced by its proximity to the coast. The climate is characteristic of the fog belt area in that it is dry and mild in the summer, and cool and moist in the winter. On the average, the area receives between 30 and 45 inches of precipitation a year. In general, most of the measurable rainfall occurs from mid-October to mid-April. Thus, May to October is the time of potential fire danger and constitutes the fire season. The Watershed has a dry season of approximately 150 days per year. However, due to the fog and moisture caused by fog drip, only an average of 15 days are considered to be extreme fire weather conditions. Hot temperatures are more likely to occur in September or October, since coastal fog maintains moderate temperatures during the summer. The sea breeze associated with fog can pose weather-related challenges for fire suppression as frequently as one-quarter of the fire season.

Fire Protection System

The physical properties of an area and the fire protection infrastructure available (equipment, personnel training, etc.) are important elements in determining the capacity of fire service personnel to protect the resources at risk. Site characteristics (such as slope steepness) and infrastructure (such as fire roads and trails) contribute to accessibility by firefighters, and consequently are also an important part of fire hazard analysis. Fire defense improvements include fuelbreaks, roads, water sources, gates, and helispots or heliports and can aid in the effectiveness of fire suppression. All areas within the Watershed that appear to have other

significant protection problems, either due to equipment/accessibility constraints, or significant danger to fire service personnel, deserve special consideration.

Access to the Watershed is provided by I-280, SR 92, Skyline Boulevard, and Cañada Road, as well as other local roads. The Watershed has several maintenance/fire access roads around the San Andreas Basin, the Pilarcitos Basin, Pilarcitos Reservoir, and Stone Dam and along Cahill Ridge, Spring Valley Ridge, and on near-level to rounded crests. The CDF station nearest to the Watershed is the Belmont Station, located at 20 Tower Road in Belmont, approximately one mile from the center of the Watershed.

Developed water sources for fire suppression are limited. There are 13 hydrants on the Watershed. Seven water tanks are scattered on the eastern portion of the Watershed; however, all of them cannot be accessed by SFPUC and CDF staff because of valves that are incompatible with other existing equipment.

Although the goals of resource and personal safety that shape the Management Plan's management actions are clear and self-evident, it should be made explicit that any fire protection system action directed at reducing the risks associated with wildfires cannot completely eliminate the risks associated with fire, but can reduce these risks to some acceptable level, given constraints on the physical and social systems in which they are to be implemented.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for increased risk of fire, but it generally considers that the implementation of the *Peninsula Watershed Management Plan* would result in a significant effect in terms of fire risk if it were to:

- expose people or structures to a substantial risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands;
- substantially interfere with an emergency response plan or emergency evacuation plan; or
- substantially degrade water quality and/or contribute to the destruction of critical habitat for special-status species.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of *Peninsula Watershed Management Plan* actions on fire management in the Watershed, including the following types of actions:

- Road closures and alterations;
- Increase in public access and use; and
- Use of prescribed burns.

Increased Watershed management activities under the Management Plan could spark fires through use of some equipment. However, the level of increased management activities under the Management Plan would not be substantial. Therefore, the increased risk of fire from management activities would be a less than significant impact.

Road Closures and Alterations

The primary goal of the Management Plan is to maintain and improve water quality. Through stormwater runoff, paved and unpaved roads in the Watershed can transport motor oil, gasoline, refuse, and residue from exhaust emissions and create erosion, thus adversely affecting water quality. In order to protect water quality, the Management Plan calls for the elimination and reduction of unnecessary roads. Specifically, implementation of the Management Plan management actions would result in closure and retirement of some roads within the Watershed that are not needed for safety or access for operations. The closure and retirement of roads would minimize problem erosion points and reduce unchecked stormwater runoff by stabilizing the road through regrading, revegetation, and/or restoration. The Management Plan calls for reducing the need for multiple maintenance access roads on infrastructure easements (Action roa5). This action could consolidate roadways and result in closure or retirement of these roads. In addition, the Management Plan would promote revegetation as a method of restricting access on low-use roads, including abandoned roads with sensitive soil types (Action roa8). Roadways provide access for firefighters to reach and control fires within the Watershed and may serve as fuel breaks if the road exceeds 50 feet in width.

Although it is the intent that roads remain passable for emergency access, the management actions discussed above call for identifying and closing roads, which could result in revegetation of roadways. The closure of primarily nonessential roads is necessary to reduce the main cause of sedimentation in the Watershed, but could interfere with emergency response plans. Therefore, implementation of these actions would result in a potentially significant impact.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Table III.G-1 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented. Not every bolded action would be necessary to mitigate the effects of the associated potential impact-causing management action. Because implementation information, such as locations and extent of specific activities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

**TABLE III.G-1
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
FIRE MANAGEMENT DUE TO ROAD CLOSURES AND ALTERATIONS**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action roa5: Reduce the need for multiple maintenance access roads on infrastructure easements by consolidation.	Actions fir2, fir3, fir4, fir5, fir6, fir7 , fir8, and fir12 .	LTS
Action roa8: Restrict access on low-use roads with sensitive soil types and emergent water features by gates or barriers, and allow revegetation.	Actions fir2, fir3, fir4, fir5, fir6, fir7 , fir8, and fir12 .	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

The most important means of reducing potential fire hazard impacts associated with road closures and alterations are to identify and construct road improvements necessary to provide better access and enhance fire suppression capabilities (**Action fir7**). The Management Plan also calls for the preparation and dissemination of maps and information delineating fire response equipment, evacuation routes, and areas of limited suppression (**Action fir12**). Also important are several actions that call for the installation of new fire response equipment and equipment access (Actions fir2 through fir6) and an action that calls for specific fuel management projects (Action fir8).

Implementation of these management actions, as described above and in Section IV.G, would reduce the fire risk (by reducing existing fuel breaks) to a less than significant level. No unavoidable significant program-level fire management impacts related to reduction of existing fuel breaks have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Increase in Public Access and Use

The *Peninsula Watershed Management Plan* includes facilities that could result in increased public visitation of the Watershed by providing new trails (Policies WA15.2 and WA15.4, and Action tra2 [the southern trail extension of the Fifield/Cahill Ridge Trail]), increased information (such as maps and brochures) regarding public activities available on the Watershed, or additional public activity destinations. These facilities include information kiosks (Action pub3) and a Watershed Visitor Education Center (pub4). In addition, provision of universal access improvements could result in increased public use of the Watershed (Action des8). Greater public use of the Watershed could lead to increased incidences of unauthorized uses, such as smoking and campfires/cooking fires. In addition, high-volume off-trail activity and other uses that occur outside designated areas could damage vegetation, resulting in an increase in dry litter that is easily ignitable. New public trails on the eastern margin of the Watershed could be located adjacent grassland areas, indicating a significant risk of grass fires associated with unauthorized use of these trails. More than four out every five forest fires are started by people, and increased human presence, regardless of limits and regulations, translates into an increase in fire frequency (FEMA, 1998). Therefore, implementation of these actions could result in significant risk of wildfire and increased fire hazards that exposes people or structures to a substantial risk or loss, injury, or death.

Table III.G-2 links those actions that could result in impacts with the full range of actions that could be required to reduce the potential impacts. The most important means of reducing potential impacts associated with increased public access is to locate new trails and public facilities on the Watershed periphery in order to reduce fire ignition potential (as well as limit natural resource effects). Policy WA2 prohibits new trails and unsupervised access to existing roads, except for the Fifield/Cahill Ridge access road (see Chapter V). Also important are several actions that call for the installation of new fire response equipment and equipment access

**TABLE III.G-2
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
FIRE MANAGEMENT FROM INCREASED PUBLIC ACCESS AND USE**

Management Actions that Could Result in a Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
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 the plan.	Policy WA2 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and to the trail facilities of other agencies and which help to complete a continuous north-south trail public trail along the eastern edge of the Watershed.	Policy WA2 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS
Action pub3: Establish “gateway” information kiosks at major entryways to the Watershed.	Policy WA2 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Policy WA2 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS
Action tra2: Provide a southern extension to the Fifield/Cahill Ridge Trail.	Policy WA2 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Policy WA2 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

(Action **fir2** through **fir6**) and an action that calls for specific fuel management projects (Action **fir8**). Actions **fir9** through **fir12** set specific guidelines for fire response procedures. In addition, the Management Plan calls for identification and construction of road improvements necessary to provide better access and enhance fire suppression capabilities (Action **fir7**).

Implementation of these fire management actions, as described above and in Section IV.G, would reduce the potential fire impacts from increased public use to a less than significant level. However, the risk of wildfire ignition is still a serious concern. No unavoidable significant program-level fire management impacts related to increased public access and use have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Use of Prescribed Burns

Fire is a naturally occurring ecological phenomenon within virtually all terrestrial communities occupying Mediterranean climates. Limitations on prescribed burns coupled with an active fire suppression program have resulted in a heavy accumulation of fuel within the Peninsula Watershed. This method employs the natural process of combustion to oxidize fuel mass and can be conducted areawide (broadcast) or in restricted spots (pile). Prescribed fire is an effective treatment in that it can be very cost effective, can be implemented in remote and inaccessible areas, and can reduce undesired levels of surface fuels. Prescribed fires are most effective in vegetation types such as grasslands, eucalyptus groves, pine stands, chaparral, or oak woodland, where burns can simulate natural fires and can be controlled. Both broadcast and pile burning are often used in conjunction with manual and mechanical techniques as a way to remove debris. Prescribed fire is deemed an appropriate fire management tool in the *Peninsula Watershed Management Plan* (Policy F11), and several projects in the Fire Management Element call for the use of this technique (Action **fir8**). In addition, Actions **con4** and **wil7** call for use of prescribed fire to control brush and enhance wildlife habitat.

The risks of using fire to modify fuels are primarily from smoke production, exposure of visitors to fire outbreak under difficult rescue conditions, and potential escape of the fire from prescribed burn boundaries. Thus, prescribed burns would pose a potentially significant safety risk to SFPUC staff, visitors, adjacent landowners, and occupants. Use of prescribed fire is also a politically sensitive issue and requires public outreach and education so that concerned citizens may understand the benefits, risks, and process of prescribed burns.

Table III.G-3 links those actions that could result in impacts with the full range of actions that could be required to reduce the potential impacts. The most important means of reducing potential impacts from prescribed burns would be for the CDF to develop and have approved a prescription or burn plan (**Policy F9**). Requirements of the prescribed burn would include:

- Development of preburn plan or prescriptions;

**TABLE III.G-3
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS
FROM USE OF PRESCRIBED BURNS**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Policy F11: Use prescribed fire to control fuels, where appropriate.	Policy F9 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS
Action con4: Use prescribed burns in areas subject to brushy encroachment.	Policy F9 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS
Action wil7: Create palatable re-sprouting through mechanical vegetation treatments or prescribed fire.	Policy F9 and Actions fir2, fir3, fir4, fir5, fir6, fir7, fir8, fir9, fir10, fir11, and fir12.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

- Coordination with regulating agencies to review potential site-specific environmental impacts;
- Issuance of a burn permit from the Bay Area Air Quality Management District;
- Preburn site preparation; and
- Notification of burn to public and neighboring agencies.

Prescribed burns would occur only when conditions permit both adequate combustion and control. Therefore, carrying out prescribed burns requires flexibility in the scheduling of resources in order to respond to weather conditions. Prescribed burns require trained fire protection personnel and would be conducted in coordination with CDF as part of its Vegetation Management Program.

Also important are several actions that call for the installation of new fire response equipment and equipment access (Action **fir2** through **fir6**) and actions that call for specific fuel management projects (Action **fir8**). The Management Plan establishes identification and construction of road improvements necessary to provide better access and enhance fire suppression capabilities (Action **fir7**). Actions **fir9** through **fir12** set specific guidelines for fire response procedures.

Implementation of fire management actions, as described above and in Section IV.G, would reduce the potential impacts from prescribed burns to a less than significant level.

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H. CULTURAL RESOURCES

1.0 SETTING

1.1 ARCHAEOLOGICAL RECORDS

The area in the vicinity of the Peninsula Watershed was intensively occupied during prehistoric times, due to the variety and proximity of resources from the San Francisco Bay, the interior foothills and valleys, and the Pacific Ocean and to the relatively easy access to these areas. There were also creeks and springs that provided drinking water and riparian resources. Evidence indicates that the area was inhabited as early as 5,400 years Before the Present (B.P.) and was likely associated with a pre-Ohlone/Costanoan, possibly Esselen, population. Archaeological sites are documented in coastal areas west of the Watershed lands as well as along the Bay in areas east of the Watershed lands.

There are three identified archaeological sites located within the Peninsula Watershed boundaries. These sites appear to represent major prehistoric villages occupied by the Ohlone/Costanoans and are possibly eligible for inclusion on the National Register of Historic Places. The sites contain extensive artifacts, cultural materials, and evidence of human burial, which is considered a rare finding in San Mateo County, and may represent cultural importance to the local Native American community.

Based on this information and field review of the area, there is potential for additional prehistoric cultural resources to exist on the Watershed lands, including areas submerged by the reservoirs. The abundance of data and scarcity of research indicate that further analysis of prehistory in the Peninsula Watershed and environs would be necessary to characterize this period, which represents a minimum of 3,200 years of prehistory.

1.2 HISTORICAL RECORDS

The historic periods for the Peninsula Watershed can be divided roughly into three periods: Spanish Period (1769 to 1822), Mexican Period (1822 to 1848), and American Period (1848 to 1950s). Numerous historic features and structures associated with these periods are still located within the Watershed lands. These structures include the Spanish San Francisco Bay Discovery Site; expedition campsites and the Feliz adobe location from the Rancho era; homestead, old roadway, hotel and waystation, dairy, sawmill, and American schoolhouse sites; and dam, tunnel flume, keeper's cottage, and facilities from the San Francisco Water Department era.

Spanish Period

At the time the Europeans came to the Peninsula, the area was occupied by the Ohlone, also known to the Spanish as "Costanos." It has been estimated there were between 1,000 to 1,400 Native Americans living in the Peninsula area at that time. The first encounter between Europeans and the native people in San Mateo County occurred in 1769 under the leadership of

Gaspar de Portola. Portola led a group of soldiers across Sweeney Ridge, through what are now Peninsula Watershed lands; these soldiers were the first recorded Europeans to see the San Francisco Bay. A monument on the Watershed marks the approximate location where Portola and his men first viewed the Bay. The monument is listed on the National Register of Historic Places, as a State Historic Landmark, and in the California Inventory of Historic Resources. The site where the Portola expedition camped is also designated as a California State Historic Landmark.

In 1776 Juan Bautista de Anza crossed through the Peninsula Watershed lands to mark a trail that would become known as El Camino Real. De Anza selected the sites of both the Presidio of San Francisco and the Mission Dolores in 1776, and Mission Santa Clara de Asis was established at the south end of the Bay. The Ohlone were brought by force to the Spanish missions, and during the mission period, the Spanish drastically altered the lifestyle of the Ohlone and disease greatly reduced their numbers.

During the Spanish era, the land of Alta California was under sovereign domain. The Peninsula Watershed lands are situated within the boundaries of one of the early Spanish grazing concessions, Rancho de las Pulgas. This 35,240-acre ranch encompassed the southeastern portion of the Watershed lands and was bordered by San Francisco Bay on the east, San Mateo Creek on the north, Crystal Springs Lakes ridge on the west, and San Francisquito Creek on the south.

Mexican Period

During the Mexican period, over 20 land grants were issued in present-day San Mateo County. In addition to Rancho de las Pulgas, the Peninsula Watershed lands are located within Ranchos Cañada de Raymundo, Feliz, San Mateo, San Pedro, and Buri Buri. Various adobe structures were built on each of these ranchos, but only the Domingo Feliz adobe site is known to have existed within or immediately adjacent to the Watershed lands.

American Period

After California became part of the United States in 1848, there were numerous disputes over the validity of Mexican land grants, and by 1860, most of the former rancho properties within the Watershed lands were sold and redistributed to newcomers. During this time, the timber industry had begun in the area and at least three water-powered or stream-driven sawmills were established within the Peninsula Watershed lands in the vicinity of West Union Creek. By the 1850s, homesteads were established along San Andreas, San Mateo, Laguna, and Pilarcitos Creeks, and several dairies were established in the area, including a 1,000-acre dairy farm operated by W.J. Fifield along Pilarcitos Creek, and the 2,500-acre dairy farm operated by R.G. Sneath. From the 1850s to the 1860s, numerous settlements that included schoolhouses, stores, and hotels were built and operated within the Watershed. During this period, the population of Anglo-Americans in San Mateo County increased from about 100 to 3,000, while populations to the north of San Francisco grew from 800 to 57,000.

In order to provide more water for San Francisco, the Spring Valley Water Company began purchasing thousands of acres in San Mateo County. Construction of facilities to transport water to San Francisco began in the 1860s with a small earthen dam on Pilarcitos Creek, and continued through 1890 with the construction of Lower Crystal Springs Dam, a 150-foot-high structure publicized as the largest cement dam in the world. The Lower Crystal Springs Dam is an arched dam of interlocking concrete blocks. Because of this design, which later came into more general use, the dam is designated as a California Historic Civil Engineering Landmark. The dam is also listed on the California Inventory of Historic Resources (Shoup and Hill, 1996).

In 1930, the City of San Francisco purchased the 20,000-acre Spring Valley Water Company's Watershed, which was later organized as the publicly owned San Francisco Water Department. In 1934, the Peninsula Watershed's water system was connected to the Hetch Hetchy system, at the Pulgas Water Temple, where water flowed from the Hetch Hetchy tunnel to Upper Crystal Springs Reservoir. The Pulgas Water Temple, built in 1938, is a Roman Renaissance-style structure that is listed on the California Inventory of Historic Resources.

Known Cultural Resources

Based on archival research and field review of the Peninsula Watershed area, there are 71 distinct archaeological and pre-1946 historical resources located within or immediately adjacent to the Watershed. Table III.H-1 lists these resources and their sensitivity, with the resources grouped into five categories as follows:

- National Register of Historic Places – includes resources that are listed or have been determined eligible for listing. There are two historic resources currently listed: the 1769 San Francisco Bay Discovery Site and the circa 1915 Filoli Estate. Other historic and prehistoric resources may also be eligible, along with several historic structures listed as State Historic Landmarks, California Inventory of Historic Resources, and Historic Civil Engineering Landmarks.
- Historic structures and features – includes pre-1946 water department dams, flumes, tunnels, pump stations, cottages, facilities buildings, fountains, and the Pulgas Water Temple. Most of these resources are still in use and are well maintained by the SFPUC.
- Historic archaeological sites – includes three Spanish exploration camps, a rancho-era adobe, four homesteads, a grave, dairies, hotel, waystation, store, school, sawmills, labor camp, and Watershed dwellings. Most of the historic archaeological sites have not been officially recorded, and the remains of most are either completely destroyed or are not immediately obvious.
- Prehistoric archaeological sites – includes five midden sites recorded with the California Archaeological Inventory and four partially submerged sites that have not been officially recorded.
- Historic Stage Road / the Sawyer Camp Trail – was originally the 1850s San Mateo stageline to Half Moon Bay and later the San Andreas Valley Road.

**TABLE III.H-1
KNOWN CULTURAL RESOURCES OF THE PENINSULA WATERSHED**

No.	Type ^a	Name	Date	Status ^b	Comment	Sensitivity ^c
1	Hist. Struct.	United States Army Radar Installation	early 1950s–70s		not historically important	Low
2	Nat. Reg.	San Francisco Bay Discovery Site	1769	1, 2, 3		High
3	Hist Arch.	North San Andreas Cottage Site	1905		non-historic cottage now at site	High
4	Hist. Arch.	Jersey Farm Dairy Site	circa 1875-1930s			High
5	Prehist. Arch.	San Andreas Lake midden site			inundated, no site record or number	High
6	Prehist. Arch.	San Andreas Lake midden site			inundated, no site record or number	High
7	Hist. Struct.	San Andreas Outlet Tunnel	1870			Low
8	Hist Arch.	Portola Expedition Camp Site	1769	2, 3		High
9	Prehist. Arch.	San Andreas Lake midden site			inundated, no site record or number	High
10	Prehist. Arch.	San Andreas Lake midden site			inundated, no site record or number	High
11	Hist Arch.	Old San Andreas Cottage (Director’s Lodge)	1868		barn still present	High
12	Hist Arch.	Keeper’s Cottage (Babcock House) Site	circa 1875		burnt down ca. 1914, rebuilt ca. 1980	High
13	Hist. Struct.	San Andreas Dam	1868-1870			Low
14	Hist Arch.	Sawyer Labor Camp Site	1868-1870			High
15	Hist. Struct.	Davis Tunnel	1898			Low
16	Hist. Struct.	Davis Tunnel cottage	1899, rebuilt 1937			Moderate
17	Hist Arch.	Fifield Dairy Site	1860s to 1906			High
18	Hist. Struct.	Pilarcitos Dam No. 1	1860-1863			Low
19	Hist. Struct.	Pilarcitos Dam	1864-1867			Moderate
20	Hist. Struct.	Pilarcitos Aqueduct	1862			Low
21	Hist. Struct.	Engineer’s Cottage	1861			High
22	Hist. Struct.	Pilarcitos Cottage	1867			High
23	Hist. Struct.	Pilarcitos Side Flume	1910			High

^a Type Nat. Reg. National Register of Historic Places (listed or eligible) Prehist. Arch. Prehistoric Archaeological Sites
 Hist. Struct. Historic Structures and Features (includes stage roads) Prehist/Ethn. Prehistoric/Ethnohistoric Sites (includes Indian Villages)
 Hist. Arch. Historic Archaeological Sites

^b Status 1 National Register of Historic Places 3 California Inventory of Historic Resources
 2 California Historical Landmarks 4 Historic Civil Engineering Landmarks

^c Sensitivity Based on importance of site, age of site, and current condition.

SOURCE: Environmental Science Associates, 1994

TABLE III.H-1 (Continued)
KNOWN CULTURAL RESOURCES OF THE PENINSULA WATERSHED

No.	Type ^a	Name	Date	Status ^b	Comment	Sensitivity ^c
24	Hist. Struct.	Gate House Forebay	1871 & 1904			Moderate
25	Hist. Struct.	Tunnel No. 1	1860-1861			Moderate
26	Hist. Struct.	San Mateo Dam No. 1 "Mud Dam"	1898			Moderate
27	Hist. Struct.	Tunnel No. 2	1865-1867			Moderate
28	Hist. Struct.	San Mateo Dam No. 2 "Concrete Dam"	1898			Moderate
29	Hist. Struct.	Stone Dam Tunnel No. 2	1898			Moderate
30	Hist. Struct.	Jepson Laurel		3		High
31	Hist. Struct.	Sawyer Camp Cottage	1895, rebuilt 1932			High
32	Hist Arch.	Leander Sawyer Homestead Site	circa 1865			High
33	Hist. Struct.	Fountain				Low
34	Hist Arch.	Stone Dam Keeper's Cottage Site	1892			High
35	Hist. Struct.	Stone Dam and Flume	1871, 1912			High
36	Hist. Struct.	Lock's Creek Aqueduct	1870-1872			Moderate
37	Hist Arch.	Stone Dam former house site				High
38	Hist. Struct.	Lock's Creek Tunnel (Stone Dam Tunnel)	1870			Moderate
39	Hist Arch.	Anthony and Joseph Cahill Homestead Site	circa 1870			High
40	Hist Arch.	Robert Sherwood Homestead Site	circa 1870			High
		Sawyer Camp Trail; San Mateo Stageline to Half Moon				
41	Prehist/Ethn.	Bay/San Andreas Valley Road	1850s		maintained as fire road	Low
42	Hist Arch.	Crystal Springs Hotel Site	1856			High
43	Hist. Struct.	Lower Crystal Springs Cottage (second)	1955			Low
44	Hist. Struct.	Crystal Springs Pump Station	circa 1917		complex includes other structures	Moderate

^a Type Nat. Reg. National Register of Historic Places (listed or eligible)
 Hist. Struct. Historic Structures and Features (includes stage roads)
 Hist. Arch. Historic Archaeological Sites
 Prehist. Arch. Prehistoric Archaeological Sites
 Prehist/Ethn. Prehistoric/Ethnohistoric Sites (includes Indian Villages)

^b Status 1 National Register of Historic Places 3 California Inventory of Historic Resources
 2 California Historical Landmarks 4 Historic Civil Engineering Landmarks

^c Sensitivity Based on importance of site, age of site, and current condition.

SOURCE: Environmental Science Associates, 1994

TABLE III.H-1 (Continued)
KNOWN CULTURAL RESOURCES OF THE PENINSULA WATERSHED

No.	Type ^a	Name	Date	Status ^b	Comment	Sensitivity ^c
45	Hist Arch.	Lower Crystal Springs Cottage Site (first)	1898			High
46	Hist. Struct.	Lower Crystal Springs Dam	1890	3, 4		Moderate
47	Prehist. Arch.	CA-SMa-339			prehistoric midden, 45 x 25 meters	High
48	Hist. Struct.	Upper Crystal Springs Dam	1873-1877			Moderate
49	Hist. Struct.	Springs Bridge Causeway over Highway 92	1891			Moderate
50	Hist Arch.	Portola Expedition Camp Site	1769	2, 3		High
51	Hist Arch.	Upper Crystal Springs Cottage Site	1886		rebuilt 1956	High
52	Hist Arch.	Byrnes Store Site and Mountain House	1934-1936			High
53	Hist Arch.	Laguna Schoolhouse Site	1862		rebuilt after 1870	High
54	Hist Arch.	San Feliz Station Site	1869			High
55	Hist Arch.	Michael Casey Homestead Site	circa 1865			High
56	Hist Arch.	Domingo Feliz Adobe Site	circa 1850			High
57	Hist. Struct.	South Crystal Springs Cottage	circa 1893		possibly National Register site	High
58	Hist Arch.	Anglo-American Grave Site	late 1800s			High
59	Hist Arch.	Portola Expedition Camp Site	1769	2, 3		High
60	Hist. Struct.	Pulgas Water Temple	1938	3		Moderate
61	Prehist. Arch.	CA-SMa-126			prehistoric midden, 50 x 100 meters	High
62	Prehist. Arch.	CA-SMa-147	AD 300-AD 500		midden, 1579 square meters	High
63	Prehist. Arch.	CA-SMa-125			midden, 100 x 100 meters	High
64	Nat. Reg.	Filoli (Bourn-Roth Estate)	1914-1916	1, 2, 3	National Register site	High
65	Hist Arch.	Pinkney Sawmill Site	1855			High
66	Hist Arch.	Albert Smith Sawmill Site	circa 1855			High
67	Hist Arch.	Whipple's Upper Mill (West Union Mill) Site	1852 to 1859			High

^a Type Nat. Reg. National Register of Historic Places (listed or eligible) Prehist. Arch. Prehistoric Archaeological Sites
 Hist. Struct. Historic Structures and Features (includes stage roads) Prehist/Ethn. Prehistoric/Ethnohistoric Sites (includes Indian Villages)
 Hist. Arch. Historic Archaeological Sites

^b Status 1 National Register of Historic Places 3 California Inventory of Historic Resources
 2 California Historical Landmarks 4 Historic Civil Engineering Landmarks

^c Sensitivity Based on importance of site, age of site, and current condition.

SOURCE: Environmental Science Associates, 1994

TABLE III.H-1 (Continued)
KNOWN CULTURAL RESOURCES OF THE PENINSULA WATERSHED

No.	Type ^a	Name	Date	Status ^b	Comment	Sensitivity ^c
68	Prehist. Arch.	CA-SMa-206			prehistoric midden, 150 x 200	High
69	Hist. Struct.	Eastman/Phleger Estate	1920			Moderate
70	Hist Arch.	Swiss Park School, Dance Hall Site	late 1800s			High
71	Hist. Struct.	Donovan Quarry Cottage	1942			Moderate

^a Type Nat. Reg. National Register of Historic Places (listed or eligible) Prehist. Arch. Prehistoric Archaeological Sites
 Hist. Struct. Historic Structures and Features (includes stage roads) Prehist/Ethn. Prehistoric/Ethnohistoric Sites (includes Indian Villages)
 Hist. Arch. Historic Archaeological Sites

^b Status 1 National Register of Historic Places 3 California Inventory of Historic Resources
 2 California Historical Landmarks 4 Historic Civil Engineering Landmarks

^c Sensitivity Based on importance of site, age of site, and current condition.

SOURCE: Environmental Science Associates, 1994

In addition, the Management Plan depicts zones of cultural resource sensitivity. Sensitivity zones generally include valley floors adjacent to water sources, other flat terrain near creeks and springs, and level areas along ridgetops because such locations typify likely areas of human occupation.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for cultural resource impacts, but it generally considers that implementation of the *Peninsula Water Management Plan* would have a significant effect on cultural resources if it were to result in irreversible damage or disruption to:

- an important prehistoric or historic archaeological site;
- a historic resource; a property that is listed or determined eligible for listing on the California Register of Historic Resources or a local register of historic resources, as per Section 5020.1 of the Public Resources Code; or
- a paleontological site (except as part of a scientific study).

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of Management Plan actions on cultural resources in the Watershed, including the following types of actions:

- Increased public access and use; and
- Operations, maintenance, and construction activities.

Increased Public Access

The Management Plan includes facilities that could result in increased public visitation of the Watershed by providing new trails (Policies WA15.2 and WA15.4, and Action tra2 [the southern extension of the Fifield/Ridge Trail]), increased information (such as maps and brochures) regarding public activities available on the Watershed, or additional public activity destinations. These facilities include information kiosks (Action pub3) and a Watershed Visitor Education Center (pub4). In addition, provision of universal access improvements could result in increased public use (Action des8). Greater access could significantly increase in the potential for irreversible damage or disruption of both known and unknown cultural resources. Such disruption could include vandalism or inadvertent damage to cultural resources.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Table III.H-2 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be

**TABLE III.H-2
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
CULTURAL RESOURCES DUE TO INCREASED PUBLIC ACCESS AND USE**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
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 the Management Plan.	Actions saf4 , saf6 , saf10 , and des4.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities and to the trail facilities of other agencies and which help to complete a continuous north-south public trail along the eastern edge of the Watershed.	Actions saf4 , saf6 , saf10 , and des4.	LTS
Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.	Actions saf4 , saf6 , saf10 , and des4.	LTS
Action pub3: Establish “gateway” information kiosks at major entryways to the Watershed.	Actions saf4 , saf6 , saf10 , and des4.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions saf4 , saf6 , saf10 , and des4.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions saf4 , saf6 , saf10 , and des4.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented. Not every bolded action would be necessary to mitigate the effects of the associated potential impact-causing management action. For example, a very minor structure such as a kiosk located in an environmentally non-sensitive area may not require any of the bolded actions to avoid a significant effect. Because implementation information, such as locations of specific facilities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

The most important means of reducing potential impacts on cultural resources are to implement the Management Plan requirements for regular inspection and monitoring of Watershed lands and resources (Actions **saf4**, **saf6**, and **saf10**). In addition, a design and construction action (des4) would fence off sensitive resources and keep visitors away from such resources during construction.

Implementation of these safety, security, and design actions, as described above and in Section IV.H, would reduce the potential impacts to cultural resources from increased public access and use to a less than significant level. Therefore, mitigation measures are not required. No unavoidable significant program-level cultural resources impacts related to increased public access and use have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Construction Activities

Implementation of the Management Plan would result in a number of additional facilities or improvements on the Watershed involving construction projects. Many of the projects would be undertaken to ensure and/or improve water quality or resource protection on the Watershed, such as the installation of barriers or fences along reservoir edges, dams, and identified high-risk spill potential areas (Actions haz4 and haz8); cleanup and enhancement of the Skyline Quarry (Action haz7); installation of barriers on Upper Crystal Springs Dam (Action haz9); installation of infiltration drainfields and detention basins (Action sto1); installation of long-term sediment retention basins or other permanent measures (Action aqu12); rehabilitation of shoreline areas and stream segments (Actions aqu5 and aqu7); improvements that prevent human and animal waste from impacting Watershed resources (Actions was1 and was5); wildlife habitat enhancement through mechanical vegetation or prescribed fire (Action wil7); and installation of wildlife passage structures (Action wil14). Many of the actions listed in the Roads Section of the Management Plan (Actions roa2, roa3, roa4, roa6, roa7, and roa8) would modify or relocate

existing roads or road components in order to reduce potential erosion and Watershed contamination from automobile by-products. Fire management actions include the installation of hydrants, helispots, and water tanks (Actions fir2 through fir5); roadway and access improvements (Actions fir6 and fir7); and implementation of fuel management projects that include constructing fuel breaks, conducting prescribed burns, and other improvements (Action fir8). Construction projects would be generated through actions that would provide additional public use opportunities, such as information kiosks and a Watershed Visitor Education Center (Actions pub3 and pub4), the southern extension of the Fifield/Cahill Ridge Trail (Action tra2), and new trails (Policies WA15.2 and WA15.4). In addition, implementation of Action des8 would result in universal access improvements at SFPUC facilities and trails.

Construction activities could result in potentially significant damage or disruption of both known and unknown cultural resources, particularly during any excavation, surface disturbance, or earthmoving operations.

Table III.H-3 links those actions that could result in impacts with the full range of actions that could be required to reduce the potential impacts. The most important means of reducing potential impacts is the requirement to conduct the appropriate level of review prior to undertaking activities involving surface disturbance and/or excavation to avoid damage to buried cultural resources (Action **cul1**). This action is followed by seven actions (Actions **cul2** through **cul6**) that outline steps that must be taken if cultural resources are found. In addition, Cultural Resources **Policies CR1** through **CR9** 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.

- Implementation of these actions, as described above and in Section IV.H, would reduce the potential impacts to cultural resources from operations, maintenance, and construction activities. However, the Management Plan does not contain policies or management actions specifically prohibiting demolition or inappropriate alteration of historic resources. Therefore, it is possible that such activities could occur, which would constitute a significant effect. Section IV.H.1.0 proposes mitigation that would avoid this potentially significant effect. The impact of day-to-day management activities that implement the Management Plan are analyzed in this EIR and generally would not be subject to further environmental review. No unavoidable significant program-level cultural resources impacts related to operations, maintenance, and construction activities have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

**TABLE III.H-3
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
CULTURAL RESOURCES FROM OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action haz4: Identify key locations for, and install, barriers or fencing to prevent access to reservoir edges and dams.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action haz7: Develop and implement a cleanup and enhancement plan for Skyline Quarry, including slope stabilization.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action haz8: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action haz9: Install barriers on Upper Crystal Springs Dam.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, or detention basins.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection measures.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action aqu7: Rehabilitate stream segments.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action was1: Repair/replace vault, chemical, and composting toilets as necessary.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action was5: Install restrooms on Army Road.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action wil7: Create palatable resprouting through mechanical vegetation treatments or prescribed fire.	Actions cul1 through cul9 and Policies CR1 through CR9 .	LTS
Action roa2: Relocate necessary high-use roads/road segments in proximity to streams.	Actions cul1 through cul9 and Policies CR1 through CR9 .	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.H-3 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO CULTURAL RESOURCES FROM OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action roa3: Modify the grading and drainage of necessary high-use roads/road segments.	Actions cul1 through cul9 and Policies CR1 through CR9 .	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 cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action roa6: Inspect/manage unpaved roads by remediating and stabilizing areas of erosion and regrading unpaved roads.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action roa8: Restrict access on low-use roads by gates or barriers.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action fir2: Install a total of seven hydrants into water sources.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action fir3: Install and maintain a total of five helispots.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action fir4: Install two additional hydrants on adjacent lands.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action fir5: Install two additional water tanks.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action fir6: Undertake road improvements to improve access for fire suppression.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action will14: Design and install wildlife passage structures that minimize wildlife losses.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.H-3 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
CULTURAL RESOURCES FROM OPERATIONS, MAINTENANCE, AND CONSTRUCTION ACTIVITIES

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action pub3: Establish “gateway” information kiosks.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action pub4: Establish a Visitor Education Center.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
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 the Management Plan.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H
Policy WA15.4: Support new trail connections that link to adjacent communities and to the trail facilities of other agencies and which help to complete a continuous north-south trail public along the eastern edge of the Watershed.	Actions cul1 through cul9 and Policies CR1 through CR9 .	PS, see Section IV.H

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

REFERENCES – Cultural Resources

Except where indicated, references are on file at the San Francisco Planning Department.

EDAW, Inc., prepared for San Francisco Public Utilities Commission, *Fifield/Cahill Ridge Trail Element*, Appendix A-3 of the *Peninsula Watershed Management Plan*, 1998.

Environmental Science Associates, prepared for San Francisco Water Department, *Peninsula Watershed Natural and Cultural Resources*, Appendix A-4 of the *Peninsula Watershed Management Plan*, June 1994.

Shoup, L.H and W. Hill, *Historic Property Survey Report, Finding of Effect and 4(f) Statement, Lower Crystal Springs Dam, Pump Station, and Skyline Boulevard Bridge, San Mateo County*, 1996.

I. AESTHETICS

1.0 SETTING

The Peninsula Watershed covers 23,000 acres of the San Francisco Peninsula, encompassing lands on the eastern slope of the Peninsula between Skyline Boulevard (SR 35) and I-280. Land uses adjacent to the Watershed are predominantly residential to the north and east and undeveloped private open space to the west. Land to the south of the Watershed is a mixture of open space and residential, and includes the Filoli Estate. I-280 borders the Watershed to the east, and SR 92 bisects the Watershed between Upper and Lower Crystal Springs Reservoirs. The predominantly natural Watershed contrasts with the heavily urbanized setting to the north, while maintaining the heavily wooded character of the eastern slope of the Santa Cruz Mountains to the south.

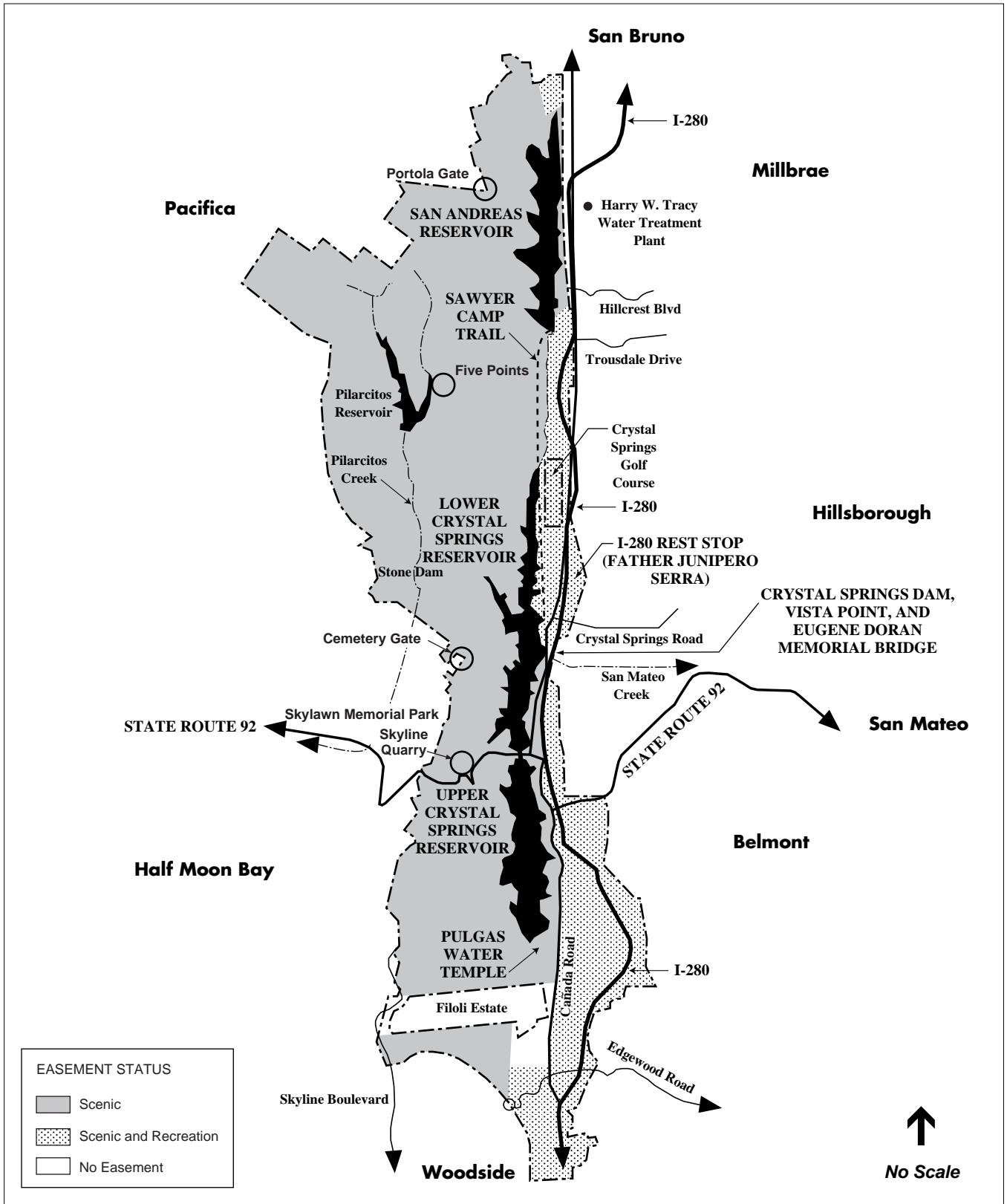
The western slopes of the Peninsula Watershed are heavily forested with a mixture of eucalyptus, Monterey cypress, pine, California bay, and coast live oak. This vegetation transitions to side areas of chaparral and coastal scrub, depending on soil types and slope aspect. The eastern edge of the Watershed lands consists primarily of grasslands with scattered oak woodlands. Key views in the area include Upper and Lower Crystal Springs Reservoirs and San Andreas Lake from I-280; views of Upper and Lower Crystal Springs Reservoirs from SR 92; and views of Lower Crystal Springs Reservoir and San Andreas Reservoir from the Sawyer Camp Trail, a pedestrian/bicycle path that traverses the Peninsula Watershed's recreational easement on the west side of I-280. Features of interest in the area include the Pulgas Water Temple, a large roadside statue of Father Junipero Serra at the I-280 Safety Rest Area, the Eugene Doran Memorial Bridge, and the Crystal Springs Dam and vista point. (See Figure III.I-1 for the location of the key views and features of interest listed above.)

1.1 SCENIC EASEMENT

U.S. Department of the Interior, Golden Gate National Recreation Area – Scenic Easement and Scenic and Recreation Easement

In the mid-1960s, I-280 was constructed southward, with the roadway alignment placed as far east of the SFPUC reservoirs as possible. In conjunction with a relocation of I-280 to the current alignment, a Scenic Easement (19,000 acres) and a Scenic and Recreation Easement (4,000 acres) were developed to serve as a four-party agreement among the SFPUC, the U.S. Department of the Interior, Caltrans, and San Mateo County. These easements were developed to preserve the Watershed as open space in order to protect water quality.

Under the legal terms of the easements, the SFPUC is permitted to conduct any activity on its lands as long as it is consistent with the terms of the easement, the City's reserved rights, and the collection, storage, and transmission of water. The Scenic and Recreation Easement allows for a Scenic Highway (SR 35 – Skyline Boulevard) and trails for hiking (Sawyer Camp Trail). The easement states:



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

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Figure III.I-1
Key Views and Features of Interest

- 1) The land shall be preserved in its present natural state and shall not be used for any purpose other than for the collection, storage and transmission of water and protection of water quality, and other purposes which shall be compatible with said use and preserving said land as open-space land;
- 2) No structures shall be erected upon said land except such structures as may be directly related to and compatible with the aforesaid uses. No trailer shall be placed, used or maintained on said land as a substitute for a caretaker's residential building. The design and location of all buildings except water utilities buildings and appurtenances, shall be subject to the concurrence of a regional representative of the Department of the Interior to be designated by the Secretary of the Interior;
- 4) No signs, billboards, or advertisements excepting directional signs and identification signs in connection with permitted uses, shall be displayed or placed upon the land;
- 6) Except as required to accomplish the improvements hereinafter permitted or as otherwise permitted to the Grantor hereunder, the general topography of the landscape shall be maintained in its present condition and no substantial excavation or topographic changes shall be made without the concurrence of a regional representative of the Department of the Interior to be designated by the Secretary of the Interior; and
- 7) Except as required to accomplish the purposes and uses herein permitted to Grantor, there shall be no cutting or permitting of cutting, destroying or removing any timber or brush without the concurrence in writing by a regional representative of the Department of the Interior to be designated by the Secretary of the Interior.

1.2 SCENIC CORRIDORS

Key observation points within and around the Watershed have been identified based on federal, state, and county plans and include the following: I-280, SR 92, Skyline Boulevard (SR 35), Cañada Road, Crystal Springs Dam and vista point, and Sawyer Camp Trail. Roads were identified based on designation in appropriate state or county plans as scenic routes. Other areas were identified based on their importance, use volume, use duration, and size. These areas are discussed below under Section 1.3, Special Use Areas and typically include designated vista points, trails, parks, and secondary roads to and from regional parks.

Interstate 280

I-280 (Junipero Serra Freeway) forms the rough dividing line between the urban and rural areas of San Mateo County and provides extensive views of the natural landscape to the west, including large expanses of rolling hills, forested slopes of the Santa Cruz Mountains, and Crystal Springs Reservoir. The portion of I-280 between San Francisco and State Highway 17 is included in the *California Master Plan of State Highways Eligible for Official Scenic Highway Designation*. The portion of I-280 from the Santa Clara County line to Sneath Lane in San Bruno is officially designated as a state scenic route.

Views from I-280 include large areas of the east-facing slopes of the Peninsula Watershed. The viewshed of I-280 is generally free from extensive development throughout the stretch of

highway that passes through or along the Peninsula Watershed. While a limited amount of residential development is visible to the east, the Watershed lands to the west are undeveloped and show little or no signs of development as viewed from the freeway. The Crystal Springs Golf Course is between I-280 and the northern portion of Lower Crystal Springs Reservoir. The majority of the golf course is screened from view by a dense stand of cypress trees on the western side of the freeway. Views of the golf course are limited to a short stretch from the southbound travel lanes near the I-280 / Black Mountain Road Interchange.

The few developed features visible from the freeway include a transmission line that crosses the freeway in the vicinity of Black Mountain Road and the I-280 / SR 92 interchange, which includes several prominent overcrossing ramps. Views of San Andreas Reservoir and Upper and Lower Crystal Springs Reservoirs from the freeway are intermittent. Lands immediately surrounding the highway are grasslands. The slopes of the Watershed to the west of the highway consist of a mixture of cypress trees, with larger areas of mixed coniferous forest. Chaparral and coastal scrub cover the south-facing slopes, while mixed coniferous forest are primarily located in the narrow valley bottoms and draws. The most visible portions of the Watershed are the heavily forested upper slopes of Sawyer and Cahill Ridge.

Four vista points are located along the stretch of I-280 that provides views of Watershed lands. These vista points are identified as follows:

Vista Point No. 1. This vista point is located on the eastern side of I-280, approximately 0.75 mile north of Edgewood Road. This site is identified as "Panoramic Overlook" on Exhibit A of the Grant of Scenic Easement for the Peninsula Watershed.

Vista Point No. 2. This vista point is located on the eastern side of I-280 approximately two miles north of Edgewood Road. This site is identified as "Vista Point" on Exhibit A of the Grant of Scenic Easement for the Peninsula Watershed.

Vista Point No. 3. This vista point is located on the western side of I-280, approximately 2.5 miles north of Edgewood Road. This site is identified as "West Vista Point" on Exhibit A of the Grant of Scenic Easement for the Peninsula Watershed.

I-280 Safety Rest Area. This Caltrans rest area is located on the east side of I-280 between the Eugene Doran Bridge (San Mateo Creek) and the Bunker Hill / I-280 interchange.

As viewed from these vista points, the Peninsula Watershed lands appear as undeveloped and natural open space. Vista points 1, 2, and 3 are located relatively high on the hillsides along I-280, and the elevated positions offer a panoramic view of the forested slopes of the Peninsula Watershed as well as prominent views of the three reservoirs in the San Andreas Valley. Vista points 1 and 2 also provide for extensive views of the highly urbanized San Mateo County area and the San Francisco Bay to the east.

Relatively few man-made features are visible within or adjacent to the Peninsula Watershed from these vantage points. Portions of SR 92 are visible on the east-facing slopes above Upper and Lower Crystal Springs Reservoirs, and several antennas and small structures are visible on the

skyline in the vicinity of the SR 92 and SR 35 intersection. However, these features are small in scale and are not highly noticeable. Each of the vista points is located well off the main freeway, and while this separation provides for a higher quality viewing experience, the number of visitors is likely to be relatively low because travelers on the freeway are offered little incentive to stop.

The Safety Rest Area is located adjacent to I-280, with an easily accessible parking area and restroom facilities. Due to the ease of access from the freeway and the prominent and distinctive statue of Junipero Serra, the rest area and associated viewpoint likely receives more visitation than the three vista points previously discussed. A pathway leads to a viewpoint at the base of the large statue of Junipero Serra. Views at this location are oriented to the west, and include the freeway, Lower Crystal Springs Reservoir, and the forested slopes below Sawyer Ridge.

State Route 92

SR 92 is neither an officially designated state scenic highway nor is it identified on the Scenic Highway Master Plan. SR 92 is, however, identified as a San Mateo County scenic corridor. In addition, the SFPUC lands through which the highway passes are within the boundary of the Scenic Easement and Scenic and Recreation Easement described previously.

From west to east, views of SFPUC Watershed lands from SR 92 begin at the summit of the Santa Cruz Mountains (Skyline Boulevard / SR 92 intersection). Panoramic views to the east are available from the area around the intersection. As SR 92 curves down the eastern slope of the Santa Cruz Mountains, views become enclosed by dense stands of trees and shrubland. These trees include large stands of Monterey cypress that, in addition to blocking views from the road, serve to block views of the road and associated roadcuts from a variety of locations to the east, including I-280. Continuing eastward, SR 92 passes between Upper and Lower Crystal Springs Reservoirs on a causeway that provides views of both reservoirs and of the grass-covered hillsides to the east for eastbound motorists and the densely forested slopes of Cahill Ridge. A portion of the upper slopes of the abandoned Skyline Quarry, located north of SR 92 on the shoreline of Lower Crystal Springs Reservoir, is visible from westbound SR 92.

State Route 35

SR 35 (Skyline Boulevard) follows the western boundary of the Peninsula Watershed along the summit of the Santa Cruz Mountains south of the SR 35 / SR 92 intersection. From this point, SR 35 and SR 92 form a combined route that winds down through the Peninsula Watershed, before crossing between Upper and Lower Crystal Springs Reservoirs on a causeway. East of the causeway, SR 35 is routed north along the eastern shore of Lower Crystal Springs Reservoir, crossing over Crystal Springs Dam before climbing a steep grade and eventually connecting to I-280.

SR 35 is included in the *California Master Plan of State Highways Eligible for Official Scenic Highway Designation*. The portion of SR 35 from the Santa Cruz-San Mateo County boundaries to SR 92 in San Mateo County has been officially designated as a state scenic route. The road is

also designated as a scenic route by Santa Clara and San Mateo Counties. A scenic access point is located at the SR 92 / SR 35 intersection. This area provides views of Upper Crystal Springs Reservoir and grasslands in the eastern portion of the Watershed.

Foreground views from this area include stands of Monterey cypress and chaparral/coastal scrub. In general, the viewshed of SR 35 along the western boundary of the Peninsula Watershed is extremely limited, screened by the dense stands of evergreen trees along both sides of the road. Views to the west occasionally open up; however, views to the east into the Watershed are blocked by roadside vegetation. The landscape as viewed from SR 35 is generally undeveloped and natural in appearance. Intermittent views of residences occur as the road curves along the ridgetop. In addition, there are occasional views of Skylawn Memorial Park from SR 35 immediately south of SR 92.

From SR 35 on the eastern side of Lower Crystal Springs Reservoir, expansive views are available of the reservoir and of the forested slopes of the Peninsula Watershed. This section of SR 35 offers views of the reservoir as the road crosses over the top of Crystal Springs Dam and views of the San Mateo Creek canyon and the Eugene Doran Bridge. North of Crystal Springs Road, both sides of the relatively narrow, two-lane SR 35 are often crowded with parked cars from visitors using the Sawyer Camp Trail.

Cañada Road

Cañada Road traverses the eastern side of San Andreas Valley, running through SFPUC lands. Cañada Road offers a relatively quiet bypass to I-280 for leisurely driving and is a popular recreational bicycle route. The road is closed to automobile traffic by the San Mateo County Parks and Recreation Department three weekend days each month between Edgewood Road and State Route 92 for exclusive recreational use by runners, hikers, and bicyclists. The intersection of Edgewood Road and Cañada Road is a popular parking and staging area for cyclists and runners that use the closed portion of the road on Sundays. Cañada Road offers extensive views of the forested Santa Cruz Mountains, the grass-covered hills on the east side of the valley, Upper Crystal Springs Reservoir, and the Pulgas Water Temple.

1.3 SPECIAL USE AREAS

Pulgas Water Temple

The Pulgas Water Temple is located south of the Upper Crystal Springs Reservoir, east of Cañada Road. It consists of a Roman Renaissance-style structure and pool, surrounded by manicured lawns, landscaping, and a parking lot. Views to the west from the temple consist of heavily forested Watershed lands. Views to the east from the temple consist of Cañada Road and undeveloped grassland.

Crystal Springs Dam and Vista Point

Crystal Springs Dam and vista point are located near the intersection of SR 35 and Crystal Springs Road on the east shore of Lower Crystal Springs Reservoir. This site is heavily used as a staging area/trailhead for the Sawyer Camp Trail, which begins just north of the dam and vista point and heads north along the shoreline of the reservoir. SR 35 crosses over the top of Crystal Springs Dam and provides extensive, close-range views of the dam itself (completed in 1890 and designated as a state historic Civil Engineering Landmark), Lower Crystal Springs Reservoir, the steep and heavily forested San Mateo Creek drainage, and the Eugene Doran Bridge spanning the canyon to the east of the dam. The extreme height of the Eugene Doran Bridge, its curvilinear support columns, and the surrounding natural areas combine to provide high-quality views. A vista point is located on the western side of SR 35 immediately north of the dam. The vista point includes a small parking area and informational signage. The existing shoreline vegetation at the site partially blocks views of the Lower Crystal Springs Reservoir and the forested Watershed lands (SFWD, 1994).

Existing Recreational Trails

Public recreational opportunities are available within the Scenic and Recreation Easement, including Sawyer Camp Trail, Sweeney Ridge Trail, Sheep Camp Trail, San Andreas Trail, Crystal Springs Trail, Ralston Trail, and Edgewood Trail. Most of the trails are located along the eastern edge of the Watershed, near I-280. The Sawyer Camp and Sweeney Ridge Trails are discussed below.

Sawyer Camp Trail. The Sawyer Camp Trail is a popular recreational pedestrian/bicycle trail that traverses the eastern edge of the Peninsula Watershed between San Andreas Reservoir and Crystal Springs Dam. The trail is routed to the east of San Andreas Lake, then crosses over the dam at the south end of the lake before traversing a relatively remote and heavily forested area in the San Andreas Valley between San Andreas Reservoir and Lower Crystal Springs Reservoir. The trail is then routed along the east shoreline of Lower Crystal Springs Reservoir until it connects with Skyline Boulevard at Crystal Springs Dam. The trail is fenced on the reservoir side, and Watershed access is prohibited. Views from the trail include a variety of grassland, oak woodland, and dense riparian vegetation communities. In some locations, the trail is heavily screened and shaded and the reservoir water surface is not visible. At other locations, the shoreline vegetation is low and allows panoramic views of the water surface of the reservoir and of the forested slopes of the Watershed lands. At certain times, the drawdown of the reservoir leaves a noticeable line of exposed soil above the water surface. I-280 is not a highly noticeable feature of views from the trail (EDAW, Inc., 1994).

Sweeney Ridge Trail. The Sweeney Ridge Trail is located in the northern portion of the Watershed and extends from Sneath Lane to the Portola Gate. The paved trail is operated and maintained by the Golden Gate National Recreation Area, which holds an easement for the trail area. The trail route extends from a parking area at the southern extent of Sneath Lane to the Portola gate. The trail route consists primarily of grasslands with scattered areas of chaparral,

coastal scrub, and oak woodlands. Points of interest include the Nike missile site and the Portola Discovery Site. Views from the trail area include the cities of Millbrae and Burlingame, the San Francisco Bay, and Mount Diablo to the east and undeveloped ridges, the Farallon Islands, and Mount Tamalpais to the west and north.

Proposed Trails

In addition, several new recreational trails have been proposed, or approved for nearby areas. San Mateo County has developed a countywide Trails Plan (1995) that presents potential connection trails to the three Bay Area regionwide trail systems: the Bay Trail, which circles the Bay's shoreline; the Bay Area Ridge Trail; and the Coastal Trail, which runs along the Pacific Ocean shoreline. The Trails Plan proposes connector trails between points on the trail systems and other County trails in County parks, open space preserves, public lands, and private lands. Specific alignments are not proposed nor have any agreements been established with other agencies for right-of-ways. In addition, planned trail projects include the Crystal Springs Spur Trail and San Francisco Watershed Spur Trail (Junipero Serra County Park to the Watershed) and the recent Crystal Springs Trail North connecting Sawyer Camp Trail with Crystal Springs Trail South.

Crystal Springs Golf Course

The Crystal Springs Golf Course is located northwest of the I-280 / Crystal Springs Road intersection. The golf course is sited between I-280 and Lower Crystal Springs Reservoir. The Sawyer Camp Trail is located approximately 0.5 mile west of the golf course. As stated previously, views of the golf course from I-280 are for the most part screened from view.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for aesthetic quality, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant effect on aesthetic quality if it were to:

- have substantially negative aesthetic effects;
- substantially degrade or obstruct scenic views from public areas;
- substantially violate the scenic easement relegated to the U.S. Department of the Interior (implemented by the National Park Service – Golden Gate National Recreation Area); or
- produce substantial light or glare.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of *Peninsula Watershed Management Plan* actions on the aesthetic quality of the Watershed, including the following types of actions:

- Installation of new facilities;
- Vegetation clearing activities; and
- Increased public access areas.

Installation of New Facilities

Implementation of the Management Plan would result in a number of additional facilities on the Watershed. Many of the facilities would be installed to ensure and/or improve water quality or resource protection on the Watershed, such as barriers or fences along reservoir edges, dams, and identified high-risk spill potential areas (Actions haz4 and haz8); barriers on Upper Crystal Springs Dam (Action haz9); and restrooms on Army Road (Action was4). Other facilities would be installed to facilitate public use of the Watershed, including information kiosks, a Watershed Visitor Education Center (Actions pub3 and pub4), and new trails (Policies 15.2 and 15.4 and Action tra2). Fire management actions include the installation of helispots and two water tanks, and access and road improvements (Actions fir3 through fir7). In addition, new roads could be built or existing roads could be relocated (Actions roa2 and roa3).

Installation of all of the facilities described above would constitute a potentially significant aesthetic change, with the degree of change dependent on project-specific details to be determined at the time projects were proposed. The aesthetic change would be significant if the site selection, facility scale, or facility design caused substantial degradation of the scenic quality of the Watershed from public areas or violated the scenic easement. Further, if lighting associated with the facilities created substantial glare, the impact would be significant.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Table III.I-1 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented. Not every bolded action would be necessary to mitigate the effects of the associated potential impact-causing management action. For example, a very minor structure such as a kiosk located in an environmentally non-sensitive area may not require any of the bolded actions to avoid a significant effect. Because implementation information, such as locations of specific facilities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for

**TABLE III.I-1
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
AESTHETIC QUALITY THROUGH INSTALLATION OF NEW FACILITIES**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action haz4: Install barriers or fences to prevent access to reservoir edges and dams.	Actions des5 , veg1, and veg9.	LTS
Action haz8: Identify high-risk spill potential areas and implement measures (e.g., fines, barricades, etc.).	Actions des5 , veg1, and veg9.	LTS
Action haz9: Install barriers on Upper Crystal Springs Dam.	Actions des5 , veg1, and veg9.	LTS
Action was5: Consult with GGNRA to install restrooms on Army Road.	Actions des5 , veg1, veg9.	LTS
Action roa2: Relocate necessary high-use roads/road segments in proximity to streams.	Actions roa12 , veg1, and veg9.	LTS
Action roa3: Modify the grading and drainage of necessary high-use roads/road segments.	Actions roa12 , veg1, and veg9.	LTS
Action fir3: Install a total of five helispots.	Actions des5 , veg1, and veg9.	LTS
Action fir4: Install two additional water tanks.	Actions des5 , veg1, and veg9.	LTS
Action fir5: Install two additional metal water tanks.	Actions des5 , veg1, and veg9.	LTS
Action fir6: Undertake physical improvements to provide better access.	Actions roa12 , veg1, and veg9.	LTS
Action fir7: Identify and construct road improvements to provide better access.	Actions roa12 , veg1, and veg9.	LTS
Action pub3: Establish information kiosks at Watershed entryways.	Actions des5 , veg1, and veg9.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions des5 , veg1, and veg9.	LTS
Policy WA15.2: Consider additional new trails in zones of lesser vulnerability and risk.	Actions roa12 , veg1, and veg9.	LTS

^a See accompany text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.I-1 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
AESTHETIC QUALITY THROUGH INSTALLATION OF NEW FACILITIES

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Policy WA15.4: Support new trail connections that link to adjacent communities, trails, other agencies, and complete a north-south public trail along the eastern edge of the Watershed.	Actions roa12 , veg1, and veg9.	LTS
Action tra2: Provide southern extension of the Fifield/Cahill Ridge Trail.	Actions roa12 , veg1, and veg9.	LTS

^a See accompany text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

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implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

The most important means of reducing potential aesthetic quality impacts are design practices that reduce the overall aesthetic effect of new roads and facilities. The Management Plan includes road design guidelines (Action **roa12**) that require use of best management practices for road location and alignment, such as locating and designing roads and trails to follow natural topography; minimizing stream crossings; avoiding large cut-and-fill road designs; and minimizing excavation. The Management Plan also includes facility design guidelines (Action **des5**) with several requirements for new construction activities or renovation/alteration of existing facilities, such as:

- Where grading is necessary, contour slopes and landforms to mimic the surrounding environment as much as possible;
- Design and site new roads and trails to minimize grading and the visibility of cut banks and fill slopes;
- 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 only seen in the foreground, and the break in the skyline is a minimum necessary to provide the required service;
- Incorporate architectural siting/design elements that are compatible with the applicable surroundings;
- Eliminate, wherever possible, the use of unpainted metallic surfaces and other sources that may cause increased levels of reflectivity;
- Direct downward and site and shield new exterior lighting such that it is not highly visible or obtrusive;
- Maintain the silhouette of new structures below the skyline of bluffs, cliffs, or ridges;
- Design any new structural additions to historic structures to harmonize with older structural features and comply with scenic easements and aesthetic guidelines; and
- Encourage the salvage and selective reuse of building features if historic structures are demolished.

In addition, the Management Plan includes other actions that would further reduce the aesthetic effect of new facilities and roads, when incorporated along with the roads and facility design guidelines described above. Action **veg1** requires that disturbed areas be screened and restored with an appropriate mix of native vegetation species. Action **veg9** requires erosion-control best management practices for all construction activities in order to retain vegetation, wherever feasible, and to minimize the total area and duration of soil exposure. Implementation of Actions **veg1** and **veg9** would ensure that only a minimum area is devegetated for facilities construction and that devegetated areas do not remain bare following the construction period.

Implementation of design guidelines and vegetation protection and restoration activities, as described above and in Section IV.I, would reduce the potential aesthetic impact associated with the installation of new facilities and roads to a less than significant level. Therefore, mitigation measures are not required. No unavoidable significant program-level aesthetic quality impacts related to installation of new facilities have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Vegetation Clearing Activities

The fuel management projects to be implemented as part of Action fir8 include tree pruning, understory removal, and prescribed burns, among other activities. In addition, Actions con4 and wil7 call for use of prescribed burns for brush removal and for enhancement of wildlife habitat. These activities could result in disturbance of relatively large portions of vegetation in the Watershed, including creation of devegetated, blackened areas. The aesthetic change associated with implementation of Action fir8 would be potentially significant. The degree of aesthetic change is dependent on the size and location of the disturbed area, which would be determined prior to implementation of the fuel management projects. The aesthetic change would be significant if the disturbed areas are located within the public viewshed or the scenic easement and if the disturbed area is not restored. However, it should be noted that without implementation of Action fir8, a catastrophic fire could occur on the Watershed, which could result in more severe aesthetic effects.

Removal of invasive exotic plant and tree species and use of mechanical vegetation treatments by implementing Actions veg6, veg7, and wil7 would also result in devegetated areas. To some degree, Action veg7 is self-mitigating in that the action requires that native vegetation be used to replant areas where exotic forest species are removed and that significant stands of exotic species be preserved. However, implementation of Actions veg6, veg7, and wil7 would result in a potentially significant aesthetic change. The degree of change would depend on the size and location of the disturbed area, which would be determined prior to implementation of exotic plant and tree removal projects. The aesthetic change would result in significant degradation of scenic views if the activities were large in scale, were conducted in areas visible to the public, and if restoration of the area did not occur.

Table III.I-2 links those actions that could result in impacts with the full range of actions that could be required to reduce the potential impacts. The most important means of reducing potential aesthetic quality impacts associated with implementation of the fire management projects is Action **veg5**, which would require development of a native species planting program for areas disturbed during fire management activities. In addition, Action **veg1** would require that prescribed burns be conducted under conditions that would not harm plant species that reproduce through seed only, and that disturbed areas be screened and restored with an

**TABLE III.I-2
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
AESTHETIC RESOURCES THROUGH VEGETATION-CLEARING ACTIVITIES**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action fir8: Complete the fuel management projects.	Actions veg1 , veg5 , and veg9.	LTS
Action veg6: Identify and remove invasive exotic plant species.	Actions veg1 and veg9.	LTS
Action veg7: Identify and remove stands of exotic forest species.	Actions veg1 and veg9.	LTS
Action con4: Use prescribed burns in areas subject to brushy encroachment.	Actions veg1 , veg5 , and veg9.	LTS
Action wil7: Create palatable resprouting through mechanical vegetation treatments or prescribed fire.	Actions veg1 , veg5 , and veg9.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

appropriate mix of native vegetation species. Restoration and screening of disturbed areas would be the most important means of reducing potential aesthetic quality impacts associated with exotic plant and tree removal. Action veg9 would further reduce the aesthetic effect associated with fire management and plant and tree removal activities by retaining existing vegetation wherever feasible, and minimizing the total area and duration of soil exposure.

Implementation of these vegetation protection and restoration actions, as described above and in Section IV.I, would reduce the potential aesthetic impact associated with fire management and plant and tree removal activities to a less than significant level. The impact of day-to-day management activities that implement the Management Plan are analyzed in this EIR and generally would not be subject to further environmental review. No unavoidable significant program-level aesthetic quality impacts related to vegetation clearing activities have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

Increased Public Access and Use

The *Peninsula Watershed Management Plan* includes facilities that could result in increased public visitation of the Watershed by providing new trails (Policies WA15.2 and WA15.4 and Action tra2), increased information (such as public use area maps and brochures) regarding public activities available on the Watershed, or by providing additional public activity destinations. These facilities include information kiosks (Action pub3) and a Watershed Visitor Education Center (Action pub4). In addition, provision of universal access improvements could result in increased public use of the Watershed (Action des8). Increased public use would not necessarily result in adverse impacts to aesthetic resources. However, trespassing and improper use of public access areas could lead to litter, disturbed vegetation, and damage to Watershed facilities and resources, detracting from the aesthetic quality of the Watershed. Litter, disturbed vegetation, and damage to facilities and resources would constitute a significant effect, if the degradation of aesthetic quality were substantial.

Table III.I-3 links those actions that could result in impacts with the full range of actions that could be required to reduce the potential impacts. The most important means of reducing potential impacts are to advocate responsible use of the Watershed and enforce the rules and regulations established for use of the Watershed. Actions **pub8** and **pub9** would increase public education and awareness of Watershed resource sensitivity and would publish rules and regulations for Watershed visitors. This information would be provided in all areas subject to public use, including the kiosks, the Watershed Visitor and Education Center, and the mobile exhibit. Actions **saf4** and **saf6** require an inspection and maintenance program for facilities used by the public and inspection of perimeter fencing, access gates, and locks in order to minimize trespassing and illegal dumping. In addition, Action **saf16** would establish coordinated enforcement of public use of the Watershed with the Golden Gate National Recreation Area and San Mateo County agencies.

**TABLE III.I-3
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
AESTHETIC RESOURCES THROUGH INCREASED PUBLIC ACCESS AND USE**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action pub3: Establish information kiosks at Watershed entryways.	Actions saf1, saf2, saf4, saf6 , saf10, saf16 , saf17, pub8, pub9 , and pub12.	LTS
Action pub4: Establish a Watershed Visitor Education Center.	Actions saf1, saf2, saf4, saf6 , saf10, saf16 , saf17, pub8, pub9 , and pub12.	LTS
Policy WA15.2: Consider additional new trails in zones of lesser vulnerability and risk.	Actions saf1, saf2, saf4, saf6 , saf10, saf16 , saf17, pub8, pub9 , and pub12.	LTS
Policy WA15.4: Support new trail connections that link to adjacent communities, trails, or other agencies, and complete a north-south public trail along the eastern edge of the Watershed.	Actions saf1, saf2, saf4, saf6 , saf10, saf16 , saf17, pub8, pub9 , and pub12.	LTS
Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.	Actions saf1, saf2, saf4, saf6 , saf10, saf16 , saf17, pub8, pub9 , and pub12.	LTS
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions saf1, saf2, saf4, saf6 , saf10, saf16 , saf17, pub8, pub9 , and pub12.	LTS

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

The Management Plan also includes actions that, when implemented with those actions described above, would further reduce the potential aesthetic quality impact associated with litter, disturbed vegetation, and damaged facilities. Actions saf1, saf2, saf10, and saf17 provide additional means for monitoring public use of the Watershed and enforcing Watershed rules and regulations. Action pub12 requires coordination with other agencies and groups in the development of educational materials, further providing the opportunity for dissemination of information advocating responsible use of the Watershed.

Implementation of the public education and enforcement actions, as described above and in Section IV.I, would reduce the potential aesthetic impacts associated with improper public access and use of the Watershed to a less than significant level. No unavoidable significant program-level aesthetic quality impacts related to increased public access and use have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

REFERENCES – Aesthetics

Except where indicated, references are on file at the San Francisco Planning Department.

EDAW, Inc., prepared for San Francisco Water Department, *Technical Memorandum No. 4: Visual Resources*, Appendix C-5 of the *Peninsula Watershed Management Plan*, 1994.

J. TRANSPORTATION AND ACCESS

1.0 SETTING

A total of 100 miles of paved roads and 60 miles of unpaved roads and trails are within the Peninsula Watershed. The road system consists of approximately 52 miles of highways and ramps, 48 miles of paved roads and streets, 35 miles of unpaved roads, and 25 miles of trails. The paved and unpaved access roads are used by the Watershed keepers to patrol the Watershed and by operations personnel who maintain the water system; these roads also serve as fire trails.

The Peninsula Watershed area is served by a roadway network that includes I-280, SR 92, and SR 35 (Skyline Boulevard), as well as arterial, collector, and local roadways. The roadways serve varied purposes, primarily for weekday commute trips and weekend recreational trips. Approximately 14 miles of I-280 traverse the Peninsula Watershed, with a number of interchanges (Larkspur-Hillcrest; Black Mountain Road; SR 92; Edgewood Road; and South Cañada Road) providing local access to the adjacent suburban-developed areas. The I-280 freeway carries about 95,000-110,000 vehicles per day (vpd) in this area (Caltrans, 1999). SR 92 connects the cities of San Mateo and Half Moon Bay and bisects the Watershed between the Upper and Lower Crystal Springs Reservoirs; it carries about 24,000 vpd (Caltrans, 1999). SR 35 (Skyline Boulevard) parallels I-280 along the eastern boundary of the Watershed north of SR 92, joins SR 92 and crosses the Watershed, and then extends south from SR 92 along the western boundary of the Watershed. SR 35 carries about 5,300 vpd north of SR 92 and about 2,500 vpd south of SR 92 (Caltrans, 1999). See Figure II-3 for the locations of major roadways serving the Watershed.

Other roadways serving the area are primarily east-west roads that intersect SR 35 / Skyline Boulevard as their western terminus. These roadways (all two lanes in width, except as indicated) include, from north to south, Sneath Lane, San Bruno Avenue (four lanes), Larkspur Drive, Hillcrest Boulevard, Millbrae Avenue, Trousdale Drive (four lanes), Hayne Road, Black Mountain Road, Crystal Springs Road, Bunker Hill Road, Ralston Road, Cañada Road, and Edgewood Drive.

1.1 RECREATION ACCESS

Existing Public Trails

Existing public trails on the Watershed, available for uses such as hiking, running, rollerblading, bicycling, and horseback riding, are generally located along the eastern edge of the Watershed where they are easily accessible from the adjacent communities. The public trails include the following: Sweeney Ridge Trail, Sawyer Camp Trail, Sheep Camp Trail, San Andreas Trail, Crystal Springs Trail, Ralston Trail, and Edgewood Trail. The Sweeney Ridge Trail is operated and maintained by the Golden Gate National Recreation Area, which holds an easement for the trail. This portion of the trail, which is located between the City of San Bruno and the Portola Gate, is accessed at Sneath Lane, where there is a parking area with capacity for about 20 to 24 vehicles. The six-mile Sawyer Camp Trail traverses the eastern edge of the Peninsula Watershed between San Andreas Lake and Crystal Springs Dam. Access to the trail is provided

near the intersection of SR 35 and Crystal Springs Road (to the south), and near the intersection of Skyline and Hillcrest Boulevards (to the north).

Crystal Springs Golf Club

The Crystal Springs Golf Course is accessed via Golf Course Drive from Skyline Boulevard north of Hayne Road.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

Transportation

Parking. The City has not formally adopted significance standards for parking impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* could have a significant effect if it were to:

- result in a substantially unmet parking demand that leads to hazardous pedestrian and traffic conditions related to vehicles improperly parked on walkways or roadways.

Pedestrian and Bicycle Safety. The City has not formally adopted significance standards for impacts related to pedestrian and bicycle safety, but it generally considers that implementation of the Management Plan could have a significant effect on pedestrian or bicycle safety if it were to:

- result in a substantial hazard to pedestrians or bicyclists; or
- substantially constrain or discourage access to the public areas of the Watershed.

Traffic Circulation

The City has not formally adopted significance standards for traffic circulation impacts, but it generally considers that implementation of the Management Plan would have a significant effect on traffic circulation if it were to:

- cause an increase in traffic that is substantial in relation to existing traffic load and capacity of the street system (as defined by local government plans and policies); or
- interfere with the existing transportation network, causing substantial alterations to circulation patterns or major traffic hazards.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of Management Plan actions on transportation and access, including the following types of actions:

- Watershed Visitor Education Center; and
- Other Management Plan traffic and access impacts.

Watershed Visitor Education Center

Implementation of Action pub4 would establish a Watershed Visitor Education Center. Operation of the center could generate vehicular traffic on roadways that provide access to the center. The size and scope of this potential center is unknown at this time. However, it is expected that the center could attract new visitors to the Watershed. In addition, an increase in SFPUC staff could be required to operate the center. Some people would visit the center as their primary destination, and other visitors to the center would be in the area anyway (e.g., attracted by existing and proposed trails). The latter would not generate additional traffic on area roadways. New vehicular traffic generated by the center is expected to represent a marginal increase in traffic volumes on roadways serving the Watershed, and the effect on traffic flow conditions and pedestrian and bicycle safety conditions would be less than significant.¹ The effect on parking conditions, and the potential for unmet parking demand that leads to hazardous pedestrian and traffic conditions (e.g., people could choose to park improperly on walkways or roadways, forcing pedestrians and vehicles to make potentially dangerous maneuvers), would be contingent on the supply of parking spaces at and near the center, and could be potentially significant.

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. However, the Management Plan does not provide specifications regarding parking demand that would result from operation of additional Watershed facilities (see Table III.J-1). Section IV.J includes a mitigation measure that would reduce parking impacts to a less than significant level.

Other Management Plan Traffic and Access Impacts

The *Peninsula Watershed Management Plan* includes facilities that could increase public visitation of the Watershed by providing increased information regarding public activities available on the Watershed, such as public use maps and brochures, or by providing additional public activity destinations. Increased public use of individual Watershed components would be gradual and limited, and therefore would not substantially increase traffic, result in unmet parking demand that leads to hazardous pedestrian and traffic conditions, or create pedestrian and bicycle hazards. The following discussion reviews the effect of implementation of all management actions and policies that could result in increased public use of the Watershed.

Vehicular traffic associated with the Management Plan's continued policies for the use of existing public trails (primarily along the eastern edge of the Watershed) would be expected to increase in proportion to increases in both local population and demand for recreation opportunities. Implementation of the Management Plan would revoke equestrian use privileges on internal Watershed roads and would grant equestrians the rights of access to designated existing public trails, future additions to the public trail system, and new trails that would be open to the general

¹ It is noted that Watershed Activities Policy 22 states, in part, that proposals for new facilities, structures, roads, trails, projects and leases, or improvements to existing facilities shall be limited to essential public services, and shall not be attractions unto themselves, but incidental to the primary purposes of the Watershed and to its enjoyment and conservation in its natural condition.

**TABLE III.J-1
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS TO
TRAFFIC AND ACCESS THROUGH OPERATION OF A WATERSHED VISITOR EDUCATION CENTER**

Management Actions that Could Result in Potential Physical Effects^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action^{a,b}	Level of Significance if Implemented
Action pub4: Establish a Watershed Visitor Education Center	None	PS, see Section IV.J

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

public. Therefore, equestrian use would shift from internal roads to those areas open to the general public. The overall number of equestrians on the Watershed would be expected to increase in proportion to increases in both local population and demand for recreation opportunities. The effect of changes in traffic volumes associated with implementation of management actions pertaining to traffic flow on roadways serving the Watershed, and the subsequent effect on parking and safety conditions, would be less than significant.

Currently, group access to internal roads and fire roads is restricted to state-chartered groups of limited size. In addition, a permit is required and the group must be led by a docent or Watershed staff. Under the Management Plan, group access to internal roads and trails on the Watershed would be expanded so that individuals could make reservations and be part of a group tour of the Watershed without being a member of a chartered group. This type of group tour could marginally increase the level of vehicular traffic generated by reducing the ridesharing mode of travel often used by charter groups. This type of group tour could also result in a marginal increase in SFPUC docents and/or staff. These increases, however, would be negligible (i.e., within the daily fluctuation of traffic on roadways serving the Watershed) and the overall effect on traffic flow conditions would be less than significant, as would the subsequent effect on parking and safety conditions.

Development of new trails on the eastern edge of the Peninsula Watershed within the Scenic and Recreation Easement would be expected to increase vehicular traffic in proportion to increases in both local population and demand for recreational opportunities. Development of new recreational opportunities could result in a marginal increase in SFPUC staff for patrol and maintenance of new trails. Because these trails would connect to an existing network of trails already used by the public, the effect of changes in traffic volumes on traffic flow on roadways serving the Watershed, and the subsequent effect on parking and safety conditions, would be less than significant.

REFERENCES – Transportation and Access

Except where indicated, references are on file at the San Francisco Planning Department.

California Department of Transportation (Caltrans), *1998 Traffic Volumes on California State Highways*, 1999.

K. UTILITIES AND PUBLIC SERVICES

1.0 SETTING

1.1 SFPUC INFRASTRUCTURE

Water is conveyed from the Hetch Hetchy system across the San Joaquin Valley through a series of aqueducts and tunnels to Alameda County, near the community of Sunol. Some of the Hetch Hetchy water is stored in the San Antonio Reservoir, and the remainder flows through the Irvington Tunnel and the Bay Division Pipelines.

Local runoff from the Calaveras and San Antonio Reservoirs is treated at the Sunol Water Treatment Plant (WTP) and combined with Hetch Hetchy water. This water is then conveyed across San Francisco Bay and distributed to wholesale customers along the way. Part of the water is stored in Peninsula reservoirs where it is blended with local runoff; the remainder is conveyed to wholesale customers along the Peninsula and distributed to San Francisco customers. The water stored in the Peninsula reservoirs is treated at the San Andreas WTP. This water continues on to the City of San Francisco and provides a potable water supply along the way.

Peninsula Watershed System

Water conveyed through the Bay Division Pipelines to the Peninsula is either stored in San Andreas and Crystal Springs Reservoirs and treated at the San Andreas WTP or it continues north along the Peninsula to the City of San Francisco. The Peninsula Watershed system, starting at the Pulgas Tunnel, is described below.

Pilarcitos Reservoir and Conveyance Facilities

The SFPUC owns 23,000 acres of Watershed lands east of Montara Mountain, and San Francisco has water rights to the upper reaches of Pilarcitos Creek. The City utilizes most of this supply to provide water to the Coastside County Water District (CCWD), which serves the Half Moon Bay area, but the City is not obligated to providing a minimum volume to CCWD. The City also has riparian water rights to the lower reaches of Pilarcitos Creek and its tributaries. The Pilarcitos Reservoir provides an emergency gravity-flow supply to San Andreas and Crystal Springs Reservoirs for use at times when pumps may be out of service, such as following an earthquake.

In 1864, the Spring Valley Water Company completed a dam that impounded the waters of the south branch of Pilarcitos Creek and, through a system of flumes and pipes, brought the water 32 miles to Laguna Honda Reservoir in San Francisco to augment supply from local wells and springs. Pilarcitos Reservoir has a catchment area of 3.8 square miles and a capacity of 3,100 ac-ft. In dry weather, the storage in Pilarcitos Reservoir is limited to 1 billion gallons and needs to remain high in order to meet the operational constraints of CCWD and potential emergencies in San Francisco.

During times of surplus runoff, water is diverted by gravity from the north side of Pilarcitos Reservoir through the Pilarcitos Tunnel No. 1 to San Mateo Creek. Here the upper San Mateo Creek waters and the Pilarcitos Reservoir diversions may either be conveyed through Pilarcitos Tunnel No. 2 to San Andreas Reservoir or flow down San Mateo Creek to Crystal Springs Reservoir.

A portion of the water available in Pilarcitos Reservoir is released for CCWD, following conveyance through Stone Dam Reservoir. Stone Dam is a diversion dam built around 1871 and is located two miles downstream of Pilarcitos Dam. It has a catchment area of 2.1 square miles and a storage capacity of 15 ac-ft. Diversions for CCWD are connected to a new CCWD pipeline that conveys water pumped from Upper Crystal Springs Reservoir west to the CCWD's WTP. This new pipeline allows CCWD to obtain water from either the Pilarcitos system, through Stone Dam Reservoir, or from Crystal Springs Reservoir. The new pipeline does not include approximately two miles of old pipeline from the "Half Moon Bay Meter" at Stone Dam Tunnel Number 1. This pipeline will require replacement.

During times of surplus precipitation, the lower Pilarcitos Creek runoff is diverted from the inlet at the reservoir, through Stone Dam Tunnel No. 1 to San Mateo Creek, and to Crystal Springs Reservoir. The system originally had a series of flumes and aqueducts from the outlet of tunnel No. 1 to San Andreas Reservoir, but these facilities have been abandoned.

Crystal Springs Reservoir

The Upper Crystal Springs Reservoir was formed after the construction of the Upper Crystal Springs Dam in 1877. The Upper Dam no longer completely separates the lakes into two water bodies but is used as support for the Highway 92 roadbed with a culvert underneath; the resulting Crystal Springs Reservoir now has unregulated flow between the upper and lower reservoirs.

The newer (1890) Crystal Springs Dam is an arched dam built of interlocking concrete blocks. This dam is designated as a California Historic Civil Engineering Landmark because of the interlocking block design. Skyline Boulevard was later constructed over Crystal Springs Dam. The Crystal Springs Reservoir has a capacity of 69,300 ac-ft (with 8 feet of flashboards), but due to the current condition of the dam, the State Division of Dam Safety requires a maximum storage of 58,400 ac-ft. The catchment area is 22.5 square miles.

San Andreas Reservoir

The San Andreas Reservoir was created on the San Andreas Creek in 1870 following completion of San Andreas Dam. It collects runoff from a Watershed of 4.4 square miles and has a current capacity of 19,000 ac-ft. The San Andreas fault passes under the eastern abutment of the dam, but no significant damage occurred to the dam during either the 1906 or 1989 earthquakes.

Transmission Facilities from the Pulgas Tunnel to the City

The transmission and related facilities located between the Bay Division Pipelines and the City are extensive and are described below by system segments.

Pulgas Tunnel. Toward the westerly end of Pulgas Tunnel, there are three options for the flow of water. These options are: (1) water flows north into the Crystal Springs Bypass Tunnel for direct delivery to customers north of Pulgas Tunnel; (2) water is pumped at Pulgas Pump Station into the 60-million-gallon (mg) capacity Pulgas Balancing Reservoir; (3) if demand north of Pulgas is being met and if the balancing reservoir is full, excess flows spill into Crystal Springs Reservoir.

The Pulgas Balancing Reservoir is used to balance the daily variations in system demands and pressures. When the available supply flowing in Pulgas Tunnel is greater than the demand north of the tunnel, the excess flow is pumped to refill the balancing reservoir. When the available supply flowing in Pulgas Tunnel is less than the demand north of the tunnel, the water flows by gravity from the balancing reservoir into the Crystal Springs Bypass Tunnel to meet that demand. If the demand north of Pulgas is being met and if the balancing reservoir is full, then the excess flows in Pulgas Tunnel spill into Crystal Springs Reservoir. Occasionally, water will be transferred into Crystal Springs to raise the lake level.

Crystal Springs Bypass Tunnel and Pipeline. Water conveyed from Pulgas Tunnel flows by gravity through the Crystal Springs Bypass Tunnel and Pipeline and into the Crystal Springs and Sunset Supply Pipelines. These pipelines convey water directly to SFPUC wholesale customers between Pulgas and the San Mateo–San Francisco county line, as well as to the City Distribution Division for distribution within the City and County of San Francisco.

Crystal Springs Pump Station and the Crystal Springs–San Andreas Pipeline. The Crystal Springs Pump Station and the 60-inch Crystal Springs–San Andreas Pipeline (also known as the “Force Main”) are used to transfer up to 72 mgd from Crystal Springs Reservoir to San Andreas Reservoir. Water from San Andreas Reservoir is treated by the Harry W. Tracy WTP prior to its release into the transmission system.

Delivery to the City. Water from the Harry W. Tracy WTP is delivered to north Peninsula wholesale customers and the City Distribution Division via the San Andreas Pipelines and the Sunset Branch Line. Within San Francisco, it generally flows and/or is pumped into the following terminal reservoirs: Sutro, Merced Manor, Sunset, and University Mound. From these terminal reservoirs, the City Distribution Division distributes water directly to all of its retail customers in the City.

Harry W. Tracy Water Treatment Plant. Water is diverted from two outlets from the San Andreas Reservoir (No. 2 and No. 3) and is pumped to and treated at the Harry W. Tracy WTP. This WTP has a capacity of 144 mgd and is used to supply potable water to upper-elevation customers, from Millbrae to the Sunset Reservoir in the City through the 54-inch San Andreas Pipeline Nos. 2 or 3. However, if the Crystal Springs Bypass Pipeline and/or Pulgas Tunnel is out of service, the Harry W. Tracy WTP can supply water from Polhemus northward (south of Millbrae). On occasion, Harry W. Tracy WTP water has seeped backward and eastward from the Pulgas valve lot. The SFPUC is looking into the feasibility of having the Harry W. Tracy WTP provide water supply to the South Bay.

Additional Treatment Facilities

In addition to the WTP, there are several treatment facilities within the system. Hetch Hetchy water is first treated with lime (calcium hydroxide) at Rock River, which is in Tuolumne County, about 20 miles east of Oakdale. It is next disinfected with sodium hypochlorite at Tesla Portal. At the Alameda siphons, treated Hetch Hetchy water is blended with water from the Sunol WTP as it is conveyed through the Irvington Tunnel. This water is distributed to East and South Bay customers. Fluorosilicic acid is added to a blend of Hetch Hetchy water and Sunol water along the Crystal Springs Bypass Pipeline, and fluoride is added north of the Crystal Springs Bypass. The remaining water is conveyed from the San Andreas WTP to the upper elevations on the Peninsula and to the City distribution storage tanks. Most of the storage tanks are chlorinated again using sodium hypochlorite.

In addition to the treatment facilities described above, SFPUC adds copper sulfate to the primary reservoirs (Crystal Springs and San Andreas) to control the development of algae, which clogs the filters at the filter plants. The copper sulfate is added to the reservoirs on an as-needed basis, usually no more than two times per year, and more typically once a year for each reservoir. Copper sulfate is applied to Peninsula reservoirs only when phytoplankton populations increase to the extent that taste and odor of the water may be affected or operational problems occur. A drastic reduction in the use of copper sulfate in Peninsula reservoirs has occurred in recent years. Copper sulfate was applied to San Andreas Reservoir in June 1999, the first time since 1994 that any Peninsula reservoir received a copper sulfate application.

Description of SFPUC Functions

The SFPUC has five commissioners who are responsible for 13 divisions; these divisions make up the overall management organization for water and wastewater for the City of San Francisco. This section provides a brief overview of the primary SFPUC divisions that are responsible for water quality and water supply.

Water Supply and Treatment Division

The Water Supply and Treatment Division manages the water system downstream from the Alameda East Portal to the San Francisco line. This Division is further divided into the following functional groups: Millbrae Administration, Maintenance Engineering, Operations and Maintenance, Systems Operations, and the Land and Resource Management Section. The Land and Resource Management Section oversees Watershed management on lands within the Bay Area. This section includes Watershed keepers whose duties are patrolling for security problems, performing reservoir water-level readings, and maintaining ongoing relations with the county departments, the California Department of Forestry and Fire Protection, and recreation districts. They are also responsible for specific technical studies, such as hydrological studies, and for overseeing special projects related to land use activities within the Peninsula and Alameda Watersheds. This group coordinates specific tasks with the Water Quality Bureau (parallel to the Water Supply and Treatment Division), such as developing a water quality monitoring program and addressing hazardous materials issues.

Watershed policy and project plans are also developed by the Land and Resource Management Section. Watershed protection, operations, maintenance, restoration, improvement, and enhancement activities are planned, reviewed, and/or approved by this section. Day-to-day execution of these activities is performed by Maintenance Engineering, Operations and Maintenance, and Systems Operations.

Water Quality Bureau

The Water Quality Bureau is also headquartered in Millbrae and is responsible for water quality throughout the entire system, including the Hetch Hetchy Water and Power System. This bureau also operates a water quality laboratory.

Bureau of Commercial Land Management

The Bureau of Commercial Land Management is responsible for commercial land uses on Watershed lands that are performed under leases and permits within the Watersheds and right-of-ways.

Bureau of Utilities Engineering

The Bureau of Utilities Engineering is responsible for designing and constructing major capital improvement projects. This Bureau is staffed with design engineers who conduct or contract for specific engineering, environmental, construction management, and related services to implement components of the SFPUC's major capital improvement plans.

Other Bureaus

Other SFPUC bureaus with which the Land and Resource Management Section coordinates include Systems Planning, Environmental and Compliance Bureau (SPEAC), which combines the former Systems Planning and Regulatory Compliance and the Bureau of Environmental and Regulatory Management. SPEAC is responsible for coordinating SFPUC's environmental contracts, keeping track of legislation, and other environmental management issues.

Hetch Hetchy Project

The Hetch Hetchy Project manages the Sierra Nevada Watersheds, reservoirs, and water conveyance facilities as far west as the Alameda East Portal. The project also manages the power production and transmission facilities from the Sierra Nevada to the Newark Substation. The Hetch Hetchy Project supplies the prearranged flow of water from the Hetch Hetchy system to the SFPUC system at the Alameda East Portal. The flow rate is set by the SFPUC and is limited to the capacity of the three San Joaquin pipelines. Depending on the seasonal demand and the water levels at the primary storage reservoirs, the SFPUC may request changes of flow rate four to five times a year.

Other Divisions

The City Distribution Division is responsible for distribution engineering, construction, and maintenance throughout the City and County of San Francisco. The Customer Service Division

is responsible for customer services and accounts, the water rationing program, and field services. The Finance Bureau is responsible for water rates and budgets and water conservation programs, in addition to long-term water resource management planning. These divisions are headquartered in San Francisco.

1.2 OTHER UTILITIES

Utility Systems

At Hillcrest Street, Trousdale Boulevard, and San Bruno Avenue, SFPUC electrical service lines originate from Pacific Gas and Electric Company (PG&E) transformers. These lines provide electrical services to the Watershed keeper cottages and the Pilarcitos Dam. Telephone service lines are located above ground; they cross the San Andreas Dam and then join the overhead electrical lines west of the San Andreas Dam. This system is a residential service system maintained by the SFPUC. Watershed-keeper cottages have propane tanks for cooking and heating.

Water Supply and Sewerage Systems

The two cottages closest to Hillsborough and Burlingame are connected to their respective municipal water systems. All other Watershed-keeper cottages and SFPUC facilities are supplied by either spring water lines or filtration plant water piped to individual cottages or other SFPUC Watershed facilities as required.

Emergency water facilities for firefighting on the Watershed consist of water hydrants at the cottages and along the Sawyer Camp Trail that connect to 2-inch supply pipes. The reservoir is the major source of firefighting water supply at the Watershed.

No sewer lines are located on the Peninsula Watershed lands owned by SFPUC. The Filoli complex has a septic system and leach field. The eight chemical and/or vault-flush toilets at the Sawyer Camp Trail are currently serviced by the San Mateo County Parks Department. In conjunction with a proposed expansion of Sawyer Camp Trail, the portable toilets would be replaced with permanent vault toilets, according to the proposal prepared by San Mateo County. The two chemical toilets at the Pulgas Water Temple and vault toilets at Pilarcitos Picnic area are regularly serviced by SFPUC crews. All 10 cottages and other SFPUC plumbing facilities on the Watershed collect sewage in holding tanks that are regularly serviced by SFPUC staff.

Pacific Gas & Electric Facilities

The regional PG&E natural-gas and electrical transmission lines for the San Francisco Peninsula are located on the SFPUC Peninsula Watershed along the I-280 corridor. Two 60-Kilovolt (kV) overhead electrical transmission lines linked by a series of transformers run through the Watershed, west of I-280, providing electrical service to the urbanized areas east of I-280 and to SFPUC facilities on the Watershed. One 60-kV overhead electrical transmission line runs

through the Watershed along SR 92 to Half Moon Bay. A 60-kV electrical transmission line that runs from Pacifica to Half Moon Bay intermittently crosses the Peninsula Watershed property.

Two, 30-inch PG&E natural-gas transmission lines run along the I-280 corridor and end in San Francisco. These lines service the entire Peninsula and San Francisco and operate at 335 pounds pressure. Because this line is over 60 pounds pressure, it is classified as a transmission line according to PG&E.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for utilities and public services impacts. Increase in demand for utilities or public services associated with implementation of the *Peninsula Watershed Management Plan* would not in itself be considered a significant physical environmental impact. However, if such demand were to result in the expansion of existing facilities or construction of new facilities, and if construction or operation of these expanded or new facilities were to result in a significant effect on the physical environment, implementation of the Management Plan would be considered to have a significant utilities or public services impact.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of Management Plan actions on utilities and public services. Implementation of individual Management Plan actions would not require expansion or improvement of the Peninsula Watershed system described in Section 1.1, above.

Implementation of some actions could require expansion of existing utilities, water supply, or sewerage systems, or could require an increase in SFPUC staff. However, the system expansions required for individual actions are expected to be minimal, and construction and operation of expansions would not likely result in significant effects on the physical environment.

REFERENCES – Utilities and Public Services

Except where indicated, references are on file at the San Francisco Planning Department.

E. M. Rose and Associates, prepared for San Francisco Water Department, *Technical Memorandum No. 9: Utilities and Infrastructure Review*, 1994.

Montgomery Watson, prepared for San Francisco Water Department, *Technical Memorandum No. 1: San Francisco Water System Facilities and Practices*, 1993.

L. NOISE

1.0 SETTING

1.1 NOISE ENVIRONMENT

The SFPUC Peninsula Watershed is mostly undeveloped and has a quiet noise environment that is typical of rural or suburban environments. The primary sources of noise on the Watershed are roadways adjacent to the Watershed, including:

- I-280, which extends along the eastern Watershed boundary.
- SR 92, which bisects the Watershed between Upper and Lower Crystal Springs Reservoirs.
- Skyline Boulevard, which extends along the southwestern Watershed boundary (south of SR 92); and
- Edgewood Road, which extends through the southernmost portion of the Watershed.

Minor sources of noise within the Watershed include operation of SFPUC water storage and distribution facilities and maintenance activities associated with existing SFPUC facilities, and maintenance activities at the Filoli Estate, a 654-acre private landholding in the southern portion of the Watershed. Noise sources adjacent to the Peninsula Watershed include residential uses to the east and northwest (within the communities of San Bruno, Millbrae, Burlingame, Hillsborough, San Mateo, Belmont, San Carlos, Redwood City, Woodside, and Pacifica) and operations at the Skylawn Memorial Park to the west.

The *San Mateo County General Plan* (1986) includes a Community Noise Map, which indicates that noise levels were projected to exceed 60 dBA (CNEL)¹ by 1995 within 1,000 to 2,000 feet of the I-280 freeway, 500 to 1,000 feet of SR 92, and 250 feet of Skyline Boulevard and Edgewood Road.

1.2 APPLICABLE NOISE REGULATIONS

San Mateo County Noise Ordinance

The *San Mateo County Noise Ordinance* (Chapter 4.88) specifies exterior noise standards for uses located adjacent to residences, schools, hospitals, churches, or public libraries. The ordinance specifies standards for maximum allowable exterior and interior noise levels. These standards, applicable to nontransportation-related noise sources in general, establish the maximum average exterior and interior noise levels to which the specified noise-sensitive land use types may be exposed. These standards also establish the maximum amount of time (in

¹ CNEL, Community Noise Equivalent Level, represents a cumulative measure in decibels (dBA) of community noise during a 24-hour period. It applies weighting factors to account for people's lower tolerance to noise during the evening (7 p.m. to 10 p.m.) and night (10 p.m. to 7 a.m.).

cumulative minutes per hour) that those land use types may be exposed to specified greater-than-average noise levels. The following activities are exempted from ordinance noise standards:

- “Activities conducted on parks, public playgrounds and school grounds provided such parks, playgrounds and school grounds are owned and operated by a public entity.
- Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, 5:00 p.m. and 9:00 a.m. on Saturdays, or at any time on Sundays, Thanksgiving, and Christmas.”

San Mateo County General Plan

The Man-Made Hazards Section of the *San Mateo County General Plan* addresses noise impacts of transportation facilities within the County. This section identifies residential areas of high noise exposure and levels of institutional noise exposure. It indicates that the state establishes an exterior noise exposure of 70 dBA (CNEL) or greater as unacceptable for residential uses. This General Plan section identifies areas with noise exposures in excess of 70 dBA (CNEL), but none are located within the Watershed vicinity. Noise levels at institutional uses (schools, libraries, hospitals, and convalescent homes) within the County are also listed in this section. All but a few of the identified institutional uses were found to be exposed to noise levels between 50 and 60 dBA (Leq), which is considered normally acceptable for institutional noise-sensitive uses. Institutional uses where noise exposure was found to be higher are also identified, but none are located within or near the Peninsula Watershed.

1.3 SENSITIVE RECEPTORS

The Man-Made Hazards Section of the *San Mateo County General Plan* defines noise-sensitive land uses as “land uses most sensitive to noise intrusion, including, but not limited to, residential and the following institutional uses: hospitals, schools and libraries.” Recreational uses are not generally considered to be noise-sensitive. There are no noise-sensitive receptors located within the Peninsula Watershed, with the exception of a few scattered residences (e.g., SFPUC Watershed-keeper cottages). These residential uses are located outside the Watershed boundary adjacent to the eastern and northwestern boundary of the Peninsula Watershed.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not adopted significance standards for noise impacts, but it generally considers that implementation of the Management Plan would have a significant noise impact if it were to:

- substantially increase noise levels at the location of any sensitive receptors over an extended period of time; or
- substantially increase noise levels to a degree that would affect the use and enjoyment of proximate areas or facilities.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential impacts of Management Plan actions on noise resources, including the following type of impact:

- Noise effects.

Noise Effects

The construction and operation noise from individual Management Plan actions or facilities would not result in a significant impact. New facilities, such as the Watershed Visitor Education Center, would likely be located within the Watershed boundary and not in proximity to sensitive land uses outside the boundary, such as residences. Therefore, cumulative construction noise would not result in a significant impact.

The primary source of noise associated with operation of Watershed facilities would be increased vehicle traffic. However, as noted above, Watershed facilities would not be near sensitive land uses, and operation of those facilities would not result in substantial increases in noise levels at any nearby sensitive receptors, nor would the use and enjoyment of nearby areas be adversely affected. Further, individual facilities could be dispersed, and the operational noise associated with those facilities would not be additive. Therefore, operational noise would not result in a significant impact.

No unavoidable significant program-level noise impacts have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific or site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

REFERENCES – Noise

Except where indicated, references are on file at the San Francisco Planning Department.

San Mateo County, Department of Environmental Management, *General Plan for San Mateo County, Man-Made Hazards Background*, 1986. (Available at the San Mateo County Planning Department, San Mateo, California)

San Mateo County, *San Mateo County Noise Ordinance*, Chapter 4.88, Noise Control, 1997. (Available at the San Mateo County Planning Department, San Mateo, California)

M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

1.0 SETTING

1.1 DEFINITIONS

Hazardous materials and hazardous waste are defined by their levels of toxicity, ignitability, corrosivity, and reactivity. When excavated, soils with concentrations of contaminants higher than certain acceptable levels must be handled and disposed as hazardous waste. The *California Code of Regulations*, Title 22, §66261.20-24 contains technical descriptions of characteristics that would cause a soil to be classified as a hazardous waste.

1.2 REGULATORY SETTING

Hazardous Materials and Waste Handling

The California Environmental Protection Agency (Cal-EPA), Department of Toxic Substances Control (DTSC) regulates the generation, transport, treatment, storage, and disposal of hazardous waste. In San Mateo County, remediation of contaminated sites is performed under the oversight of Cal-EPA and with the cooperation of the County Department of Environmental Health and the Regional Water Quality Control Board (RWQCB). At sites where contamination is suspected or known to occur, the project sponsor must perform a site investigation and draw up a remediation plan, if necessary. For typical development projects, actual site remediation is performed either before or during the construction phase of the project.

Site remediation or development may be subject to regulation by other agencies. For example, if dewatering of a hazardous waste site were required during construction, subsequent discharge to the stormwater/sewer collection system could require a permit from the San Mateo County Department of Environmental Health.

Throughout San Mateo County, businesses that use or store hazardous materials must prepare a Hazardous Materials Management Plan for the County. These requirements apply to any leases on Watershed lands. Individual leases also have conditions regarding hazardous materials. For removal of underground storage tanks (USTs), the Department of Environmental Health has regulatory authority. A closure plan for UST removal must be prepared by the applicant and submitted to the county agency. Upon approval of the UST closure plan by that agency, the appropriate fire department would issue a permit for removal.

Worker Safety

Federal and state laws provide occupational safety standards to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (Cal-OSHA) and the federal Occupational Safety and Health Administration (OSHA) are the agencies responsible for assuring worker safety in the workplace. Cal-OSHA assumes primary responsibility for developing and enforcing standards

for safe workplaces and work practices. At sites known to be contaminated, a Site Safety Plan must be prepared to protect workers. The Site Safety Plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site (NIOSH and OSHA, 1985).

1.3 BACKGROUND AND CURRENT SITE CONDITIONS

Watershed Site

The project site generally contains wildlands, but developed uses include a leased property used for a golf course. Operators of the Crystal Springs Golf Club within the Watershed use and store fertilizers and pesticides as well as gasoline for golf cart fuel. The golf course also uses oils and solvents for maintenance of its golf carts. In addition, Watershed-keeper cottages have propane tanks for cooking and heating. The vendor under contract with the SFPUC to supply propane must comply with all applicable regulations.

Over the past two decades, the San Francisco Police Department and the San Mateo County Sheriff's Department have periodically used a site within the abandoned Skyline Quarry to detonate miscellaneous ordnance or suspicious packages found within their respective jurisdictions. The site is approximately 150,000 square feet, and there are four magazine lockers on the northern edge of the site. A 1999 study found two detonation craters and extensive metal fragments throughout the site, some buried at depths of up to 3 feet (Camp Dresser & McKee, 1999). Other debris, such as plastic and metal canisters and pipes, were also found scattered throughout the site.

There are no locations within the Watershed included on the *California Hazardous Waste and Substances Sites List* (Hazardous Materials Data Management Program, 1994).

2.0 IMPACTS

Hazardous materials and hazardous waste, if mishandled, could pose health and safety risks to the public. Potential health and safety impacts typically could stem from interactions of workers or employees with hazardous wastes encountered during project construction.

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for hazardous materials and hazardous waste impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant hazards effect if it were to:

- involve a substantial risk of accidental explosion or release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation);
- expose people to existing sources of potential hazards, including hazardous materials;

- create a public health hazard or potential public health hazard; or
- potentially interfere with an emergency response plan or emergency evacuation plan.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential hazardous materials and hazardous waste impacts of Management Plan actions, including the following type of impact:

- Increase in public access and use
- Construction-related exposure

Increase in Public Access and Use

Operation of facilities included in the Management Plan would result in increased public visitation of the Watershed. Greater human presence and accessibility to remote areas of the Watershed could increase the likelihood of illegal dumping of wastes, including hazardous wastes. However, this potential generally exists in all wildlands and open space preserves and would not be considered a substantial threat to the public or the Watershed. Therefore, potential increases in illegal dumping of wastes would not be a significant impact. In addition, Watershed-keeper patrols and management actions detailed in the Hazardous Materials and Contamination Section of the Management Plan would reduce the potential for illegal dumping.

Continued operation of the Skyline Quarry detonation site could cause a significant risk to people coming to the Watershed, if public use opportunities were provided in this area, in addition to or in place of the Fifield/Cahill Ridge Trail (see Section V.M). Risk could occur both through inadvertent exposure to debris and other detonation waste products and from the actual detonations themselves. There are no management actions proposed that would reduce this potentially significant risk. However, mitigations proposed in Section IV.M would reduce this risk to a less than significant level.

Construction-related Exposure

The Management Plan proposes a number of additional facilities or improvements on the Watershed and would therefore generate construction projects. Many of the projects would be undertaken to ensure and/or improve water quality or resource protection on the Watershed, such as installation of barriers or fences along reservoir edges, dams, and identified high-risk spill potential areas (Actions haz4 and haz8); cleanup and enhancement of the Skyline Quarry (Action haz7); installation of barriers on Upper Crystal Springs Dam (Action haz9); installation of infiltration drainfields and detention basins (Action sto1); installation of long-term sediment retention basins or other permanent measures (Action aqu12); rehabilitation of shoreline areas and stream segments (Actions aqu5 and aqu7); improvements that prevent human and animal waste from impacting Watershed resources (Actions was1 and was5); and installation of wildlife passage structures (Action wil14). Many of the actions listed in the Roads Section of the Management Plan (Actions roa2, roa3, roa4, roa6, roa7, and roa8) would modify or relocate roads or road components in order to reduce potential erosion and Watershed contamination

from automobile by-products. Fire management actions include the installation of hydrants, helispots, and water tanks (Actions fir2 through fir5); roadway and access improvements (Actions fir6 and fir7); and implementation of fuel management projects that include constructing fuel breaks, conducting prescribed burns, and other improvements (Action fir8). Construction projects would be generated through actions that would provide additional public use opportunities, such as information kiosks and a Watershed Visitor Education Center (Actions pub3 and pub4), the southern extension of the Fifield/Cahill Ridge Trail (Action tra2), and other new trails (Policies WA15.2 and WA15.4). In addition, implementation of Action des8 would result in public access improvements at SFPUC facilities and trails.

Construction of the proposed facilities would require the excavation and disturbance of soils that may be contaminated. Historic land uses in some areas may have resulted in the contamination of soil and/or groundwater (ASTM, 1997). These land uses include those that supported USTs or vehicle use, and any such areas could contain leaked petroleum hydrocarbons. In addition, maintenance operations employing pesticides or pesticide loading/staging areas may have contaminated soil. Areas of contamination associated with past land uses could be encountered during construction activities. Dewatering of contaminated groundwater from any trenches and other excavations could expose individuals and the environment to hazardous levels of contaminants. Similarly, body contact with contaminated soil or groundwater could lead to inadvertent exposure to contaminated materials. Furthermore, dust composed of contaminated soil particles could be inhaled. The impact of potential exposure to hazardous materials is considered potentially significant.

Exposure to hazardous materials or wastes could cause various short-term or long-term health effects. Possible health effects could be acute (immediate, or of short-term severity), chronic (long-term, recurring, or resulting from repeated exposure), or both. Acute effects, often resulting from a single exposure, could result in a range of effects from minor to major, such as nausea, vomiting, headache, dizziness, or burns. Chronic exposure could result in systemic damage or damage to organs, such as the lungs, liver, or kidneys. Health effects would be specific to each hazardous substance. For specific hazardous substances, potential health effects of exposure are described in detail in standard references (Budavari, 1989; Sax and Lewis, 1989; Sittig, 1985).

While the Management Plan proposes certain management actions that could bring about physical effects, the Management Plan also includes actions that would reduce these potential effects. Table III.M-1 is provided to link, at a program level, those actions that could result in potential impacts (column 1) with the full range of actions that could be required to reduce the potential impacts (column 2). The table highlights in **bold** text those actions that may be essential to reduce significant impacts of column 1 actions, depending on the specific nature of the management action, such as design, siting, or implementation schedule. These essential actions, as well as the other actions (in non-bold text) that would further reduce potential physical effects, are discussed below. The table also indicates the level of impact significance that would remain if the actions discussed were implemented. Not every bolded action would be necessary to mitigate the effects of the associated potential impact-causing management action.

**TABLE III.M-1
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS
THROUGH CONSTRUCTION-RELATED EXPOSURE TO HAZARDOUS MATERIALS**

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action haz4: Identify key locations for, and install, barriers or fencing to prevent access to reservoir edges and dams.	Action des9 .	PS, see Section IV.M
Action haz7: Develop and implement a cleanup and enhancement plan for Skyline Quarry, including slope stabilization.	Action des9 .	PS, see Section IV.M
Action haz8: Identify high-risk spill potential areas and implement measures, including barricades, to reduce the risk of hazardous spills.	Action des9 .	PS, see Section IV.M
Action haz9: Install barriers on Upper Crystal Springs Dam.	Action des9 .	PS, see Section IV.M
Action sto1: Remediate on-site stormwater collection and drainage systems through infiltration drainfields and trenches, or detention basins.	Action des9 .	PS, see Section IV.M
Action aqu12: Install long-term sediment retention basins or other permanent measures.	Action des9 .	PS, see Section IV.M
Action aqu5: Rehabilitate shoreline areas using structural shoreline protection measures.	Action des9 .	PS, see Section IV.M
Action aqu7: Rehabilitate stream segments.	Action des9 .	PS, see Section IV.M
Action was1: Repair/replace vault, chemical, and composting toilets as necessary.	Action des9 .	PS, see Section IV.M
Action was5: Install restrooms on Army Road.	Action des9 .	PS, see Section IV.M
Action roa2: Relocate necessary high-use roads/road segments in proximity to streams.	Actions roa12 and des9 .	PS, see Section IV.M
Action roa3: Modify the grading and drainage of necessary high-use roads/road segments.	Actions roa12 and des9 .	PS, see Section IV.M

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.M-1 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS
THROUGH CONSTRUCTION-RELATED EXPOSURE TO HAZARDOUS MATERIALS

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
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 des9 .	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 des9 .	PS, see Section IV.M
Action roa7: Maintain fire roads through effective installation of waterbars and paving where needed.	Actions roa12 and des9 .	PS, see Section IV.M
Action roa8: Restrict access on low-use roads by gates or barriers.	Actions roa12 and des9 .	PS, see Section IV.M
Action fir2: Install a total of seven hydrants into water sources.	Action des9 .	PS, see Section IV.M
Action fir3: Install and maintain a total of five helispots.	Action des9 .	PS, see Section IV.M
Action fir4: Install two additional hydrants on adjacent lands.	Action des9 .	PS, see Section IV.M
Action fir5: Install two additional water tanks.	Action des9 .	PS, see Section IV.M
Action fir6: Undertake road improvements to improve access for fire suppression.	Action des9 .	PS, see Section IV.M
Action fir7: Identify and construct road improvements, including turnouts, turnarounds, and safety zones.	Action des9 .	PS, see Section IV.M
Action fir8: Complete the fuel management projects, including fuel load reductions, prescribed burns, fuel breaks, and access improvements.	Action des9 .	PS, see Section IV.M
Action will14: Design and install wildlife passage structures that minimize wildlife losses.	Action des9 .	PS, see Section IV.M
Action pub3: Establish “gateway” information kiosks.	Action des9 .	PS, see Section IV.M

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

TABLE III.M-1 (Continued)
MANAGEMENT ACTIONS THAT COULD RESULT IN SIGNIFICANT PHYSICAL EFFECTS
THROUGH CONSTRUCTION-RELATED EXPOSURE TO HAZARDOUS MATERIALS

Management Actions that Could Result in Potential Physical Effects ^a	Management Actions that Could be Required to Reduce Potential Physical Effects	
	Action ^{a,b}	Level of Significance if Implemented
Action pub4: Establish a Visitor Education Center.	Action des9 .	PS, see Section IV.M
Action tra2: Provide a southern extension of the Fifield/Cahill Ridge Trail.	Action des9 .	PS, see Section IV.M
Policy WA15.2: Consider the addition of new trails in zones of lesser vulnerability and risk where consistent with the goals and policies of the plan.	Actions roa12 and des9 .	PS, see Section IV.M
Policy WA15.4: Support new trail connections that link to adjacent communities and to the trail facilities of other agencies and which help to complete a continuous north-south public trail along the eastern edge of the Watershed.	Actions roa12 and des9 .	PS, see Section IV.M
Action des8: Implement universal access improvements at SFPUC facilities and trails.	Actions roa12 and des9 .	PS, see Section IV.M

^a See accompanying text and Table II-1 for a description of each management action.

^b **Bold** text indicates actions that may be most essential for reducing potential significant impacts.

S = Significant

PS = Potentially Significant

LTS = Less than Significant

For example, a very minor structure such as a kiosk located in an environmentally non-sensitive area may not require any of the bolded actions to avoid a significant effect. Because implementation information, such as locations of specific facilities, is not yet known, the table indicates a program-level maximum number of measures that could possibly be required to avoid significant impacts. Management actions would be reviewed at the time they are proposed for implementation to determine the potential for project-specific impacts and to identify appropriate mitigation measures (see Section II.E.5.0, Mitigation Monitoring and Reporting).

Action **des9** would require that a dust abatement program be implemented as part of all construction projects. In addition, Action **roa12** would require use of best management practices (BMPs) for road location and construction procedures. Implementation of this action, as described above and in Section IV.M, would control fugitive dust and reduce the potential for inhalation of contaminated dust. However, body contact with contaminated soil would remain a potentially significant impact. Section IV.M-1 includes mitigation measures that would reduce construction-related hazardous materials and hazardous waste impacts to a less than significant level. The impacts of day-to-day management activities that implement the Management Plan are analyzed in this EIR and generally would not be subject to further environmental review. No unavoidable significant program-level hazardous materials impacts have been identified in this EIR. However, the San Francisco Planning Department would require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental review at a more detailed project-specific and site-specific level were necessary. Table II-1 identifies the specific management actions that are likely to require such study.

REFERENCES – Other Hazards

Except where indicated, references are on file at the San Francisco Planning Department.

American Society for Testing and Materials (ASTM), E1527-97, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, 1997.

Budavari, Susan, Ed., *The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals*, 11th Edition, Merck & Co., Inc., 1989. (Available at the U.C. Berkeley Public Health Library, University of California, Berkeley, California)

California Code of Regulations, Title 22, Division 4.5, "Environmental Health Standards for the Management of Hazardous Wastes," Chapter 11, Article 3 (Characteristics of Hazardous Waste), Sections 66261.20-24.

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Hazardous Materials Data Management Program, *Hazardous Waste and Substances Sites List* (“Cortese list”), California Environmental Protection Agency, 1994.

National Institute for Occupational Safety and Health, and Occupational Safety and Health Administration (NIOSH/OSHA), *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, 1985. (Available at the U.C. Berkeley Public Health Library, University of California, Berkeley, California)

Office of Planning and Research, *California Environmental Quality Act Statutes and Guidelines*, Appendix G, 1997.

Sax, N.I. and R.J. Lewis, *Dangerous Properties of Industrial Materials*, 7th Edition, Van Nostrand Reinhold, New York, 1989. (Available at the U.C. Berkeley Public Health Library, University of California, Berkeley, California)

Sittig, M., *Handbook of Toxic and Hazardous Chemicals and Carcinogens*, 2nd Edition, Noyes Publications, Park Ridge, New Jersey, 1985. (Available at the U.C. Berkeley Public Health Library, University of California, Berkeley, California)

N. ENERGY

1.0 SETTING

1.1 REGIONAL SETTING

Sources of Energy

Petroleum and natural gas supply most of the power consumed in California. Petroleum provides about 50 percent of the state's energy need, and natural gas provides about 29 percent (CEC, 1994). The remaining 21 percent of the state's energy need is provided by a variety of energy resources, including coal, nuclear, geothermal, and hydropower. The two major uses of energy are as fuel for transportation and electricity.

Energy Plan, Policies, and Regulations

Federal

The National Energy Strategy (NES) was developed by the U.S. Department of Energy in July 1989 (U.S. Department of Energy, 1991/1992). The NES seeks to offer a balanced program of greater energy efficiency, use of alternative fuels, and the environmentally responsible development of all U.S. energy resources. The NES, expressly recognizing the connection between energy sources and air pollution, calls for reducing energy-related emissions to achieve and maintain the National Ambient Air Quality Standards for carbon monoxide and ozone, and for incorporating air quality concerns into policies for energy supply and use. With respect to transportation, the NES seeks to reduce the amount of energy used to move people and goods by improving the overall efficiency of the transportation system itself, through such policies as promoting mass transit and ride sharing, and by establishing higher Corporate Average Fuel Efficiency standards for automobiles.

State

Building energy consumption is regulated in California under the *California Code of Regulations*, Title 24, which is referred to as the Building Standards Administrative Code. The standards related to energy efficiency are contained in Part 6 (within Title 24), which is referred to as the California Energy Code. The efficiency standards apply to new construction of both residential and nonresidential buildings, and regulate energy consumed for heating, cooling, ventilation, water heating, and lighting. The building energy efficiency standards are enforced through the local building permit process.

Transportation-related energy consumption is not subject to specific controls. The California Energy Commission (CEC) calls for the state to aggressively work to increase the efficiency of its transportation system and the vehicles that use it, since these vehicles consume three-fourths of the oil and roughly half of all the energy used in the state, and are the major source of air pollution in California (CEC, 1992). In addition, the federal government has mandated fuel

economy standards for domestic passenger automobiles, including production targets for zero-emission vehicles.

1.2 LOCAL SETTING

Pacific Gas and Electric Company (PG&E) operates and maintains natural-gas and electrical transmission lines in the Peninsula Watershed to serve the San Francisco peninsula. These transmission lines are primarily located along the I-280 corridor. Two, 60-kilovolt (kV) overhead electrical transmission lines, together with a series of transformers, run through the Watershed west of I-280. These facilities provide electrical service to the urbanized areas east of I-280 and to SFPUC facilities within the Watershed. A single 60-kV electrical transmission line runs through the Watershed along SR 92 to Half Moon Bay. In addition, a 60-kV electrical transmission line that runs from Pacifica to Half Moon Bay intermittently crosses the Watershed. These latter electrical transmission lines provide electricity to the Watershed-keeper cottages and Pilarcitos Dam (E.M. Rose and Associates, 1996).

In addition to electricity, Watershed-keeper cottages use propane tanks for cooking and heating. Two, 30-inch PG&E natural-gas transmission lines run along the I-280 corridor and end in San Francisco. These lines service the entire Peninsula and the City of San Francisco (E.M. Rose and Associates, 1996).

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for energy impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant effect on energy if it were to:

- encourage activities that resulted in the use of large amounts of fuel or energy;
- use energy resources in a wasteful manner; or
- have a substantial effect on the potential use, extraction, or depletion of a natural energy resource.

2.2 PROGRAM-LEVEL IMPACTS

This section discusses the potential energy impacts of implementation of the Management Plan management actions.

Energy Effects

Construction and operation of new facilities or new or modified activities under the Management Plan would not consume substantial amounts of finite natural resources or require significant upgrade to PG&E facilities on the Watershed. Energy consumption for construction of new

facilities would be a one-time impact and would not be an ongoing drain on finite energy resources. Construction energy consumption would primarily be in the form of fuel and would not significantly effect PG&E or Hetch Hetchy Water and Power energy resources. Operation of Management Plan facilities would increase the overall amount of energy consumed in the Watershed, including electricity to operate new Watershed facilities and fuel associated with increased vehicular trips to the Watershed for recreation, education, and employment purposes. However, these increases would not be substantial, and the energy resources effect of Management Plan implementation would not be significant.

REFERENCES – Energy

Except where indicated, references are on file at the San Francisco Planning Department.

California Energy Commission (CEC), *The 1992-1993 California Energy Plan*, 1992.

California Energy Commission (CEC), *Energy and the Economy*, 1994.

E.M. Rose and Associates, prepared for San Francisco Water Department, *Technical Memorandum No 9: Utilities and Infrastructure Review*, Appendix C-10 of the *Peninsula Watershed Management Plan*, 1996.

U.S. Department of Energy, *National Energy Strategy, Executive Summary, First Edition*, 1991/1992.

O. GROWTH INDUCEMENT

Section 15126.2 (d) of the CEQA Guidelines requires agencies to address potential growth-inducing effects of their actions. Growth-inducing effects are defined as those effects that could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth-inducing effects could result from projects that would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in population could tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. The Guidelines also require analysis of the characteristics of projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

The primary purpose of the *Peninsula Watershed Management Plan* is to maintain and improve source water quality to protect public health and safety and to provide maximum practicable water supply and reliability. An important component of this purpose is to protect the natural resources of the Watershed. This purpose and the goals, policies, and management actions of the Management Plan have no potential to foster economic or population growth, or the construction of additional housing, either directly or indirectly. No facilities are proposed under the Management Plan that would increase the City's diversion of water from the Watershed. Any increase in yield as a result of implementation of the Management Plan would be so slight as to not be significant and would not create any growth-inducing impacts.

P. CUMULATIVE ANALYSIS

A cumulative environmental effect is the result of two or more projects or actions (or policies) that overlap in time or space, or that affect the same sensitive receptor. The purpose of this cumulative analysis is to determine whether potentially significant cumulative environmental impacts would occur from implementation of the *Peninsula Watershed Management Plan* in combination with other projects or conditions, and to indicate the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. The discussion of cumulative impacts should include:

- (1) Either: (A), a list of past, present, and probable future projects producing related or cumulative impacts; or (B), a summary of projections contained in an adopted general plan or similar document, or in an adopted or certified environmental document, which described or evaluated conditions contributing to a cumulative impact;
- (2) A discussion of the geographic scope of the area affected by the cumulative effect;
- (3) A summary of expected environmental effects to be produced by these projects; and
- (4) Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

1.0 GEOGRAPHIC SCOPE

The geographic area for evaluating the potential for cumulative environmental impacts relating to the Management Plan encompasses the entire hydrologic watershed and the adjacent developed and open space.

2.0 CUMULATIVE PROJECTS

This cumulative analysis is based on a list of projects that are current and reasonably foreseeable and that could have cumulative effects in combination with implementation of the Management Plan. However, for some of these projects, little specific design or schedule data are known. The cumulative projects are described below.

2.1 SFPUC PROJECTS

The SFPUC is in the process of preparing a Water Supply Master Plan for the entire SFPUC water system. This plan will look at the water supply and storage issues in the Peninsula Watershed in greater detail. In addition, the SFPUC is undertaking the following projects in the Watershed that fall generally within the category of upgrade and maintenance. These projects are either underway or planned for the near future:

- 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 of new adit structures, which are vertical pipe and valve enclosures that allow access for maintenance staff.
 - Stone Dam Rehabilitation: includes minor worker safety improvements.
 - Additional Pipeline Improvements/Upgrades/Replacements.
 - Crystal Springs Balancing Reservoir and Pulgas Pump Station: repairs and minor upgrades to existing facilities.
 - Watershed Cottage Maintenance and Renovation.
- Crystal Springs Pump Station and Pipeline: Includes improvements to the water emergency release valves at the pump station and increasing pipe size and/or installation of additional pipeline.
- Lower Crystal Springs Dam Abutment Project: Upgrades to dam to comply with Bureau of Dam Safety requirements, including replacement of flashboards to restore pre-1980 water storage levels in Crystal Springs Reservoir.
- Automation of Operations: Includes upgrade of facilities and/or installation of devices for automation of gates, pipes, valves, etc.
- Hetch Hetchy Water Treatment Project – Chloramine Conversion: This conversion project provides for implementing chloramination of the Hetch Hetchy system to allow this water source to meet state and federal drinking water standards. The project involves construction of facilities for establishing disinfection and treatment facilities throughout the SFPUC water supply system. Within the Peninsula Watershed, the following potential facilities are proposed: a new dechlorination facility and pipeline at the Pulgas Water Temple and reservoir upgrade and construction of a chlorine boosting station at the Pulgas Balancing Reservoir. The impacts of any of these facilities would primarily stem from construction activities and storage of hazardous materials. An EIR is being prepared to evaluate the environmental effects of this project.
- Pulgas Interim Dechlorination Facility Project: Construction of a small water treatment plant to dechlorinate water released into Upper Crystal Springs Reservoir to comply with Federal and State water quality standards.
- CCWD Half Moon Bay Meter Pipeline Replacement: This project addresses approximately two miles of the CCWD pipeline, which conveys water to CCWD from Pilarcitos Reservoir (see Section III.K.1.1).

2.2 NON-SFPUC PROJECTS

In addition, other agencies or private entities have proposed projects in the immediate vicinity of the Watershed.

- Caltrans Highway 92 Widening Project: Widening of the highway from the Upper Crystal Springs Dam westward to Skyline Boulevard, and include an uphill passing lane and road alignment.
- San Mateo County Skyline Boulevard Bridge Replacement: Replacement of the existing road over the bridge.
- San Mateo County Recreation Trails: San Mateo County has developed a countywide *Trails Plan* (1995) that presents potential connector trails to the three Bay Area region-wide trail systems: the Bay Trail (circles the Bay's shoreline), Bay Area Ridge Trail, and Coastal Trail (runs along the Pacific Ocean shoreline). The *Trails Plan* proposes connector trails between points on the trail systems and other County trails in County parks, open space preserves, public lands, and private lands, including the Peninsula Watershed. A Draft EIR for the Trails Plan was released in October 1999. Specific alignments are not proposed, nor have any agreements been established with other agencies, such as for right-of-ways on SFPUC-owned Watershed lands. In addition to these potential trails, other planned trail projects include the Crystal Springs Spur Trail and San Francisco Watershed Spur Trail (Junipero Serra County Park to the Watershed) and the ongoing Crystal Springs Trail North connecting Sawyer Camp Trail with Crystal Springs Trail South.
- Skylawn Cemetery Mortuary/Chapel Building Project: Skylawn Cemetery has proposed to build a new mortuary/chapel building with an adjacent parking area near existing buildings. The proposed facility would be adjacent to the Watershed, in the vicinity of the SR 92 / Skyline Boulevard intersection.

3.0 CUMULATIVE IMPACTS

Because many of the projects considered in Section 2.0 are not fully developed or designed, it is difficult to completely assess the expected environmental effects that these projects would produce. However, there are two general categories of effects that could be expected. The first and most widespread would be general construction impacts, such as temporary air quality degradation and increased erosion resulting from earth movement. The second category of impacts is related to potential habitat alterations and effects on wildlife resulting from construction projects, such as the Lower Crystal Springs Reservoir Dam Abutment Project, which would bring the dam up to state safety standards and consequently allow the SFPUC to resume higher, pre-1980 storage levels.

Implementation of the *Peninsula Watershed Management Plan*, in conjunction with the above-listed projects and ongoing regular Watershed maintenance activities, would adversely affect special-status species within the Watershed. However, the affect of other management actions and the mitigations described in Section IV.E would reduce any impacts to a less than significant level. Thus, Management Plan actions would not contribute to significant cumulative effects. The proposed trail on the Fifield/Cahill Ridge service road could result in impacts to natural resources. These impacts are discussed in detail in Section V.E, Natural Resources. Actions and mitigation measures described in Sections III.E, IV.E, V.E, and VI.E would reduce these impacts to a less than significant level. Environmental review for the proposed projects described in Section 2.0, above would assess cumulative impacts as well as project impacts.

CHAPTER IV

PROGRAM-LEVEL MITIGATION MEASURES

- This chapter proposes mitigation measures for the potentially significant environmental impacts discussed in Chapter III. There are no mitigation measures proposed as part of the project. Mitigation measures identified in this report are designed to ensure that all applicable Management Plan management actions are implemented to reduce the impact of implementation of other management actions. Additional mitigation measures identified in this report are proposed for two categories of impacts:
 - Impacts for which the Management Plan does not include management actions that would reduce the impacts.
 - Impacts for which the Management Plan does include management actions that would reduce the impacts, but not to a less than significant level.

This chapter includes mitigation measures requiring that the impact-reducing actions discussed in Chapter III be adopted and implemented along with the actions that could result in significant impacts. If the impact-reducing actions were not adopted (i.e., due to funding), the SFPUC would need to adopt findings of overriding considerations prior to implementing those actions that could result in significant impacts unless more project-specific subsequent analysis demonstrated that a significant impact would not occur.

A. EXISTING PLANS AND POLICIES

No potentially significant or significant impacts have been identified, and no mitigation is required.

B. LAND USE

No potentially significant or significant impacts have been identified, and no mitigation is required.

C. GEOLOGY AND SOILS

● 1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. In implementing any Management Plan management action that could result in significant physical effects through increased soil erosion, as shown in Table III.C-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.C-2).

2. In implementing any Management Plan management action that could result in significant physical effects to geology and soils through reduced slope stability, as shown in Table III.C-3, ensure all applicable Management Plan management actions are implemented that are necessary to reduce the impact to a less than significant levels (see Table III.C-3).

D. HYDROLOGY AND WATER QUALITY

1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. In implementing any Management Plan management action that could result in significant physical effects to water quality through increased public access and use, as shown in Table III.D-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.D-2).
2. In implementing any Management Plan management action that could result in significant physical effects to water quality through the development of new facilities, as shown in Table III.D-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.D-3).
3. In implementing any Management Plan management action that could result in significant physical effects to water quality due to Watershed operations and maintenance activities, as shown in Table III.D-4, 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.D-4).
4. In implementing any Management Plan management action that could result in significant physical effects to hydrology through the build-up of sediments, as shown in Table III.D-5, 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.D-5).

E. NATURAL RESOURCES

1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. In implementing any Management Plan management action that could result in significant physical effects to natural resources from the removal of non-native forests, as shown in Table III.E-4, 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.E-4).
2. In implementing any Management Plan management action that could result in significant physical effects to natural resources from construction activities, as shown in Table III.E-5, 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.E-5).
3. In implementing any Management Plan management action that could result in significant physical effects to natural resources from an increase in public access and use, as shown in

Table III.E-6, 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.E-6).

F. AIR QUALITY

● 1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. In implementing any Management Plan management action that could result in significant physical effects to air quality through 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).

G. FIRE MANAGEMENT

● 1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. In implementing any Management Plan management action that could result in significant physical effects to fire management due to road closures and alterations, 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).
2. In implementing any Management Plan management action that could result in significant physical effects to fire management due to fire hazards 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).
3. In implementing any Management Plan management action that could result in significant physical effects to fire management through 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).

H. CULTURAL RESOURCES

● 1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. In implementing any Management Plan management action that could result in significant physical effects to cultural resources due to 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).
2. In implementing any Management Plan management action that could result in significant physical effects to cultural resources due to 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 (see Table III.H-3). However,

impacts to historic resources would remain potentially significant, unless the mitigation measures listed below are adopted.

The following mitigation measures address potential significant physical effects to historic resources due to construction activities.

- 3. Any alteration of identified historic resources must be in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- 4. Demolition or removal of historic structures shall be prohibited.
- These mitigation measures would reduce cultural resource impacts resulting from implementation of the Management Plan to a less than significant level.

I. AESTHETICS

● 1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. In implementing any Management Plan management action that could result in significant physical effects to 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).
2. In implementing any Management Plan management action that could result in significant physical effects to aesthetic resources 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).
3. In implementing any Management Plan management action that could result in significant physical effects to aesthetic resources 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).

J. TRANSPORTATION AND ACCESS

● 1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

The following measure addresses potential hazardous conditions related to lack of parking at the proposed Watershed Visitor Education Center.

1. As part of the design of the Watershed Visitor Education Center, include a parking plan developed in coordination with San Mateo County to provide sufficient parking spaces to avoid unacceptable vehicle/pedestrian hazards. The parking demand would be estimated during project-level environmental review of the proposed center. In addition, the SFPUC would monitor the area surrounding new public facilities and report illegal parking to the San Mateo County Sheriff's Department for enforcement.

Implementation of this measure would reduce potential impacts to a less than significant levels.

K. UTILITIES AND PUBLIC SERVICES

No potentially significant or significant impacts have been identified, and no mitigation is required.

L. NOISE

No potentially significant or significant impacts have been identified, and no mitigation is required.

M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

● 1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

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 management actions are implemented that are necessary to reduce the impact (see Table III.M-1). However, additional mitigation would be necessary to avoid potentially significant effects (see Section IV.M.2.0, below).

- These measures address construction-related hazardous materials and hazardous waste impacts:

- 2. 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 San Mateo 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 San Mateo County Department of Environmental Health or the jurisdiction state or federal agency as to whether site mitigation plan is needed.

3. Remediate any contamination found in the Watershed sufficiently to protect human health and the environment. In addition, prohibit use of Skyline Quarry (or any other Watershed location) as a detonation site. The current site will be restored based on recommendations found in the Camp Dresser & McKee *Draft Environmental Evaluation of the Skyline Quarry Ordnance and Detonation Site* (1999).

Implementation of these measures would reduce potential impacts to a less than significant level.

N. ENERGY

No potentially significant or significant impacts have been identified, and no mitigation is required.

O. GROWTH INDUCEMENT

No potentially significant or significant impacts have been identified, and no mitigation is required.

CHAPTER V

FIFIELD/CAHILL RIDGE TRAIL PROJECT DESCRIPTION, ENVIRONMENTAL SETTING, AND IMPACTS

PROJECT DESCRIPTION

Public access to the Peninsula Watershed is provided via recreational trails along the eastern periphery. The interior of the Watershed has long been closed to the public to protect water quality and the drinking water supply for the San Francisco Public Utilities Commission's (SFPUC's) 2.4 million water customers. However, the SFPUC does allow access to groups with a permit and a guide to hike along the internal roads of the Watershed. Access by permit has also been granted for scientific study and equestrian use.

The Bay Area Ridge Trail Council (BARTC) has proposed a multiuse (hiking, bicycling, and equestrian) trail that extends along the ridges surrounding San Francisco Bay and has designated, on its trail maps, a route through the Peninsula Watershed. This route would extend south from Golden Gate National Recreational Area's (GGNRA's) Sweeney Ridge, an existing public trail, through the Watershed along the existing Fifield/Cahill Ridge service road to the intersection of SR 92 and Skyline Boulevard (or alternatively to Skyline Quarry). The BARTC route then extends south along Skyline Boulevard, exits SFPUC property, and continues to Kings Mountain.

In January 1995, the SFPUC identified a preferred alternative (analyzed as the Management Plan in this EIR) upon which Watershed Management Policies and Plans would be prepared. The preferred alternative was based upon studies of the watersheds, their resources, and the sensitivity and vulnerability of these resources. The trails component of the preferred alternative prohibited unrestricted public access to internal roads and trails, but allowed docent-led access to internal trails with a permit. In addition, north-south public access along the eastern periphery of the Watershed was continued along the Sawyer Camp trail but would be enhanced with connecting trails. At the same time, the SFPUC stated its policy with respect to the financial burden of providing recreational activities — that such activities would not be borne by the water ratepayers.

While the Management Plan was being developed, numerous inquiries, requests, and concerns were raised with respect to trails on the Peninsula Watershed. On March 4, 1997, the SFPUC reaffirmed its original position, which was to prohibit unsupervised public access into the interior areas of the watersheds (SFPUC resolution no. 97-0070). Subsequently, on April 21, 1997, the San Francisco Board of Supervisors, based upon requests from the BARTC, recommended that the SFPUC reconsider the Bay Area Ridge Trail route through the interior of

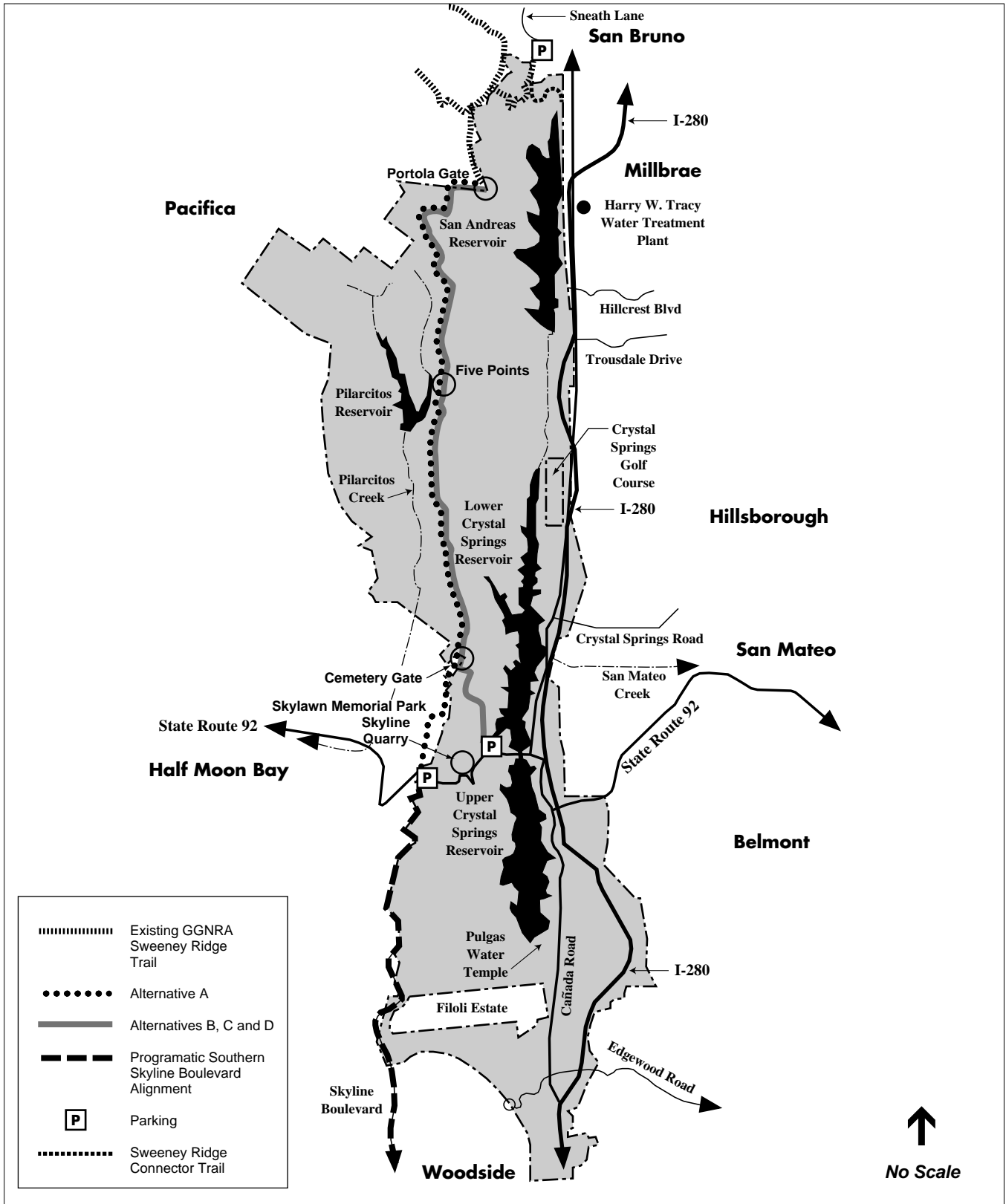
the Watershed (San Francisco Board of Supervisors resolution no. 191-97-001). The SFPUC, on June 10, 1997 (SFPUC resolution no. 97-0177) amended the preferred alternative to consider public access to the Fifield/Cahill Ridge service road.

Existing public trails on the Peninsula Watershed are described in Section III.B, Land Use. In addition, proposed connector trails to these public trails are described in that section. This section will specifically discuss the proposed Fifield/Cahill Ridge Trail, which would extend from the Portola Gate (at the northern end of the Peninsula Watershed) to SR 92. As described in Chapter II, Project Description, this EIR generally addresses impacts at a programmatic level. However, this section of the EIR addresses impacts of the proposed Fifield/Cahill Ridge Trail at a project-level. This exception was requested by the SFPUC to provide detailed analysis and mitigation so that specific decisions regarding this project can be made as quickly as possible. The *Peninsula Watershed Management Plan* includes four alternatives (that differ in both operation and alignment) for the Fifield/Cahill Ridge alignment for the Bay Area Ridge Trail (see Figure V-1). These alternatives, analyzed in this EIR at an equal level of detail, are described below and summarized in Table V-1. Table V-2 summarizes the potential impacts of the alternatives by resource area and indicates the level of impact significance following implementation of mitigation measures. Some new facilities would be required for this project, as described below. With the exception of a short connector trail to the Sweeney Ridge (this trail alignment has not been defined and is not analyzed at a project level in this document), no new trail design or construction would be required for any of these trail alternatives. However, trail alternatives A and B would require some accessibility improvements. These improvements could be minimal (installing new signage) or substantial (providing a similar experience on a new, accessible spur trail, and/or regrading segments of the existing road to reduce slope cross-slope and to provide a firm and stable surface).

The analysis in this chapter includes setting information specific to the proposed Fifield/Cahill Ridge Trail and also references more general setting information provided in Chapter III.

FIFIELD/CAHILL RIDGE TRAIL ALTERNATIVES

Four alternatives have been developed for the proposed Fifield/Cahill Ridge Trail. These alternatives were developed to meet the objective of SFPUC resolution no. 97-0177, which was to consider public access along the Fifield/Cahill Ridge, as a segment of the Bay Area Ridge Trail. Trail Alternatives A and B were proposed by the BARTC. All four alternatives meet the objective of resolution no. 97-0177, and together they bracket a wide range of access policy alternatives. All four alternatives share the same alignment for most of the proposed trail. As shown on Figure V-1, at Cemetery Gate, Alternative A branches slightly to the west, and Alternatives B, C, and D branch slightly to the east and proceed south into the old quarry. The alternatives vary in terms of operation and restrictions, as more fully described below. Alternatives A and B are similar in that both provide for unrestricted public access along the Fifield/Cahill Ridge Trail. Alternatives B, C, and D share the same alignment, but differ primarily in terms of access restrictions.



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

Peninsula Watershed Management Plan EIR / 930385 ■

Figure V-1
Alternative Fifield/Cahill Ridge
Trail Alignments

**TABLE V-1
SUMMARY OF FIFIELD/CAHILL RIDGE TRAIL ALTERNATIVES**

	Alternative A: Unrestricted Access to SR 92 / Skyline Boulevard	Alternative B: Unrestricted Access to Skyline Quarry	Alternative C: Access by Annual Permit (to Skyline Quarry) (Hiking Only)	Alternative D: Docent-led Access (to Skyline Quarry) (Hiking Only)
Description	Unrestricted public access for hikers, equestrians, and bicyclists between the Portola Gate and the SR 92 / Skyline Boulevard intersection; access through Skylawn Cemetery.	Unrestricted public access for hikers, equestrians, and bicyclists between the Portola Gate and Skyline Quarry.	Pedestrian access by purchase of an annual permit; access between the Portola Gate and Skyline Quarry. Includes a Sweeney Ridge connector trail.	Docent-led access for hikers on scheduled days and times; access between the Portola Gate and Skyline Quarry. Includes a Sweeney Ridge connector trail.
Hours of Operation	Seven days a week, from 8 a.m. to dusk, all year long. Closed during operating hours only if needed (operations and maintenance, fire danger, other emergencies.)	Seven days a week, from 8 a.m. to dusk, all year long. Closed during operating hours only if needed (operations and maintenance, fire danger, other emergencies.)	Seven days a week, from 8 a.m. to dusk, all year long. Closed during operating hours only if needed (operations and maintenance, fire danger, other emergencies.)	Seven days a week, from 8 a.m. to dusk, all year long. Closed during operating hours only if needed (operations and maintenance, fire danger, other emergencies.)
Usage	Hikers would have independent access during operating hours, on a permanent basis. Bicyclists and equestrians would have independent access during operating hours subject to annual review. No limits to number of users per day.	Hikers would have independent access during operating hours, on a permanent basis. Bicyclists and equestrians would have independent access during operating hours subject to annual review. No limits to number of users per day.	Only hikers with an annual permit would be allowed access. Number of users per day to be limited. Bikers and equestrians would be routed to trails on eastern edge of Watershed via the Sweeney Ridge connector trail.	Hikers would reserve space in scheduled docent-led groups of no larger than 25 people. Three groups per day would be allowed, with a maximum of 75 people per day. Bikers and equestrians would be rerouted to trails on eastern edge of Watershed via the Sweeney Ridge connector trail.
Permit and Reservation System	None.	None.	Permits would be issued to individuals who apply, and would be valid for one year.	Reservations would be accepted through both telephone and internet reservation systems.
Fees	No access fees.	No access fees.	To be determined by SFPUC.	To be determined by SFPUC.

TABLE V-1 (Continued)
SUMMARY OF FIFIELD/CAHILL RIDGE TRAIL ALTERNATIVES

	Alternative A: Unrestricted Access to SR 92 / Skyline Boulevard	Alternative B: Unrestricted Access to Skyline Quarry	Alternative C: Access by Annual Permit (to Skyline Quarry) (Hiking Only)	Alternative D: Docent-led Access (to Skyline Quarry) (Hiking Only)
Parking/Access	Primary parking would be on the unimproved Caltrans property on the north side of the SR 92 / Skyline Boulevard intersection. Secondary access and a trailhead would be located at Portola Gate, with parking at Sneath Lane.	Primary parking would be at Skyline Quarry. Secondary access and a trailhead would be located at Portola Gate, with parking at Sneath Lane.	Primary parking would be at Skyline Quarry and at Sneath Lane. An electronic gate would be installed at Skyline Quarry and a turnstile would be installed at the Skyline Quarry and Portola Gate trailheads.	Primary parking would be at Skyline Quarry and at Sneath Lane. There would be one tour daily leaving from Skyline Quarry, Portola Gate, and Cemetery Gate, and leaving from other locations by special arrangement.
Restroom Facilities	Five permanent restrooms would be located along the trail.	Five permanent restrooms would be located along the trail.	Five permanent restrooms would be located along the trail.	Five permanent restrooms would be located along the trail.
Support Facilities	Three water fountains, three public telephones, and three water troughs for horses.	Three water fountains, three public telephones, and three water troughs for horses.	Three water fountains and three public telephones.	Three water fountains and three public telephones.
Docent System	Available.	Available.	Available.	Required and available through reservation only.
Patrols/Enforcement	Professional vehicular ranger patrols, as well as off-trail ranger patrols. In addition, consider the use of volunteer bike and equestrian patrols.	Professional vehicular ranger patrols, as well as off-trail ranger patrols. In addition, consider the use of volunteer bike and equestrian patrols.	Professional vehicular ranger patrols, as well as off-trail ranger patrols. In addition, consider the use of equestrian patrols.	Professional vehicular ranger patrols, as well as off-trail ranger patrols. In addition, volunteer equestrian patrols would be used.
Fire Protection	Fire protection activities commensurate with those recommended in the Fire Management Element to take place prior to opening trail.	Fire protection activities commensurate with those recommended in the Fire Management Element to take place prior to opening trail.	Fire protection activities commensurate with those recommended in the Fire Management Element to take place prior to opening trail.	Not Applicable.

TABLE V-1 (Continued)
SUMMARY OF FIFIELD/CAHILL RIDGE TRAIL ALTERNATIVES

	Alternative A: Unrestricted Access to SR 92 / Skyline Boulevard	Alternative B: Unrestricted Access to Skyline Quarry	Alternative C: Access by Annual Permit (to Skyline Quarry) (Hiking Only)	Alternative D: Docent-led Access (to Skyline Quarry) (Hiking Only)
Management Responsibility	SFPUC; other agencies may contribute resources as requested.	SFPUC; other agencies may contribute resources as requested.	SFPUC; other agencies may contribute resources as requested.	SFPUC; other agencies may contribute resources as requested.
Water Quality and Ecological Resource Monitoring	Extensive water quality and ecological resource monitoring would be required.	Extensive water quality and ecological resource monitoring would be required.	Moderate water quality and ecological resource monitoring would be required.	No additional water quality and ecological resource monitoring would be required.
Fines	Any individuals performing activities prohibited on the Watershed would be cited and fined.	Any individuals performing activities prohibited on the Watershed would be cited and fined.	Any individuals performing activities prohibited on the Watershed would be cited and fined.	Any individuals performing activities prohibited on the Watershed would be cited and fined.
Management Plan Compatibility	All trail activities must be compatible with the policies and management actions of the Management Plan.	All trail activities must be compatible with the policies and management actions of the Management Plan.	All trail activities must be compatible with the policies and management actions of the Management Plan.	All trail activities must be compatible with the policies and management actions of the Management Plan.
Improvements Required	<ul style="list-style-type: none"> ▪ Construction for parking lot at SR 92 / Skyline Boulevard. ▪ Expansion of parking lot at Sneath Lane. ▪ Five permanent toilets. ▪ Three drinking fountains. ▪ Three phones. ▪ Three horse water troughs. ▪ Informational, directional, and regulatory signage. 	<ul style="list-style-type: none"> ▪ Construction of parking lot at Skyline Quarry. ▪ Expansion of parking lot at Sneath Lane. ▪ Five permanent toilets. ▪ Three drinking fountains. ▪ Three phones. ▪ Three horse water troughs. ▪ Informational, directional, and regulatory signage. 	<ul style="list-style-type: none"> ▪ Construction of parking lot at Skyline Quarry. ▪ Five permanent toilets. ▪ Three drinking fountains. ▪ Three phones. ▪ Installation and maintenance of an electronic card-activated gate system. ▪ Telephone and internet reservation system, implementation, and ongoing staffing. 	<ul style="list-style-type: none"> ▪ Construction of parking lot at Skyline Quarry. ▪ Five permanent toilets. ▪ Three drinking fountains. ▪ Three phones. ▪ Telephone and internet reservation system, implementation, and ongoing staffing. ▪ Directional, informational, and regulatory signage.

TABLE V-1 (Continued)
SUMMARY OF FIFIELD/CAHILL RIDGE TRAIL ALTERNATIVES

	Alternative A: Unrestricted Access to SR 92 / Skyline Boulevard	Alternative B: Unrestricted Access to Skyline Quarry	Alternative C: Access by Annual Permit (to Skyline Quarry) (Hiking Only)	Alternative D: Docent-led Access (to Skyline Quarry) (Hiking Only)
Improvements Required (cont.)	<ul style="list-style-type: none"> ▪ Access barriers to intersecting trails/roads accessible on foot, or by bike or horse. ▪ Ecological resource protection barriers for sensitive resources (fences, hay bales). ▪ Ecological and water quality monitoring stations. ▪ Fire management activities to reduce hazards prior to opening the trail. ▪ Additional fire equipment to conduct ongoing management and response. ▪ Americans with Disabilities Act improvements, as required. ▪ Monitoring staff and equipment. 	<ul style="list-style-type: none"> ▪ Access barriers to intersecting trails/roads accessible on foot, or by bike or horse. ▪ Ecological resource protection barriers for sensitive resources (fences, hay bales). ▪ Ecological and water quality monitoring stations. ▪ Fire management activities to reduce hazards prior to opening the trail. ▪ Additional fire equipment to conduct ongoing management and response. ▪ Americans with Disabilities Act improvements, as required. ▪ Monitoring staff and equipment. 	<ul style="list-style-type: none"> ▪ Access barriers to intersecting trails/roads accessible on foot, or by bike or horse. ▪ Ecological resource protection barriers for sensitive resources (fences, hay bales). ▪ Ecological and water quality monitoring stations. ▪ Fire management activities to reduce hazards prior to opening the trail. ▪ Professional, docent, and volunteer patrol training. ▪ ADA improvements, as required. ▪ Monitoring staff and equipment. 	<ul style="list-style-type: none"> ▪ Professional, docent, and volunteer patrol training. ▪ Fire equipment.
Other	<ul style="list-style-type: none"> ▪ Trail easement needed through Skylawn Cemetery. 			

**TABLE V-2
POTENTIAL IMPACTS OF TRAIL PLAN ALTERNATIVES BY RESOURCE AREA**

	Plans and Policies	Land Use	Geology and Soils	Hydrology and Water Quality	Natural Resources	Air Quality	Fire Management	Cultural Resources	Aesthetics	Transportation	Utilities and Public Services	Noise	Haz. Materials Haz. Waste	Energy
Alternative A:														
Impacts	N	U	U	U	U, I, C, O	C	U, C	U, C	U	O	N	O	C	N
Significance after Mitigation	NR	LTS	LTS	LTS	LTS	NR	LTS	NR	NR	LTS	NR	LTS	LTS	NR
Alternative B:														
Impacts	N	U	U	U	U, I, C, O	C	U	U, C	U	O	N	N	C	N
Significance after Mitigation	NR	LTS	LTS	LTS	LTS	NR	LTS	NR	NR	LTS	NR	NR	LTS	NR
Alternative C:														
Impacts	N	U	U	N	U, I, C, O	C	U	U, C	U	O	N	N	C	N
Significance after Mitigation	NR	NR	LTS	NR	LTS	NR	LTS	NR	NR	LTS	NR	NR	LTS	NR
Alternative D:														
Impacts	N	N	N	N	I, C, O	C	U	C	N	O	N	N	C	N
Significance after Mitigation	NR	NR	LTS	NR	LTS	NR	LTS	NR	NR	LTS	NR	NR	LTS	NR

Impact Type:

N = No Impacts / Not Significant
 U = Unauthorized use of Watershed lands leading to significant impacts
 I = Increased use leading to significant impacts
 C = Mitigable construction impacts
 O = Mitigable operational impacts

Significance after Implementation of Mitigation Measures (see Chapter VI):

SU = Significant, Unavoidable
 LTS = Less than Significant
 NR = Less than Significant, Mitigation Not Required

ALTERNATIVE A: UNRESTRICTED ACCESS WITH TERMINATION AT SR 92 / SKYLINE BOULEVARD

- Under Alternative A, unrestricted public access for hikers, bicyclists, and equestrians would be allowed between the Portola Gate at the north end and the SR 92 / Skyline Boulevard intersection at the south end. Under this alternative, the proposed trail would be 9.5 miles long. An access easement would be required through Skylawn Memorial Park along its private roads. SFPUC would not be responsible for the purchase of this easement and such an access easement has not been secured. Motorized access would be restricted to official and authorized vehicles only (e.g., SFPUC, California Department of Forestry and Fire Protection [CDF], emergency, and law enforcement vehicles). Improvements required for this alternative include, but are not limited to construction of a parking lot at SR 92 and Skyline Boulevard (for the main access, approximately 50 spaces), expansion of the parking lot at Sneath Lane by approximately 30 spaces (for access to the Portola Gate), installation of five permanent toilets spaced every few miles along the service road, three drinking fountains, three phones, three water troughs, signage, and access barriers. In addition, this alternative would include installation of ecological resource protection barriers for sensitive resources as well as ecological and water quality monitoring stations. If the easement through the cemetery were not granted, a new trail would be necessary under this alignment alternative to connect the Cemetery Gate to the SR92 / Skyline Boulevard intersection. The area proposed for the SR 92/Skyline Boulevard is currently included as part of a Caltrans improvement project. Should this improvement be implemented, the area would not be available for use under Fifield/Cahill Ridge Trail Alternative A. If Fifield/Cahill Ridge Trail Alternative A is selected for adoption by the SFPUC, and if planned SR 92 improvements proceed, an alternate parking location would need to be identified, potentially requiring additional environmental analysis.

ALTERNATIVE B: UNRESTRICTED ACCESS WITH TERMINATION AT SKYLINE QUARRY

Under Alternative B, unrestricted public access for hikers, bicyclists, and equestrians would be allowed between the Portola Gate and Skyline Quarry. Under this alternative, the proposed trail would be 9.7 miles long. Motorized access would be restricted to authorized vehicles only (e.g., SFPUC, CDF, emergency, and law enforcement vehicles). Improvements required for this alternative would be the same as under Alternative A, except that the main parking lot would be constructed at Skyline Quarry. The southern portion of the trail would extend through an existing cypress grove located southeast of Cemetery Gate, rather than extending through Skylawn Memorial Park (Alternative A).

South of SR 92, the Fifield/Cahill Ridge Trail would connect with a trail along Skyline Boulevard extending south to Kings Mountain. This trail, known as Alternative A/B, is addressed at a program-level in this EIR and described in Action tra2 in the Management Plan.

ALTERNATIVE C: ACCESS BY ANNUAL PERMIT

Alternative C would provide public access to the Fifield/Cahill Ridge Trail through purchase of an annual permit. Alternative C would provide pedestrian access only; biking and equestrian use would not be allowed. The East Bay Municipal Utility District allows Watershed access under a program similar to this alternative. The trail would extend between Portola Gate on the north and Skyline Quarry on the south. The number of users per day would be limited and controlled

by SFPUC based on environmental constraints (such as trail condition and special status species sensitivity). Under this alternative, the proposed trail would be 9.7 miles long, and the alignment route would be the same as under Alternative B. Unauthorized bicyclists and equestrians (i.e., all but authorized patrols) would be prohibited on the Fifield/Cahill Ridge Trail. Bicyclists and equestrians would be directed to use the existing San Andreas, Sawyer Camp, Crystal Springs, and Cañada Trails via a new 0.6-mile connector trail (analyzed at a program-level in this EIR) between Sneath Lane and the San Andreas Trail. Motorized access would be restricted to authorized vehicles only (e.g., SFPUC, CDF, emergency, and law enforcement vehicles). Improvements required for this alternative would include, but are not limited to, parking lot construction at Skyline Quarry (improvement of the Sneath Lane parking lot would not be required); five permanent toilets, three drinking fountains, and three public telephones; installation and maintenance of an electronic card-activated gate system; development and implementation of a telephone and internet reservation system; access barriers to intersecting trails/roads that are accessible to bicyclists and equestrians; and professional, docent, and volunteer patrol training.

ALTERNATIVE D: DOCENT-LED ACCESS

- Alternative D would provide the most restricted public use of the proposed Fifield/Cahill Ridge Trail and the highest level of protection of natural resources. Due to this high level of protection, Alternative D has been determined to be the environmentally superior alternative. Under this alternative, docent-led access for groups of up to 25 hikers would be allowed at scheduled times along the Fifield/Cahill Ridge Trail between Sneath Lane and Skyline Quarry. The proposed trail would be 9.7 miles long, and the alignment route would be the same as under Alternative B. Much of the facilities improvements and Watershed staff training required under this alternative would be minimal. The improvements required for this alternative would be the same as Alternative C, except that installation of an electronic gate system, access and ecological barriers, and fire, natural resource, and water quality management/monitoring would not be required under Alternative D. Three docent-led groups could be scheduled per day, allowing a maximum of 75 people per day. Unauthorized bicyclists and equestrians (i.e., all but authorized patrols) would be prohibited on the Fifield/Cahill Ridge Trail. Bicyclists and equestrians would be directed to use the existing San Andreas, Sawyer Camp, Crystal Springs, and Cañada Trails via a new 0.6-mile connector trail between Sneath Lane and the San Andreas Trail. Motorized access would be restricted to authorized vehicles only (e.g., SFPUC, CDF, emergency, and law enforcement vehicles).

A. EXISTING PLANS AND POLICIES

The plans and policies that are relevant to the proposed Fifield/Cahill Ridge Trail are discussed in Section III.A.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for plans and policies impacts, but it generally considers that implementation of the *Peninsula Watershed Management Plan* would have a significant effect on plans and policies if it were to:

- substantially conflict with established regional, state, or federal plans, policies, and/or guidelines, and as a consequence of such conflict, potentially result in an adverse physical impact on the environment.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

The proposed trail would not itself substantially conflict with any applicable plan or policy. In general, potential conflicts of a proposed project or program with the plans and policies of jurisdictions are considered by decision-makers independently of the environmental review process as part of the decision to approve, modify, or disapprove the project or program. The EIR analyzes and provides information on the potential environmental impacts of implementing the proposed Fifield/Cahill Ridge Trail. This information would be used by the SFPUC, the decision-maker, in assessing the extent to which the proposed trail could conflict with the plans and policies of other jurisdictions and in making the decision to approve a trail alternative. The City and County of San Francisco is obligated to publicly notice this document per government code Section 65402(b).

B. LAND USE

1.0 SETTING

See Section III.B for a further description of existing land uses, including a description of existing and planned recreation use in the vicinity of the Watershed.

1.1 EXISTING LAND USES

The Fifield/Cahill Ridge extends through the middle of the Watershed in a generally north-south direction. The ridge and its vicinity are currently undeveloped, with the exception of the Fifield/Cahill Ridge service road, an unpaved access road that extends along the ridge. This service road is occasionally used for routine Watershed operations and maintenance activities, with increases in activities along the service road for specific construction or maintenance projects. Watershed keepers typically patrol the service road daily. The service road is closed to the general public, except for occasional use by organized groups with day-use hiking permits. North of SR 92, the Skylawn Memorial Park future cemetery expansion area is located just west of the ridge. South of SR 92, Skyline Boulevard generally follows the ridgeline that extends south of Cahill Ridge.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for land use impacts, but it generally considers that implementation of the Management Plan would have a significant effect on land use if it were to:

- substantially disrupt or divide the physical arrangement of an established community;
- substantially conflict with established recreational, educational, religious, or scientific uses;
- or have a substantial impact on the existing character of the vicinity.

Land use impacts of the proposed project are evaluated with respect to compatibility with the existing land uses and the potential effect the proposed policies and actions would have on land use patterns in the project vicinity.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Development of the proposed trail along the Fifield/Cahill service road would provide increased public access along this route and through the central area of the Watershed. Development of the trail would expand the use of this road from maintenance and limited, permitted public use to docent-led hiking (Alternative D), permit hiking (Alternative C), or a multiuse trail (hiking, bicycling, and equestrian) (Alternatives A and B). In terms of the significance criteria outlined above, increased public use of this portion of the Watershed would not disrupt or divide the physical arrangement of an established community. Increased public use of the proposed trail would not preclude or substantially interfere with continued use of lands as Watershed lands, except to the extent that this increased access would pose a threat to Watershed facilities, operations, and natural resources. These potential physical effects are discussed individually by resource in this chapter.

C. GEOLOGY AND SOILS

1.0 SETTING

See Section III.C for a further description of geology and soils.

Situated between the eastern flanks of Montara Mountain and Sawyer Ridge, the Fifield/Cahill Ridge constitutes the eastern basin boundary of the Pilarcitos Creek drainage basin and the western hydrologic boundary of the San Mateo Creek drainage. The elevation of the Fifield/Cahill Ridge area is approximately 1,100 feet above mean sea level and the ridge is noticeably flat-topped with gentle, rounded upper slopes and steeper slopes towards the valleys. The proposed Fifield/Cahill Ridge Trail alignments run along the top of Fifield and Cahill Ridges. Sandstone, shale, and conglomerate rocks of Tertiary-age underlie the ridge area.

Younger alluvial and colluvial deposits fill the canyons and swales that extend into the valleys from the ridgelines. The Fifield/Cahill Ridge area is located between the San Andreas and Pilarcitos faults and is considered an area of potential seismic activity. Although the ridge does not cross an active fault trace, the potential exists of surface rupture and landslides associated with activity within the San Andreas Fault Zone.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for geology and seismicity impacts, but it generally considers that implementation of the Management Plan would have a significant geologic or seismic impact if it were to:

- expose people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards;
- cause substantial flooding, erosion, or siltation;
- change topography or ground surface relief features; or
- substantially modify any unique geological or physical features.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Additional public use along to the Fifield/Cahill Ridge service road could result in a greater number of unauthorized off-trail entries onto the Watershed if trail users do not abide by use restrictions (MMWD, 1991; Cerkel, 1994). Unauthorized entry could lead to formation of unsanctioned shortcut trails extending from the ridgeline to the adjoining valleys. The creation and use of unsanctioned trails would consequently result in increased soil erosion. Additionally, unauthorized entry to the restricted portions of the Watershed could result in an increased chance of fire, which would burn vegetation, expose soil, and lead to erosion and increased sedimentation. Alternatives A and B, which would allow unrestricted use by hikers, bicyclists, and equestrians, would result in the greatest potential for unauthorized trail use and therefore erosion. The experience of other open space managers has shown that more serious degradation occurs on property where bicycles are allowed (MMWD, 1991). Impacts under these alternatives could cause substantial erosion and thus be significant. Alternative C would limit the type (hikers only) and number of trail users. However, trail users would be unaccompanied, and off-trail use could occur, but would not be as likely as under Alternatives A and B. These impacts could still be significant. Under Alternatives A, B, and C, compliance with the requirements of the Americans with Disabilities Act (ADA) could result in trail construction or other physical improvements which may also cause substantial erosion. Under Alternative D, hikers would be accompanied by docents who could restrict off-trail use. Such use would not cause significant erosion. Implementation of actions described in Section III.C and Section IV.C

for soil erosion impacts would reduce impacts associated with Alternatives A, B, and C to a less than significant level.

Development of this trail as proposed (under all alternative routes) would attract a greater number of people to the Peninsula Watershed and vicinity and could consequently expose a greater number of people to the hazards of seismically induced groundshaking and fault rupture. However, compared to the number of people in nearby towns who could be subjected to falling debris from buildings, the number of people who might experience exposure to seismic hazards while using the Fifield/Cahill Ridge Trail would be small and this impact would be considered less than significant.

Landslides, both seismically induced and resulting from static soil conditions, are common in areas of steep slopes or unstable, saturated soils. These conditions would typically be found on slopes in canyons and creek valleys in the Watershed, especially on slopes above road cuts. The trail segments that extend along the upper portions of Fifield and Cahill Ridges are less susceptible to landslide hazards because of the gentler slopes and shallower road cuts. The potential landslide hazards could increase along the access trails that follow routes that traverse canyon sides and valley slopes. Implementation of the actions described in Section III.C and Section IV.C for soil instability would reduce potential impacts to a less than significant level.

D. HYDROLOGY AND WATER QUALITY

1.0 SETTING

See Section III.D for a further description of Watershed hydrology and water quality.

Fifield/Cahill Ridge is located approximately in the middle of the Watershed, extending along the north-south length of the Watershed. On the north, the ridge runs parallel to San Mateo Creek on the east and Pilarcitos Creek on the west and does not cross any major creeks or tributaries along its length. The Fifield/Cahill Ridge service road is located near the divide between two drainage basins. On the east side of the ridge, drainage flows to the headwaters of San Mateo Creek and other minor drainages that flow into Crystal Springs Reservoir, and on the west side of the ridge, drainage flows to Pilarcitos Creek and drains to Pilarcitos Reservoir. The project area has been identified as an area of low to moderate water quality vulnerability, with the exception of the saddle between Fifield Ridge and Cahill Ridge (the Five Points area) which has been identified as an area of high water-quality vulnerability. Water quality vulnerability zones were established during the development of the Management Plan to identify those areas that are the most sensitive or vulnerable to disturbance and therefore the least suitable for accommodating Watershed activities. Drainage on the west side of the proposed trail alignment is outside of the Watershed boundaries and flows toward the Pacific Ocean.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for hydrology and water quality impacts, but it generally considers that implementation of the Management Plan would have a significant effect on hydrology and water quality if it were to:

- substantially change absorption rates, drainage patterns, or the rate and amount of surface water runoff;
- substantially degrade water quality;
- contaminate a public water supply;
- substantially degrade or deplete groundwater resources or interfere with groundwater recharge; or
- cause substantial flooding, erosion, or siltation.

Criteria for evaluating surface and ground water quality in the San Francisco Bay Area are based on beneficial uses and water quality objectives established by the Regional Water Quality Control Board, San Francisco Bay Region as authorized under the Porter-Cologne Water Quality Control Act. Both beneficial uses and water quality objectives for the Management Plan area are described in *The Water Quality Control Plan for the San Francisco Bay Basin*, also referred to as the *Basin Plan* (California RWQCB, 1995). Criteria for evaluating impacts to drinking water quality are based on California Drinking Water Standards, as established by the California Safe Drinking Water Act. Criteria for evaluating flooding hazards are based on effects to on-site and downstream 100-year flood zones, as established by the Federal Emergency Management Agency.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Currently, public access to internal access roads within the Watershed is not allowed. However, the SFPUC has provisions to allow access to internal roads with a permit and when accompanied by a guide. As described in Section III.D, increased public use of the Watershed, as well as more extensive use of the area, could indirectly affect water quality due to lack of adequate sanitation facilities along trails, unauthorized body contact with reservoir or creek water, use by domestic animals, erosion from off-trail use, increased littering, and increased potential for fire hazard. In general, the greater the public use of the Watershed, the greater the potential for water quality impacts and fire hazards. In addition, unauthorized off trail use near areas of higher water-quality vulnerability, such as the saddle between Fifield and Cahill Ridges (the Five Points area), would result in greater potential for adverse effects on water quality.

Alternatives A and B would both provide unrestricted access for hikers, bicyclists, and equestrians. Greater equestrian access would increase the amount of horse waste introduced into

the Watershed. If the amount of horse waste were substantial and deposited adjacent to or near waterbodies, it would affect the water quality of the runoff draining to the reservoirs by increasing nutrient levels and coliform bacteria, a significant impact. Alternatives A and B have different alignments just north of SR 92. Alternative A extends to the SR 92 / Skyline Boulevard intersection south of the Cemetery Gate, and this portion would be entirely within areas identified as moderate vulnerability. South of the Cemetery Gate, Alternative B extends to Skyline Quarry and would provide public access and parking near areas identified as high water quality vulnerability. This alignment would be located closer to the interior of the Watershed and to Crystal Springs Reservoir. Alternatives C and D would provide restricted access along the same route as Alternative B (near areas identified as high water-quality vulnerability). Alternative C would require access by annual permit for hiking only, and Alternative D would require docent-led access for hiking only. Alternative A would require construction of a parking lot near the SR 92 / Skyline Boulevard intersection, and Alternatives B, C, and D would require construction of a parking lot at Skyline Quarry. Several other improvements and facilities would be required under all alternatives.

As described in Section III.D, construction of facilities would result in potentially significant water quality impacts from excess sedimentation, increased runoff, and introduction of chemicals and other materials. In addition, the parking lots would promote increased vehicle usage within the Watershed. Vehicle usage is associated with introduction of oil and grease and other urban pollutants into the Watershed, which would be carried in runoff from the parking lot and roadways and could eventually drain to the reservoirs, resulting in a significant impact.

In terms of relative potential impact, Alternative D would have the least potential to affect water quality, because use would be most restrictive under this alternative. Implementation of this alternative would not cause a significant impact on water quality. Alternative C (access by annual permit) would require restricted use and would not allow equestrian or bicycle use and therefore would have limited potential for unauthorized off trail activities within areas identified as high vulnerability. Alternative B would have the greatest potential impact on water quality, since it would promote the highest level of use and would have the greatest potential for unauthorized off trail activities. Alternative A would have somewhat less potential to affect water quality compared to Alternative B, because Alternative A, while also involving unrestricted access, would utilize a trail route that traverses fewer areas of water quality vulnerability. Implementation of Alternative A or B, due to their high level of use and the potential for unauthorized use, could cause substantial erosion and/or degrade water quality. Implementation of the management actions described in Section III.D (under increased public use and development of new facilities), and as required in Section IV.D, would reduce impacts. However, further mitigation measures would be required (see Section VI.D) to reduce these impacts to a less than significant level.

E. NATURAL RESOURCES

1.0 SETTING

See Section III.E for further description of natural resources on the Watershed.

Background research performed for the development of the Management Plan indicated that the Fifield/Cahill Ridge service road passes through or is adjacent to potential habitat for several threatened, endangered, or otherwise sensitive species, including the following:

- Marbled murrelet (old-growth Douglas fir in this area has been designated critical habitat for this species)
- San Francisco garter snake
- California red-legged frog
- Bay checkerspot butterfly
- San Bruno elfin butterfly
- Steelhead trout
- Sensitive plant species including western leatherwood, coast rock cress, California bottle-brush grass, San Francisco wallflower, and Tiburon buckwheat

The presence of these resources, and the initial responses of agencies with jurisdiction over these resources (United States Fish and Wildlife Service [USFWS] and California Department of Fish and Game [CDFG]), suggested the possibility of significant impacts from implementation of Management Plan actions for the Fifield/Cahill Ridge Trail. Lack of quantitative information on the abundance and distribution of sensitive resources made the collection of field survey data a necessary prerequisite for further analysis and planning. The results of these surveys, conducted in 1998, and an assessment of the impacts associated with increased visitor use are presented as a biotic report of the proposed trail development and use. A Biological Assessment is required by Section 7 of the Endangered Species Act when a federal agency has jurisdiction over a project that could have impacts to federally listed species. Such is not the case with the proposed Fifield/Cahill Ridge Trail, but a biotic report following the content and format of a Biological Assessment was determined to be the most effective way to present resource information to the regulatory agencies, trail advocates, the City, and the public at large.

The biotic report included review of existing information, including Oberlander's 1953 botanical inventory of the Watershed lands, Corelli's 1980 review of known localities of special-status plants, and herpetological surveys recently conducted by the California Academy of Sciences. The biotic report also examines public use policy on watersheds managed for urban water supplies in the San Francisco Bay Area and elsewhere. Surveys conducted for the biotic report established presence of the marbled murrelet within the identified critical habitat for this species (which overlaps the Fifield/Cahill Ridge service road) (see Figure III.E-1), California red-legged frog, some listed butterfly species on and immediately adjacent to the road, and sensitive plant species.

Vegetation

The proposed trail along the Fifield/Cahill Ridge service road crosses one of the largest and most pristine expanses of natural habitats in the northern San Francisco Peninsula. The proposed trail area contains extensive old-growth and second-growth forests, shrubs, riparian areas, and aquatic ecosystems, as well as smaller areas of grasslands and other habitats. Along the crests of Fifield and Cahill Ridges, the existing service road offers wide vistas of the Watershed lands and adjacent urban areas. The access road does not include water-associated habitats; however, Mud Dam Pond and Pilarcitos Reservoir lie a short distance away and are visible and accessible from the road.

Table V-3 identifies the natural communities that are present within the Fifield/Cahill Ridge area, the dominant species associated with each, and the areas of occurrence. These communities correspond with the natural plant communities discussed in Section III.E. The dominant plant species listed in Table V-3 include only those observed within the project area during the 1998 surveys, and represent a subset of the species described for the larger Watershed area.

Special-Status Plant Species

Several special-status plant species that have designations of “federal candidate List 2” under the Federal Endangered Species Act and/or California Native Plant Society (CNPS) Lists 1, 2, 3, or 4 are known to occur in the Fifield/Cahill Ridge project area. These species include western leatherwood, Tiburon buckwheat, coast rock cress, San Francisco wallflower, and California bottle-brush grass. The location of these special-status species in the project area is described below. Table III.E-1 and Appendix IX.B list additional special-status species that have the potential to occur based on the Watershed environment and habitat requirements. Species with formal listings as endangered or threatened under the California Endangered Species Act or the Federal Endangered Species Act are described in Section III.E. These species have not been observed in the Fifield/Cahill Ridge Trail route area and predominantly have a low potential for occurrence in that area.

Western leatherwood (*Dirca occidentalis*). Western leatherwood is a CNPS List 1B species that grows in a variety of community types, but typically is found in shaded, moist canyons and partial shade. It ranges from Santa Clara to Sonoma Counties and inland to Alameda and Contra Costa Counties. It has been reported as occurring occasionally, but regularly, within the northern coastal scrub of the Watershed lands (Oberlander, 1953). It was observed at several locations during 1998 surveys, but only one individual was observed in close proximity to the proposed trail route, near a prominent rock outcropping on Fifield Ridge (Environmental Science Associates, 1998).

Tiburon buckwheat (*Eriogonum luteolum* var. *caninum*). This CNPS List 3 plant species is known from Santa Clara to Lake and Colusa Counties. It was observed in a single population of about 50-100 individuals near the proposed trail route on a rock outcrop in close proximity to the Western leatherwood site (Environmental Science Associates, 1998).

**TABLE V-3
NATURAL PLANT COMMUNITIES WITHIN FIFIELD/CAHILL RIDGE AREA**

Community Type	Dominant Plant Species	Area of Occurrence
Valley needlegrass grassland	Idaho fescue (<i>Festuca idahoensis</i>), foothill needlegrass (<i>Nassella lepida</i>), purple needlegrass (<i>Nassella pulchra</i>), California brome (<i>Bromus carinatus</i>), California oatgrass (<i>Danthonia californica</i>)	Small areas on Fifield Ridge
Northern coastal scrub	Coyote brush (<i>Baccharis pilularis</i>), California coffeeberry (<i>Rhamnus californica</i>), poison oak (<i>Toxicodendron diversilobum</i>), creeping wild rye (<i>Leymus triticoides</i>), California blackberry (<i>Rubus ursinus</i>)	Extensive areas on Fifield and Sweeney ridges
Northern coastal scrub with trees	Same as northern coastal scrub, plus Douglas fir (<i>Pseudotsuga menziesii</i>), blue blossom (<i>Ceanothus thrysiflorus</i>)	Southern half of Cahill Ridge
Douglas fir-redwood forest	Douglas fir, coast live oak (<i>Quercus agrifolia</i>), California bay (<i>Umbellularia californica</i>), madrone (<i>Arbutus menziesii</i>), coffeeberry (redwood absent on ridgeline)	Extensive areas on Cahill Ridge
Freshwater marsh/wetland	Sedges (<i>Cyperus</i> spp.), spike rush (<i>Carex eleocharis</i>), rushes (<i>Juncus</i> spp.), tules (<i>Scirpus acutus</i>), cattails (<i>Typha</i> spp.), willows (<i>Salix</i> sp.)	Associated with Mud Dam Pond, Pilarcitos Reservoir, and the quarry near SR 92
Urban/developed	Generally ornamentals	Cemetery at southern terminus of project at SR 92 and Skyline Blvd.
Disturbed	Pampas grass (<i>Cortaderia jubata</i>), sweet clover (<i>Melilotus</i> sp.), willow-herb (<i>Epilobium</i> sp.), many non-native species	Old quarry north of SR 92 near Upper Crystal Springs Reservoir
Exotic forest (Monterey cypress)	Monterey cypress (<i>Cupressus macrocarpa</i>)	Southern portion of Cahill Ridge near SR 92

SOURCE: Environmental Science Associates, 1998

Coast rock cress (*Arabis blepharophylla*). This CNPS List 4 plant occurs on rocky outcrops and grassy slopes in coastal prairie, coastal scrub, and the edges or openings of broadleaved upland forests from Santa Cruz to Sonoma Counties, and inland to Contra Costa County. There are a number of localities for coast rock cress in the Watershed lands and on nearby San Bruno Mountain and Sweeney Ridge. It was observed in a single population of about 100-200 individuals near the proposed trail route on a rock outcrop in close proximity to the Western leatherwood site (Environmental Science Associates, 1998).

San Francisco wallflower (*Erysimum franciscanum*). This CNPS List 4 and federal candidate List 2 species occurs in coastal dunes, coastal scrub, and grasslands, often on soils of serpentinitic or granitic origin. The range of this species is from Santa Cruz to Sonoma Counties. There is a high abundance of this species in extensive areas of mowed brush along the Fifield Ridge service road. This species is found less abundantly in the closed canopy of coastal scrub, and can be seen in lesser numbers throughout Fifield Ridge (Environmental Science Associates, 1998).

California bottle-brush grass (*Elymus californicus*). This tall (over 2 feet) CNPS List 4 plant occurs in North Coast conifer forests from Monterey to Sonoma County. It grows as an understory in the Douglas fir–redwood forest community type along much of Cahill Ridge. An estimated 3,000-5,000 plants occur within the Fifield/Cahill Ridge project area (Environmental Science Associates, 1998).

Wildlife

There are four wildlife habitats within the Fifield/Cahill Ridge area. These habitats include perennial grasslands, coastal scrub, Douglas fir forest, and freshwater emergent wetland. The general characteristics of these wildlife habitats are described in Section III.E. In the Fifield/Cahill Ridge service road area, perennial grasslands are found in small patches on Fifield Ridge. Coastal scrub habitat is found in extensive areas on Fifield and Sweeney Ridges and on the southern half of Cahill Ridge. Douglas fir forest is found in large areas on Cahill Ridge, and freshwater emergent wetlands are found near Mud Dam Pond, Pilarcitos Reservoir, and the former quarry near SR 92.

Special-Status Wildlife

Table V-4 lists all special-status species that are known to occur or have a high or moderate potential to occur along the Fifield/Cahill Ridge service road, based on the distance to the nearest documented occurrence and habitat requirements. Appendix IX.B includes a full list of special-status species that are known or have the potential to occur. These lists were compiled using California Diversity Data Base (CDFG, 1998) search by quadrangle (i.e., Montara Mountain, Woodside, and San Mateo quadrangles) and other data sources (i.e., Environmental Science Associates, 1994 and 1998; Stebbins, 1985). Six of these species have formal listings as endangered or threatened under the California Endangered Species Act or the Federal Endangered Species Act. San Bruno elfin butterfly, Mission blue butterfly, California red-legged frog, San Francisco garter snake, and marbled murrelet have been observed in the project

**TABLE V-4
SPECIAL-STATUS ANIMAL SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PROJECT AREA**

Common name Scientific name	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence along the Ridge Trail Route	Period of Identification
<u>Invertebrates</u>				
Opler's longhorn moth <i>Adella oplerella</i>	FSC/--	Serpentine bunchgrass grassland	High Potential	Spring
Edgewood blind harvestman <i>Calcinia minor</i>	FSC/--	Serpentine rock outcrops and barrens	Moderate Potential	Fall-Winter
Serpentine phalangid <i>Calcina serpentina</i>	FSC/--	Serpentine rocks and barrens	Moderate Potential	Fall-Winter
Bay checkerspot butterfly <i>Euphydryas editha bayensis</i>	FT/--	Serpentine bunchgrass grassland	Habitat occurs on Fifield Ridge	March-May
Mission blue butterfly <i>Icaricia icarioides missionensis</i>	FE/--	Grassland with <i>Lupinus albifrons</i> , <i>L. formosa</i> , and <i>L. varicolor</i>	Moderate Potential	March-June
San Bruno elfin butterfly <i>Incisalia mossii bayensis</i>	FE/--	Found in coastal scrub	High Potential	March-April
San Francisco fork-tailed damselfly <i>Ischnura gemina</i>	FSC/--	Wetlands with emergent vegetation	High Potential	April-October
San Francisco lacewing <i>Nothochrysa californica</i>	FSC/--	Grasslands	Moderate Potential	Spring
Unsilvered fritillary butterfly <i>Speyeria adiastrae adiastrae</i>	FSC/--	Found in native grasslands with <i>Viola pedunculata</i> as larval foodplant	High Potential	Spring
<u>Amphibians</u>				
California red-legged frog <i>Rana aurora draytonii</i>	FT/CSC	Freshwater ponds and slow streams with emergent vegetation for egg attachment	Moderate Potential	April-June
<u>Reptiles</u>				
San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i>	FE/CE	Freshwater ponds and slow streams with emergent vegetation	High Potential	warm days

TABLE V-4 (Continued)
SPECIAL-STATUS ANIMAL SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PROJECT AREA

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence along the Ridge Trail Route	Period of Identification
<u>Birds</u>				
Cooper's hawk <i>Accipiter cooperi</i>	--/CSC	Nests in riparian growths of deciduous trees and oaks	High Potential	March-July
Sharp-shinned hawk <i>Accipiter striatus</i>	--/CSC	Nests in riparian growths of deciduous trees and oaks	High Potential	March-July
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT/CE	Nests in dense, old-growth forests along coast	High Potential	Year-round
Merlin <i>Falco columbarius</i>	--/CSC	A winter visitor of woodlands, foothills, and valleys	High Potential	Winter
Osprey <i>Pandion haliaetus</i>	--/CSC	Nests near freshwater lakes and large streams on large snags	Moderate Potential	March-June
<u>Mammals</u>				
Pallid bat <i>Antrozous pallidus</i>	--/CSC	Roosts in caves, old buildings, and under bark. Forages in open lowland areas and forms large maternity colonies in spring.	High Potential	February-August
Western mastiff bat <i>Eumops perotis</i>	FSC/CSC	Open semi-arid to arid habitats roosting on high cliffs and buildings	High Potential	February-August
Small-footed myotis <i>Myotis ciliolabrum</i>	FSC/--	Roosts in caves, old buildings, and under bark	High Potential	February-August
Long-eared myotis <i>Myotis evotis</i>	FSC/--	Roosts in caves, old buildings, and under bark. Forms maternity colony in the spring.	High Potential	February-August
Fringed myotis <i>Myotis thysanodes</i>	FSC/--	Roosts in caves, old buildings, and under bark. Forms maternity colony in the spring,	High Potential	February-August
Long-legged myotis <i>Myotis volans</i>	FSC/--	Roosts in caves, old buildings, and under bark. Forms maternity colony in the spring.	High Potential	February-August

**TABLE V-4 (Continued)
SPECIAL-STATUS ANIMAL SPECIES REPORTED OR
POTENTIALLY OCCURRING IN THE PROJECT AREA**

Common name Scientific name	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence along the Ridge Trail Route	Period of Identification
<u>Mammals (cont.)</u>				
Townsend's big-eared bat <i>Plecotus townsendii</i>	FSC/CSC	Roosts in caves, old buildings, and under bark. Forages in open lowland areas and forms large maternity colonies in spring.	Moderate Potential	February- August
Badger <i>Taxidea taxus</i>	--/*	Open grasslands with loose, friable soils	Moderate Potential	Year-round
Mountain lion <i>Felis spp.</i>	--/4800	Rural grasslands and woodlands	High	Year-round

Federal Categories (USFWS)

FE = Listed as Endangered (in danger of extinction) by the Federal Government.
 FT = Listed as Threatened (likely to become endangered within the foreseeable future) by the Federal Government.
 FPE = Proposed for Listing as Endangered
 FPT = Proposed for Listing as Threatened
 FC = Candidate to become a *proposed* species.
 FSC = Federal Species of Concern. May be endangered or threatened, but not enough biological information has been gathered to support listing at this time.
 FC3c = Species removed from listing

State Categories (CDFG)

CE = Listed as Endangered by the State of California
 CT = Listed as Threatened by the State of California
 CR = Listed as Rare by the State of California (plants only)
 CSC = California Species of Special Concern
 * = Special Animals
 3511 = Fully protected bird species (Fish and Game Code)
 3503.5 = Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)
 4800 = Mountain lion protection

High Potential = Species expected to occur and meets all habitats as defined in list.
 Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
 Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.
 -- = No listing status.

SOURCE: Environmental Science Associates, 1994, 1998; CDFG, 1998

area, and there is a high potential for the Bay checkerspot butterfly to occur. Observations of these species, or potential for occurrence, in the Fifield/Cahill Ridge area are described below. Section III.E includes further descriptions of these species and their distribution.

Steelhead (*Oncorhynchus mykiss*), a federally threatened species, have been collected in the past within the Watershed, but none were observed during the recent surveys (Environmental Science Associates, 1994 and 1998). However, fish that were either resident trout or steelhead were observed at one of the bridges along Pilarcitos Creek (Environmental Science Associates, 1998). Coast range sculpins (*Cottus aleuticus*) are also known to occur in this reach (Smith, 1991).

San Bruno elfin butterfly (*Callophrys mossii bayensis*). The larvae of this federally endangered species was observed at one location, and larval foodplants were observed along the Fifield Ridge service road (Environmental Science Associates, 1998).

Mission blue butterfly (*Icaricia [= Plebejus] icarioides missionensis*). Adults and eggs of this federally endangered species, as well as one of its foodplant species (*Lupinus albifrons*), were observed along the Fifield Ridge service road. The foodplant for this species was found growing in the roadbed and along the shoulder of the service road (Environmental Science Associates, 1998).

Bay checkerspot butterfly (*Euphydryas editha bayensis*). Several small stands of this species' larval foodplant (*Plantago erecta*) were observed growing along the existing service road and road shoulders between the Portola Gate to Sweeney Ridge and the Five Points intersection. At each of these locations, the biomass of *P. erecta* was quite small, and could probably support no more than a few individuals of the federally threatened Bay checkerspot butterfly. *P. erecta* was also observed growing on a grassy hillside above the road (Environmental Science Associates, 1998).

Myrtle silverspot butterfly (*Speyeria zerene myrtleae*). This species is federally endangered and occurs in coastal native grasslands where its larval foodplant, *Viola pedunculata*, is found. Potential habitat is available at a few patches of native grasslands in the Fifield/Cahill Ridge area. There are no documented occurrences of this species in the Watershed.

- **California red-legged frog** (*Rana aurora draytonii*). In the 1998 survey, 27 adults and 17 juvenile larvae of the federally threatened California red-legged frog were observed in the Fifield/Cahill Ridge area. The Mud Dam Pond site provides the highest quality California red-legged frog habitat within the entire Upper and Lower Crystal Springs Reservoirs region. Unlike the large reservoirs in this area, this permanent pond is never drawn down in summer and fall, and thus a lush zone of emergent and aquatic vegetation is present throughout the year along the stable shoreline. This in turn provides ideal habitat for all life stages of the California red-legged frog (egg, larva, adult), assuring successful reproduction year after year (Environmental Science Associates, 1998). In addition, red-legged frogs have also been documented using the ponds at the Skyline Quarry (California Department of Transportation, 2000).

- **San Francisco garter snake** (*Thamnophis sirtalis tetrataenia*). The federally and state endangered San Francisco garter snake was observed at Mud Dam Pond during the 1998 survey.

There is a well-established, viable population of this federally endangered species in the project area (McGinnis, 1998). In addition, the snake could potentially use ponds in the Skyline Quarry site (California Department of Transportation, 2000).

Marbled murrelet (*Brachyramphus marmoratus marmoratus*). The federally threatened and state endangered marbled murrelet was detected within the designated critical habitat (described in Section III.E), adjacent to the Fifield Ridge service road, north of the Cemetery Gate. Second-year surveys will be conducted to confirm first-year marbled murrelet detection (Environmental Science Associates, 1998).

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for biological resource impacts, but it generally considers that implementation of the Management Plan would have a significant effect on biological resources if it were to:

- have a substantial adverse effect on any species identified as threatened, endangered, candidate, sensitive (rare), as discussed in CEQA Guidelines Section 15380;
- have a substantial adverse effect on the habitat of endangered, threatened, or rare species, or other sensitive natural community identified in local or regional plans, policies, regulations, or on lists compiled by CDFG or USFWS;
- have a substantial adverse effect on federally protected wetlands (including, but not limited to, marshes and riparian areas) as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of CDFG, as defined by Fish and Game Codes 1601-1603; or
- substantially interfere with movement of any native resident or migratory fish or wildlife species, or with established fish or wildlife migratory or dispersal corridors.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Increased Spread of Invasive Species

Although the Watershed currently has a low density and limited distribution of invasive plant species, the adjacent lands have a high density and number of invasive, non-native grasses (e.g., pampas grass), forbs (e.g., purple star thistle), and shrubs (french broom). With increased activity associated with public use of the Fifield/Cahill Ridge, invasive species would likely be transported by visitors onto Watershed lands at a greater rate than occurs at present. There is a pronounced difference between the vegetation community along the Fifield/Cahill Ridge service road and in the adjacent GGNRA lands (Environmental Science Associates, 1998). Seeds of invasive species are likely to be dispersed by the boots of hikers, the hooves and dung of horse, and the tires of bicycles. Invasive plant species may cause:

- a decline in distribution and density of native wildlife habitat, especially of special-status butterfly species limited to a single food source (e.g., the larvae of the Bay checkerspot butterfly is limited to *Plantago erecta*);
- a decrease in native plant diversity, including special status-plant species such as coast rock cress (*Arabis blepharophylla*) and San Francisco wallflower (*Erysimum franciscanum*); and
- a direct modification of the environment, such as transformation from a sensitive plant community of valley needlegrass grassland to a non-native annual grassland.

The establishment of a viable population of invasive non-native species in ecologically sensitive areas may also lead to alterations in the community composition, diversity, and richness of wildlife and plants.

The potential for increased density and distribution of invasive species is proportionate to the increase in the number of visitors to the Fifield/Cahill Ridge Trail. Thus, Alternatives A and B (unrestricted access alternatives) would be likely to cause the greatest dispersal of invasive species and, as a result, the greatest impacts to wildlife and plant species. Of particular note is an infestation of purple star thistle (*Centaurea calcitrapa*) adjacent to the proposed trail, between the Cemetery Gate and SR 92. Under Alternative A, this highly invasive species would be likely to spread into the Watershed as recreation activities increase. Once the species established itself within the Watershed, purple star thistle could pose a threat to native plant communities, important wildlife habitat, and protected plant species.

Alternative C would limit use to hiking only, and the number of users per day would be restricted. The number of users allowed per day would be based on environmental constraints and user demands. Alternative D has the lowest potential to cause the spread of invasive non-native species because access would be limited to hikers only (and potentially equestrian patrols), the number of daily users would be restricted to 75, and trail users would be accompanied by docents trained in the protection of sensitive species.

Action veg6 would implement invasive-plant species control, as described in Section III.E and Section IV.E, and eradication activities and would reduce impacts to a less than significant level under all trail alternatives. However, all the alternatives would increase the time and level of effort it takes to control and eradicate invasive species and would make the effort more difficult and expensive, as recreation activities that spread invasive species occur at the same time as eradication efforts. Regular monitoring for invasive species would be required for those areas surrounding the trail (and within wind corridors where invasive seeds may have been scattered). Eradication efforts would be prioritized and focused in these areas.

Loss of Vegetation and Wildlife Resulting from Recreational Activities

Recreational activities can have adverse effects on vegetation and wildlife. These effects are discussed below.

Wildlife Harassment

Increased human disturbance, such as excessive noise or vegetation trampling, could result in wildlife harassment if the disturbance were intense and prolonged, the species were sensitive, or the disturbance led to changes in wildlife or plant community composition (Foin et al., 1977). Knight and Gutzwiller (1995) demonstrated human disturbance to wildlife in which they found that rapid movements by joggers had a greater effect on wildlife than did walkers and equestrian users. In general, it was determined that human recreational use of an area would lower its wildlife productivity and diversity over time. Recorded behavioral responses include changes in wildlife foraging patterns and altered bird nesting behavior, which have been shown to influence individual vigor and productivity in raptors (Knight and Cole, 1991; Fernandez and Azkona, 1993; Homes et al., 1993). Human intrusion could also reduce the effectiveness of foraging bald eagles when feeding young or on wintering grounds (Garret, 1981, as cited in McGarigal, 1988).

Corvid Increase

Increased human activity in a forested area is often associated with increased use by corvids (i.e., ravens and crows), which consume eggs and young of other bird species. Therefore, public use of the Fifield/Cahill Ridge could attract corvids and result in increased predation of nesting birds. Raven population increases seem to be associated with human activity, disturbed environments, increased food supply of garbage, roadkills, trash, and improved access to fence posts, signs, and structures for nesting and perching (USFWS, 1993). Corvids, in general, are more abundant in coastal areas, especially near seabird colonies where predation on nests is common. The federally threatened and state-endangered marbled murrelets, which only lay one egg per clutch, are especially susceptible to nest predation by corvids (Hamer and Nelson, 1995). A drastic decline in the reproductive success of marbled murrelets could eliminate the population of this species in the Watershed.

Loss of Wildlife

- Use of the proposed trail by bicycles and horses (Alternatives A and B only), and increased vehicle traffic necessary to administer trail use (e.g., patrol vehicles, fire trucks, ambulances), could cause the crushing of San Francisco garter snake, California red-legged frog, or other special-status species. California red-legged frogs have been observed on the Fifield/Cahill Ridge access road (Environmental Science Associates, 1998). The loss of individuals over time would have detrimental effects on species population numbers and extinction rates. As described above, and in Section III.E.2.2. the marbled murrelet is sensitive to human disturbance and fire. Limited public access during the species breeding period from May 15 to August 15 would reduce these impacts.

The San Francisco garter snake is highly regarded by reptile fanciers, and amateur collection has long been considered one of the factors in its decline. Collection of the San Francisco garter snake would not only result in a decline in species number, but also constitute illegal “take” of this species. Illegal collection would be a secondary and speculative impact of the project, but is listed as a significant factor in the decline of the species by the USFWS (1985).

Off-Trail Activity

Off-trail activity may occur at areas of interest that are visible from the Fifield/Cahill Ridge service road if trail users do not abide by use restrictions. In addition, the Fifield/Cahill Ridge

Trail would not provide a single track mountain bike experience, and mountain bikers seeking such an experience could create unauthorized side-trails. These types of unauthorized uses could lead to loss of vegetation that may serve as wildlife habitat. The experience of other water utilities and land management agencies is that increased public access results in an increase in unauthorized off trail activities. For example, the Marin Municipal Water District (MMWD) and the MidPeninsula Open Space District have reported construction of unauthorized single track mountain bike trails in sensitive natural areas. As a result, MMWD policy toward public use of its Watershed has been to prohibit human disturbance in habitat areas in order to protect special-status species (Duffey Company, 1998).

- Plants vary in their tolerance to trampling. In a study by Cole (1993) on several national forests throughout the U.S., plant species abundance and diversity declined where recreational activity was pronounced. Cole attributed these community changes to physical disturbance that only encouraged plants that were resistant to trampling. Areas likely subject to trampling due to off-trail activity would be those adjacent to the proposed trail: non-native grassland, rock outcrops, plant species required as butterfly larval foodplants, and shoreline vegetation in the vicinity of Mud Dam Pond. Unauthorized off trail use could also result in illegal fishing at Mud Dam Pond and Pilarcitos Reservoir, which are in close proximity to the Fifield/Cahill Ridge service road. As noted in the section entitled “Loss of Wildlife” above, collection of the San Francisco garter snake could occur. Unauthorized off-trail use could also result in an increased potential for marbled murrelet disturbance and unauthorized take of other special status plant and animal species. In addition, creation of off-trail routes for biking would damage soil and vegetation. In particular, several access roads provide alternative routes through the Five Points area and could present a significant inducement for bicyclists to expand their use. The proposed trail could also increase the potential for the unauthorized release of domestic animals that have the ability to establish feral populations.

Loss of vegetation, such as coastal scrub, due to off-trail activity may fragment wildlife habitat over time, decrease wildlife cover, and create optimal conditions for seed germination of invasive, non-native plant species. Loss of larval foodplants would affect listed butterflies such as the Mission blue and could ultimately lead to their decline or even elimination from the Watershed.

The experience of other open space managers has shown that more serious degradation occurs on property where bicycles are allowed (MMWD, 1991, 1994). Alternatives A and B would likely cause the greatest loss of vegetation and wildlife resulting from recreational activities (wildlife harassment and loss, corvid increase, and off-trail activity) because the alternatives allow unrestricted access to the Fifield/Cahill Ridge Trail. Alternative C would likely cause some loss of vegetation and wildlife, but to a lesser degree than Alternatives A and B because of restrictions on the type and number of permitted recreational users. Alternative D would likely cause the least amount of vegetation and wildlife loss because the number and frequency of visitors would be restricted, only hiking would be allowed, and trail users would be accompanied by docents that would be expected to enforce prohibition of off-trail use. The Management Plan provides some impact-reduction measures, as described in Section III.E and required in

Section IV.E, including the implementation of patrols, access and ecological resource barriers, enforcement, security, and staff training to manage off-trail use or improper use of the Fifield/Cahill Ridge Trail. Increased security and staffing efforts would be greatest under Alternatives A and B. Such efforts have been successful for the East Bay Municipal Utility District (EBMUD) and East Bay Regional Park District (EBRPD). Impacts of all trail

alternatives would remain potentially significant unless the project-specific mitigation measures listed in Section VI.E were adopted. Alternatives A and B would require all of the mitigation measures to reduce potential impacts to a less than significant level. Alternative C would require Mitigation Measures 1 through 7 and Alternative D would require Mitigation Measures 1 through 3 to reduce potential impacts to a less than significant level.

Loss of Vegetation and Wildlife Resulting from Fires

Section III.G (Fire Management) discusses the potential for increased fire hazard resulting from new recreational activities. A catastrophic fire caused by trail users would adversely affect plant and wildlife species and reduce the diversity of wildlife, since most plant and wildlife species in the Watershed are not adapted to catastrophic fires (e.g., western leatherwood and California bottle-brush grass). Marbled murrelets, which are typically found in the large-diameter, old-growth trees located within its critical habitat (see Section III.E) are especially sensitive to fire. Mistletoe blooms, presence of moss, and dead material in trees are important indicators of suitable nesting habitat for marbled murrelets and provide ideal “ladder fuels” for carrying fire into the forest canopy.

Alternatives A and B would involve the highest relative fire risk due to the fact that there would be no limit to the number of users per day. Alternative C would allow a limited number of hikers per day; thus, the fire risk would be less than Alternatives A and B. However, Alternative C would also increase potential fire risk because it would increase visitor numbers to the Watershed, and hikers would be unaccompanied. Control of nonpermitted uses that increase the risk of fire, such as off-trail use and smoking, would be limited to the enforcement capabilities of Watershed staff and access barriers. This potentially significant fire risk would be reduced to a less than significant level by implementation of programmatic fire management actions (see Sections III.G and IV.G) and project specific access restrictions, monitoring, and surveillance mitigation measures identified in Section VI.E. Under Alternative D, the incidence of fire is least likely to occur because use would be restricted to docent-led hiking groups, with a maximum of 75 people a day.

Construction Activities

Numerous construction activities would be necessary for increased access. These activities include, but are not limited to: (1) construction of a parking lot at Skyline Quarry (Alternatives B, C, and D) or at Caltrans property near SR 92 (Alternative A); (2) improvements to the Sneath Lane parking area (Alternatives A and B); (3) installation of restroom facilities (all alternatives); (4) installation of support facilities that include telephones and water faucets (all alternatives); (5) installation of access and ecological resource barriers and ecological and water quality monitoring stations (Alternatives A, B, and C); (6) installation of signage (all alternatives); and (7) construction of the Sweeny Ridge connector trail (Alternatives C and D).

Construction of the facilities described above could directly pose adverse disturbance to native plant communities and indirectly disturb special-status species that use the communities for food and cover. In areas proposed for parking lot construction or improvement, the land is either bare

and highly disturbed (i.e., Skyline Quarry and Sneath Lane), or paved (i.e., Caltrans property), and occurs near native and non-native trees. The construction of a parking lot and installation of support facilities could disrupt the activities of nesting and perching special-status birds that may use these trees, resulting in a significant impact. (See discussion under Removal of Non-native Trees, Section III.E.) Construction of a parking lot during the breeding season could cause a loss of nests or young through altered nesting behavior or reduced parental attentiveness. Implementation of Action wil2 requires that disturbance to bird nests be avoided during construction, that sensitive species surveys be performed before removal of potential nest trees, and that removal of any nest be deferred until young have fledged. The implementation of this management action, in addition to the guidelines that preserve important roosting stands in non-native trees (Action veg7.1), would reduce the effects of construction on nesting and perching birds to less than significant.

The installation of barriers and signage should reduce adverse effects to wildlife. However, barriers could also inhibit wildlife movement and restrict the ability of prey to escape predators, such as deer fleeing coyotes or poachers. Deer characteristically jump over fences, and the hind feet could become entangled between the top two wires of typical fences (Schemnitz, 1980). These potentially significant impacts under Alternatives A, B, and C would be reduced to a less than significant level by the mitigation measure related to fencing design (see Section VI.E).

F. AIR QUALITY

1.0 SETTING

The information presented in Section III.F is applicable to the Fifield/Cahill Ridge Trail project area as well. Sensitive receptors in the vicinity of the Fifield/Cahill Ridge Trail include Sweeney Ridge Trail users and residences north of the Sweeney Ridge trailhead at Sneath Lane. In addition, a watershed keeper resides at the Pilarcitos Reservoir cottage, west of Five Points and the Fifield/Cahill Ridge Trail route.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for air quality impacts, but it generally considers that implementation of the Management Plan would have a significant effect on air quality if it were to:

- violate any ambient air quality standards;
- contribute substantially to existing or projected air quality violations;
- expose sensitive receptors to substantial pollutant concentrations; or
- permeate its vicinity with objectionable odors.

The Bay Area Air Quality Management District (BAAQMD) has established thresholds for assessment of project impacts on air quality that are commonly employed in determining the significance of air quality impacts under California Environmental Quality Act (CEQA). Construction emissions are typically considered less than significant if appropriate mitigation is provided to minimize particulate emissions. For operational impacts, emissions of 80 pounds per day of reactive organic gases, nitrogen oxides, and inhalable particulates are considered significant. Carbon monoxide emissions are considered in the context of roadside concentrations, measured against the state standard, since carbon monoxide is a local pollutant that does not readily disperse. Sensitive receptors (facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollution) are evaluated by their proximity to potential sources of air pollution. The closer the receptor is to an emission source, the more likely it is that a significant air quality impact could occur.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Construction-Related Emissions

Construction of the facilities associated with the Fifield/Cahill Ridge Trail (i.e., parking lots, restrooms, access barriers, gates, etc.) would generate fugitive dust and other criteria pollutant emissions (see discussion under program-level impacts). As described in Section III.F, construction-related ozone precursor emissions are included in the BAAQMD emission inventory that is the basis for regional air quality plans. Therefore, construction of Fifield/Cahill Ridge Trail facilities is not expected to impede attainment or maintenance of ozone standards in the Bay Area. Construction of parking lots and other trail facilities would involve grading and earthmoving activities. Without implementation of construction-related dust emission-control measures, PM-10 emissions would adversely affect air quality.

Although the total number of facilities associated with each alternative is similar, different improvements (summarized below) are required under each alternative.

- Alternative A would require parking lot improvements at SR 92 / Skyline Boulevard, expansion of the existing parking lot at Sneath Lane, and access and ecological resource protection barriers.
- Alternative B would require construction of a parking lot at Skyline Quarry, expansion of the existing parking lot at Sneath Lane, and access and ecological resource protection barriers.
- Alternative C would require construction of a parking lot at Skyline Quarry, installation of an electronic gate system, and access and ecological resource protection barriers.
- Alternative D would require construction of a parking lot at Skyline Quarry.

Based on the amount of air pollutant emissions generated by construction of the above-listed improvements, the alternatives would be ranked as follows (from lowest to highest air emissions): Alternative D, Alternative C, Alternative A, and Alternative B. However, the

amount of air pollutant emissions resulting from the construction of any of the trail alternatives would be potentially significant. Implementation of actions described in Section III.F under construction-related emissions, and as required in Section IV.F, would reduce potential impacts to a less than significant level (BAAQMD, 1996).

Operational Emissions

As described in Section V.J, Traffic and Circulation, the amount of vehicular traffic generated by users of the proposed Fifield/Cahill Ridge Trail would be influenced by the availability of parking at the trailheads.

It is expected that peak usage of the Fifield/Cahill Ridge Trail would occur on weekend days (with usage on weekdays at about one-third of weekend usage). Under Alternative A, unrestricted use of the Ridge Trail between the Portola Gate and SR 92 (near Skyline Boulevard) would generate an estimated 300 vehicle trips per day on weekends and about 100 daily vehicle trips on weekdays. For the other three alternatives: Alternative B – 266 daily weekend trips and 82 daily weekday trips; Alternative C – 230 daily weekend trips and 76 daily weekday trips; and Alternative D – 150 vehicle trips on each day that has three docent-led tours. Based on the number of vehicle trips and resultant air pollutant emissions, the alternatives would be ranked (from lowest to highest air emissions): Alternative D, Alternative C, Alternative B, and Alternative A.

The *BAAQMD CEQA Guidelines* do not suggest a detailed air quality analysis for projects generating less than 2,000 vehicle trips per day, because the District does not consider such increases to be substantial (BAAQMD, 1996).

In addition to an increase in motor vehicle trips, the proposed Fifield/Cahill Ridge Trail would increase fugitive dust emissions at a local level. The use of the trail would trigger the need for increased patrolling, maintenance, and fire safety practices. Each of these activities could generate dust. However, the amount of dust generated by these activities would be minimal, for the most part would remain in the immediate vicinity of the trail, and therefore would not substantially affect regional PM-10 emissions.

G. FIRE MANAGEMENT

1.0 SETTING

Fire hazards along Fifield and Cahill Ridges are highly variable (see Figure III.G-1). The fire hazard represented by plant material fuel complexes along the ridges is described below, and a complete description of vegetative resources is included in Section V.E, Natural Resources. Fifield Ridge primarily consists of northern coastal scrub, with a few small patches of valley needlegrass grassland, and is predominately classified as moderate fire hazard severity because the amount of fuel loading is relatively low. A small patch of northern coastal scrub, located in the northern portion of Fifield Ridge, is classified as high severity.

Between Five Points and the Cemetery Gate, Cahill Ridge consists of a variety of plant communities, including northern coastal scrub with and without trees, exotic Monterey cypress forest, and an extensive area of Douglas fir/redwood forest. This portion of the trail route extends for over two miles and has a high severity rating. Litter and dead woody materials in the understory of this area pose a severe fire hazard under hot, windy climatic conditions, which are conducive to fire ignition. Between the Cemetery Gate and Skyline Quarry is a Monterey cypress forest that has many dead tree limbs on the lower trunks. This area has a high severity rating.

The resources at risk in the Fifield/Cahill Ridge area include personal safety and natural resources, as described in Section III.G, and property resources that include a Watershed keeper cottage, and above-ground water facility structures. Some of the resources could be historic (see Section III.H, Cultural Resources). Fire behavior (including topography and climate) and the fire protection system of the Fifield/Cahill Ridge area are described in Section III.G.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for increased risk of fire, but it generally considers that implementation of the Management Plan would result in a significant effect on fire risks if it were to:

- expose people or structures to a substantial risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands; or
- substantially interfere with an emergency response plan or emergency evacuation plan.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Increased Risk of Fire Hazard Due to Increased Human Presence

The Peninsula Watershed has an active fire suppression program. This program, and natural forest processes, have resulted in heavy accumulations of fuel material in the understory of the Douglas fir forest and Monterey cypress forest on Cahill Ridge and in the spread of shrubs into grassland communities. As a result, several areas with high wildfire severity exist along Fifield and Cahill Ridges, as described above and in Section III.G. Greater public use would increase wildfire ignition potential due to the increased likelihood of unauthorized activity, such as smoking or camping (FEMA, 1998). In the Fifield/Cahill Ridge area, this potential would be significant because of the high wildfire severity rating of areas along the trail route. Approximately 90 percent of the fires that start on the Watershed lands now stem from human ignition.

Fifield/Cahill Ridge Trail Alternatives A and B would allow unlimited access to hikers, bicyclists, and equestrians. The establishment of an unlimited access trail would increase the

human presence in the Fifield/Cahill Ridge area. Because trail use would be unrestricted, a high potential exists under these alternatives for unauthorized activity (i.e., camp or cooking fires, smoking, etc.). Control of unauthorized activities would be limited by the enforcement capabilities of Watershed staff and access barriers. Emergency response times along the Fifield/Cahill Ridge service road could increase if emergency vehicles are impeded by trail users. In addition to the potential for increased emergency response time, difficult emergency access due to physical terrain could contribute to a potentially significant impact. Because uses and requirements would be the same, Alternative B would have the same risk of potential ignition as Alternative A; however, Alternative B would have a greater potential for catastrophic wildfire following ignition because fuel hazard along this alignment is greater.

Alternative C would restrict access to hikers only, on an annual permit basis. The number of permits issued would be restricted, resulting in a lower number of trail users than under Alternatives A and B. Hikers would be unaccompanied, resulting in potential unauthorized activities; however, the permit process could deter visitors that are likely to engage in unauthorized activities. Alternative D would allow docent-led access to hikers only, and would limit visitors to 75 trail users per day. The presence of the docent would deter visitors from engaging in unauthorized activities. Although the risk of ignition would be lower under Alternatives C and D, the trail route for these alternatives passes through areas of high wildfire severity, including the Monterey cypress forest near Skyline Quarry. Unlike trees in an urban setting, trees in this forest have not been pruned to remove dead or dying branches. This could increase the risk of fire and increase the severity of any fire that may occur.

Increased visitation to the Watershed under operation of the proposed Fifield/Cahill Ridge Trail would cause potentially significant fire ignition risks. The Management Plan includes substantial improvements in SFPUC's ability to reduce the risk of fire ignition, as described in Sections III.G and IV.G. In addition, the requirements of Actions tra1a, tra1b, and tra1c would require fire protection activities commensurate with those of the Fire Management Plan, prior to increasing public access. Implementation of the Fire Management Plan prior to increasing public access could require implementing applicable fire management actions (i.e., installation of helispots) earlier than called for in the management plan phasing, as required in Section VI.G. Section VI.G also proposes a mitigation measure related to forest maintenance activities under Alternatives B, C, and D. Implementation of these actions and mitigation measures would reduce these potential impacts to a less than significant level. However, the risk of wildfire ignition is still a serious concern.

H. CULTURAL RESOURCES

1.0 SETTING

See Section III.H for a further description of cultural resources.

Fifield/Cahill Ridge, between the Portola and Cemetery Gates, has been identified as a zone of cultural resource sensitivity. Additional areas of cultural resource sensitivity are located to the

east of Skylawn Memorial Park, in the vicinity of the Skyline Quarry, and along SR 92. Pilarcitos Dam, Pilarcitos Dam No. 1, Pilarcitos Aqueduct, Pilarcitos Cottage, and Pilarcitos side flume are historic structures located west of the Fifield/Cahill Ridge service road, near Five Points. Mud Dam is a historic structure that is located east of the service road, near Five Points. In addition, historic tunnels cross the access road near Five Points and north of Cemetery Gate.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for cultural resource impacts, but it generally considers that implementation of the Management Plan would have a significant effect on cultural resources if it were to result in irreversible damage or disruption to:

- an important prehistoric, historic, or historic archaeological site;
- a historic resource; a property that is listed or determined eligible for listing in the California Register of Historic Resources or a local register of historic resources, per Section 5020.1 of the Public Resources Code; or
- a paleontological site (except as part of a scientific study).

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Increased public access and construction of trail facilities would increase the potential for disturbance to known and unknown cultural resources. As stated above, the Fifield/Cahill Ridge service road extends through areas of cultural resource sensitivity and is within a short distance of several historic structures. Construction activities required for parking lots, restroom, and other facilities could unearth significant known or unknown archaeological resources. Construction of facilities at Skyline Quarry or the SR 92 / Skyline Boulevard intersection could significantly impact known areas of cultural resource sensitivity.

Increased public access could result in vandalism or inadvertent damage to cultural resources. In addition, unauthorized off-trail use could result in damage to historic structures at Pilarcitos Reservoir and Stone Dam. Because Alternatives A and B would allow unrestricted public access and would not limit the number of users allowed per day, these alternatives could result in substantial damage to cultural resources if they result in unauthorized trail use. Alternative C, which limits the number of hikers and prohibits bicycle and equestrian use, would pose a lower potential for damage of cultural resources. Alternative D would provide the most restricted public use of the Fifield/Cahill Ridge Trail. Because all public access under this alternative would consist of docent-led hiking groups and would be limited to 75 visitors per day, the alternative would pose the lowest potential for damage of cultural resources.

Implementation of actions described in Section III.H, under the headings “Increased Public Access” and “Construction Activities,” and mitigation measures proposed in Section IV.H, would reduce impacts to a less than significant level.

I. AESTHETICS

1.0 SETTING

See Section III.I for a further description of aesthetic resources.

The Fifield/Cahill Ridge service road is mostly undisturbed and contains few man-made structures, other than the existing, mostly unpaved, roadway. The service road extends from the Portola Gate, at the southern extent of the existing Sweeney Ridge Trail, to SR 92. Watershed lands along the northern portion of the service road (Portola Gate to north of Five Points) consist primarily of grasslands, with scattered areas of chaparral, coastal scrub, and oak woodlands. Views to the west consist of undeveloped ridges, within and beyond the Peninsula Watershed, and the City of Pacifica. Views to the north, south, and east are primarily restricted to the Watershed by intervening ridges, such as Sweeney Ridge and Sawyer Ridge. The middle portion of the service road area is heavily forested with a mixture of eucalyptus, Monterey cypress, pine, California bay, and coast live oak. Due to the density of vegetation in this portion of the trail, views from the route are restricted to those areas immediately adjacent to the route.

Skylawn Memorial Park is located southwest of the Cemetery Gate. The northern portion of the Skylawn Memorial Park property consists of grasslands, while the cemetery itself consists of landscaped lawns. The entrance road to the cemetery from SR 92 is bordered by heavily forested vegetation. Views from the Skylawn Memorial Park property to the west include ridges that are mostly undeveloped, and the San Mateo County coastline. Views to the east are restricted to the heavily forested Watershed lands.

South of the Cemetery Gate, the service road continues through the heavily forested Watershed lands to the Skyline Quarry. The Skyline Quarry area consists of disturbed vegetation and exposed rock faces. Views along the western edge of the Watershed south of SR 92 consist primarily of densely forested lands, SR 35, and intermittent residences.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for visual quality, but it generally considers that implementation of the Management Plan would have a significant effect on visual quality if it were to:

- have substantially negative aesthetic effects;
- substantially degrade or obstruct scenic views from public areas;

- substantially violate the scenic easement granted to the U.S. Department of the Interior (implemented by the National Park Service – Golden Gate National Recreation Area [GGNRA]); or
- produce substantial light or glare.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Fifield/Cahill Ridge Trail Facilities

Implementation of the Fifield/Cahill Ridge Trail project would not require alteration of the existing service road. The Fifield/Cahill Ridge Trail alternatives would provide public access to the area for recreation, at varying levels of use. Each of the alternatives includes parking lot construction or improvement, permanent toilets, drinking fountains, public telephones, and signage. In addition, Alternatives A, B, and C would include access barriers to intersecting trails/roads and ecological resource protection barriers (i.e., deer fencing), and Alternatives A and B would include horse water troughs (Environmental Science Associates, 1998). Each of these facilities would alter the aesthetic quality of the ridge area. However, the facilities are small in scale and would constitute a minor change in the aesthetic quality of the ridge area. The facilities would not be visible from areas outside the Watershed, except where placed at trailheads. The parking lot, restroom, and other facilities proposed for construction at Sneath Lane (all alternatives) could be visible from residences east of the trailhead. There is a parking lot at the Sneath Lane trailhead, and the addition of parking and other facilities would constitute a minor change in the aesthetic quality of the area. Under Alternative A, a parking lot, restroom, and other facilities are proposed for the SR 92 / Skyline Boulevard trailhead. There are no residences or other development along the roadways in this area; however, the facilities could be visible to travelers on SR 92, Skyline Boulevard, and the entrance to Skylawn Memorial Park. Under Alternatives B, C, and D, trailhead facilities would be located at the Skyline Quarry and would not be visible from SR 92 or other areas outside the Watershed. Although the facilities proposed for the trail are small in scale, implementation of the actions described in Section III.I, under the heading “Installation of New Facilities,” and as required in Section IV.I, would ensure that design criteria and other measures were implemented and that impacts would be minimized.

Improper Use of the Fifield/Cahill Ridge Trail

Increased use of the ridge for recreation could result in improper use of the area and cause damage to vegetation, litter, and off-trail use by bikers and others. The potential for improper use is higher under unrestricted and annual permit access (Alternatives A, B, and C) than under docent-led access (Alternative D). Improper use and damage of the area would result in decreased aesthetic quality to Fifield/Cahill Ridge Trail users. Use of the trail would be concentrated at trailheads, and litter and vegetation damage at trailheads could be visible to the off-site areas described above, detracting from the aesthetic quality of those areas. In addition, improper use could result in fires, causing widespread disturbance of vegetation in the Watershed, including devegetated, blackened areas (see Section V.G). Implementation of

actions described in Section III.I, under the heading “Increased Public Use,” and as required in Section IV.I, would reduce impacts to a less than significant level.

J. TRANSPORTATION AND ACCESS

1.0 SETTING

Roadways that would provide access to parking areas for potential trailheads for the Fifield/Cahill Ridge Trail are Sneath Lane (northern trailhead location) and State Route 92 and Skyline Boulevard (southern trailhead locations) (see Figure V-1). Descriptions of these roadways are presented in Section III.J.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

Traffic Circulation

The City has not formally adopted significance standards for traffic circulation impacts, but it generally considers that implementation of the Management Plan would have a significant effect on traffic circulation if it were to:

- cause an increase in traffic that is substantial in relation to existing traffic load and capacity of the street system (as defined by local government plans and policies); or
- interfere with the existing transportation network, causing substantial alterations to circulation patterns or major traffic hazards.

Transportation

Parking. The City has not formally adopted significance standards for parking impacts, but it generally considers that implementation of the Management Plan could have a significant effect if it were to:

- result in a substantial, unmet parking demand that leads to hazardous pedestrian and traffic conditions.

Pedestrian and Bicycle Safety. The City has not formally adopted significance standards for impacts related to pedestrian and bicycle safety, but it generally considers that implementation of the Management Plan could have a significant effect on pedestrian or bicycle safety if it were to:

- result in a substantial hazard to pedestrians or bicyclists.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Traffic and Parking Impacts

- In general, the amount of vehicular traffic generated by users of the Fifield/Cahill Ridge Trail would be influenced by the availability of parking at the trailheads.¹ The exception would be Alternative D, under which access would be limited to no more than 25 people per docent-led group and up to three groups per day as established by the Management Plan. Under Alternatives A and B, and to a lesser degree, Alternative C, there would be a higher potential for excess trail use, with associated spillover of parking outside of the designated trailhead parking areas. Such spillover could occur along SR 92 and City of San Bruno streets near the Sneath Lane parking lot. Section VI.J includes a mitigation measure that would reduce this potential impact to a less than significant level. Alternative A would be expected to generate the highest number of vehicle trips, because trail-use parking could spill over into the parking lot for the nearby Vista Point (at the intersection of Skyline Boulevard / SR 92), resulting in potential traffic safety impacts, as described in the following section.

It is expected that peak usage of the Fifield/Cahill Ridge Trail would occur on weekend days (with usage on weekdays at about one-third of weekend usage). The average length of stay on the trail is assumed to be about four hours. Although some people might not find parking spaces when they arrive at the trailhead parking lot, the vehicle trips made by these people are accounted for in the analysis of trip generation presented below, even though the people would not be able to use the trail at that time.

Under Alternative A, unrestricted use of the Ridge Trail between the Portola Gate and SR 92 (near Skyline Boulevard) would generate an estimated 300 vehicle trips per day on weekends and about 100 daily vehicle trips on weekdays. As stated in Section III.J, SR 92 carries about 24,000 vehicles per day (on both weekdays and weekend days) in the project area, and the added weekend traffic associated with the Fifield/Cahill Ridge Trail would represent an increase of about 1 percent; trail-generated traffic on weekdays would increase by less than 0.5 percent. Such increases would not be noticeable within the daily fluctuations of traffic volumes, and the impact would be less than significant.

The other three alternatives would generate fewer vehicle trips than Alternative A: Alternative B – 266 daily weekend trips and 82 daily weekday trips; Alternative C – 230 daily weekend trips and 76 daily weekday trips; and Alternative D – 150 vehicle trips on each day that has three docent-led tours. As would be the case under Alternative A, such increases would not be noticeable within the daily fluctuations of traffic volumes, and the impact would be less than significant.

¹ It was estimated that the parking capacity would be about 50 spaces at the trailhead on SR 92 near Skyline Boulevard (after improvements of the existing dirt area) (Alternative A), and would be about 30 spaces at the trailhead at the end of Sneath Lane (which currently accommodates about 20 vehicles) (all alternatives). For purposes of this analysis, it was assumed that the parking area at the Skyline Quarry would have a 50-space capacity (Alternatives B, C, and D).

Traffic Safety Impacts

Bicycle safety issues are discussed in Section III.J. Under Alternative A, drivers turning left from eastbound SR 92 into the parking area would be accommodated by the existing left-turn lane onto Skylawn Drive. Left turns onto SR 92 from the parking area (i.e., from Skylawn Drive) would have to be made in a gap in the traffic streams from both directions. This would be complicated by the fact that eastbound vehicles on SR 92 come from both SR 92 west of Skyline Boulevard and from Skyline Boulevard. Vehicles making turns into and out of the trailhead parking area would be delayed, which could cause some drivers to accept a smaller-than-optimum gap in the traffic streams. This would occur more often on weekends than on weekdays.

Alternative A would create the potential for another safety impact if the trail's parking area on SR 92 near Skyline Boulevard were fully occupied and people chose to park at the nearby Vista Point and walk across SR 92 to the trailhead. Such a scenario would create hazardous conditions for pedestrians and is considered a significant impact, unless mitigation measures were implemented (see Section VI.J).

Under Alternatives B and C, road curves on SR 92 would restrict the ability of drivers to see when a vehicle has stopped and is waiting for a gap in the opposing traffic stream in order to turn into the Skyline Quarry staging area. The absence of an exclusive left-turn lane on SR 92 to separate turning traffic from through traffic, and the volume of traffic traveling on SR 92, would exacerbate the potential traffic safety problem. The most recent three-year summary of accident data (1995-97) indicates that SR 92 had an accident rate higher than the statewide average for roadways of this type (Caltrans, 1998). Widening SR 92 to create enough width for a separate left-turn lane would be problematic because of vegetation removal and other environmental effects associated with building up the downslope adjacent to eastbound SR 92. There would be a need to restrict left turns from SR 92 into the staging area during peak-use times of the day, and possibly prohibit turns at all times (because of the problem of establishing when those peak-use times of the day would be). People driving to the staging area should be directed to use I-280 to access SR 92 from the east (i.e., ending the inbound trip with a right turn into the staging area). Left turns from the staging area onto eastbound SR 92 would not be a traffic safety hazard because the available sight distance is sufficient to allow left-turning drivers to see an adequate gap in the traffic streams. Implementation of these alternatives would result in potentially significant traffic safety impacts. Mitigation measures developed in this EIR (see Section VI.J) would reduce this impact to a less than significant level.

Under Alternative D, only three docent-led tours a day would be allowed, and inbound left turns from SR 92 into the Skyline Quarry staging area would be an infrequent occurrence. However, users would arrive in concentrated groups. Therefore, the traffic safety hazard potential would potentially be significant. Implementation of mitigation measures (see Section VI.J) would reduce potential traffic safety hazards associated with turns into the Skyline Quarry staging area to a less than significant level.

K. UTILITIES AND PUBLIC SERVICES

1.0 SETTING

See Section III.K for a further description of utilities and public services.

Currently, there are no public services provided along the Fifield/Cahill Ridge Trail route. Watershed keepers routinely patrol the area for signs of trespass and inspect facilities and infrastructure for damage.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for utilities and public services impacts. Increase in demand for utilities or public services associated with implementation of the Management Plan would not in itself be considered a significant physical environmental impact. However, if such demand were to result in the expansion of existing facilities or construction of new facilities, and if construction or operation of these expanded or new facilities were to result in a significant effect on the physical environment, implementation of the Management Plan would be considered to have a significant utilities or public services impact.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Public Services and Utilities and Infrastructure

Implementation of the Management Plan would include provision of expanded public recreational and educational opportunities in the Fifield/Cahill Ridge Trail area. Plan implementation would also provide public services for recreation users, including permanent vault restrooms (pumped approximately every two weeks), water fountains, and public telephones.

Additional fire management infrastructure, increased staffing, and increased safety and security activities would be required to protect water quality and Watershed resources. In addition, public use of the Fifield/Cahill Ridge Trail could result in increased accident potential and a resultant increase in demand for emergency services. Increased demand for public services would not be considered a significant impact.

Use of Fifield/Cahill Ridge for public access would not require additional utilities and infrastructure, beyond those associated with the public services described above.

L. NOISE

1.0 SETTING

1.1 FIFIELD/CAHILL RIDGE TRAIL SPECIFIC AREA

The Fifield/Cahill Ridge and its vicinity are currently undeveloped, with the exception of the Fifield/Cahill Ridge service road, an unpaved access road that extends along the ridge. Traffic on the service road is limited to SFPUC maintenance vehicles and does not contribute measurably to ambient noise levels, due to infrequent use. A Watershed keeper cottage is located west of Five Points, adjacent to Pilarcitos Reservoir.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not adopted significance standards for noise impacts, but it generally considers that implementation of the Management Plan would have a significant noise impact if it were to:

- substantially increase noise levels at the location of any sensitive receptors over an extended period of time; or
- substantially increase noise levels to a degree that would affect the use and enjoyment of proximate areas or facilities.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

CONSTRUCTION NOISE

Construction of facilities associated with the Fifield/Cahill Ridge Trail (i.e., parking lots, restrooms, access barriers, gates, etc.) would be required for increased public use on the service road. Although the total number of facilities associated with each alternative is similar, different improvements (summarized below) are required under each alternative.

- Alternative A would require parking lot improvements at SR 92 / Skyline Boulevard, expansion of the existing parking lot at Sneath Lane, and access and ecological resource protection barriers.
- Alternative B would require construction of a parking lot at Skyline Quarry, expansion of the existing parking lot at Sneath Lane, and access and ecological resource protection barriers.
- Alternative C would require construction of a parking lot at Skyline Quarry, installation of an electronic gate system, and access and ecological resource protection barriers.
- Alternative D would require construction of a parking lot at Skyline Quarry.

Although there would be noise increases associated with construction of these facilities, there are no sensitive receptors immediately adjacent to or near construction areas. Traffic increases on SR 92 and Skyline Boulevard due to construction of the proposed facilities would not significantly increase noise levels due to the high traffic noise levels that already occur along these roadways. Residences north of Sneath Lane are separated from the parking lot area by hills. Construction of the Sneath Lane facilities would result in increased truck traffic on Sneath Lane, but would not be expected to significantly affect existing ambient noise levels due to the small number of deliveries that would be required and the separation between the construction area and sensitive receptors. Therefore, potential noise impacts related to facility construction would be less than significant.

OPERATIONAL NOISE

Increased public use of the proposed Fifield/Cahill Ridge service road would not result in any significant noise increases because the uses allowed (hiking, and biking and equestrian use under Alternatives A and B only) are not considered major sources of noise and generally do not result in noise disturbance. Increased public use of the service road would result in a small increase in motor-vehicle use associated with ranger patrols. However, there are no sensitive receptors located in the vicinity of the proposed trail other than the Watershed keeper cottage near Pilarcitos Reservoir, which is located about a mile from the service road.

Under Alternative A, the proposed trail would extend through Skylawn Memorial Park. Depending on the location of the trail alignment, there would be a potential for noise conflicts between cemetery users and trail users, particularly during funerals or gravesite visitations. This would be a potentially significant impact. Section VI.L includes a mitigation measure that would reduce potential impacts to a less than significant level.

Traffic increases on SR 92 and Skyline Boulevard associated with public access of the Skyline Quarry or SR 92 / Skyline Boulevard parking lot would not significantly increase noise levels due to the high traffic noise levels that already occur along these roadways. Noise increases on Sneath Lane associated with increased public access at the Sneath Lane parking lot could be more noticeable because use of this roadway is currently limited. However, no significant noise increases along Sneath Lane are anticipated given the limited size of the parking lot (minimizing the number of vehicles traveling to/from this lot), the proposed hours of trail operation (day-use only), and the separation between the parking lot and sensitive receptors.

M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

1.0 SETTING

1.1 FIFIELD/CAHILL RIDGE TRAIL SPECIFIC AREA

The proposed Fifield/Cahill Ridge Trail consists of existing unpaved roadways through wildlands. Hazardous materials are not currently stored or used in this portion of the Watershed.

Under Alternatives B, C, and D, the proposed terminus of the trail would be at Skyline Quarry. Historical quarry operations could have included the use and storage of hazardous materials. Therefore, hazardous materials could be present from these uses in the quarry area. As described in Section III.M, there is a detonation site used by San Francisco and San Mateo County police at this site.

2.0 IMPACTS

Hazardous wastes and hazardous materials, if mishandled, could pose risks to the public. Potential health and safety impacts typically could stem from interactions of workers or employees with hazardous wastes encountered during project construction.

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for hazard impacts, but it generally considers that implementation of the Management Plan would have a significant hazards effect if it were to:

- involve a substantial risk of accidental explosion or release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation);
- expose people to existing sources of potential hazards, including hazardous materials;
- create a public health hazard or potential public health hazard; or
- potentially interfere with an emergency response plan or emergency evacuation plan.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Potential Contamination at the Skyline Quarry

Historic mining operations at Skyline Quarry may have involved the use and storage of hazardous materials. Under Alternatives B, C, and D, the Fifield/Cahill Ridge Trail would terminate at Skyline Quarry. If historic quarry operations did result in contamination within the quarry, the potential exists for workers to be exposed to contamination while constructing parking and associated trailhead facilities. The potential also exists for trail users investigating open cuts or other exposed geologic features to be exposed to contamination from historic uses and/or from material and debris related to the detonation site. Implementation of the action described in Section III.M and the mitigation measures proposed in Section IV.M would be required to reduce impacts from construction of facilities to a less than significant level.

Illegal Dumping of Hazardous Waste

Fifield/Cahill Ridge Trail Alternatives A and B would establish a trail with unlimited access to hikers, bicyclists, and equestrians. Currently, visitors are allowed onto the Watershed by permit

only and must be accompanied by a docent. The establishment of an unlimited access trail would increase human presence in the Watershed.

The increase in human presence and accessibility to an isolated, remote area of the Watershed could increase the likelihood of illegal dumping of wastes, including hazardous wastes. However, this potential generally exists in all wildlands and open space preserves and would not be considered a substantial threat to the public or the Watershed.

N. ENERGY

1.0 SETTING

1.1 FIFIELD/CAHILL RIDGE TRAIL SPECIFIC AREA

The Fifield/Cahill Ridge Trail route is an existing maintenance/access road. Watershed keepers routinely use the road to patrol the area for signs of trespass and inspect facilities and infrastructure for damage.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for energy impacts, but it generally considers that implementation of the Management Plan would have a significant effect on energy if it were to:

- encourage activities that resulted in the use of large amounts of fuel or energy;
- use energy resources in a wasteful manner; or
- have a substantial effect on the potential use, extraction, or depletion of a natural energy resource.

2.2 FIFIELD/CAHILL RIDGE TRAIL IMPACTS (PROJECT-LEVEL)

Construction-Related Energy Use

Construction of the facilities associated with the Fifield/Cahill Ridge Trail (i.e., parking lots, restrooms, access barriers, gates, etc.) would consume energy (see impact discussion in Section III.N). Although the total number of facilities associated with each alternative is similar, different improvements (summarized below) are required under each alternative.

- Alternative A would require parking lot improvements at SR 92 / Skyline Boulevard, expansion of the existing parking lot at Sneath Lane, and access and ecological resource protection barriers.

- Alternative B would require construction of a parking lot at Skyline Quarry, expansion of the existing parking lot at Sneath Lane, and access and ecological resource protection barriers.
- Alternative C would require construction of a parking lot at Skyline Quarry, installation of an electronic gate system, and access and ecological resource protection barriers.
- Alternative D would require construction of a parking lot at Skyline Quarry.

The energy requirements for the alternatives would be ranked as follows (from lowest to highest): Alternative D, Alternative C, Alternative A, and Alternative B. However, the amount of energy required to implement any of the trail alternatives would not be significant.

Operational Energy Use

Development of the Fifield/Cahill Ridge Trail as proposed (including alternative routes) would attract a greater number of people to the Peninsula Watershed. Implementation of any of the trail alternatives would therefore increase energy consumption over current levels, primarily due to the increase in vehicle trips. Alternatives A and B are expected to result in a similar increase in vehicle trips, since both alternatives would allow unrestricted access (from different primary trailheads). Alternative C would allow individual access by annual permit, while Alternative D would only allow access to docent-led groups. In addition, operation of the Fifield/Cahill Ridge Trail would require an increase of maintenance vehicle trips, fire management activities, and patrols. Increases in the number of vehicular trips and the associated fuel consumption would not be considered substantial and would not drain energy resources. Therefore, operation of the trail under any of the alternatives would result in a less than significant impact.

REFERENCES – Fifield/Cahill Ridge Trail Project Description, Environmental Setting and Impacts

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CHAPTER VI

FIFIELD/CAHILL RIDGE TRAIL MITIGATION MEASURES

This chapter proposes mitigation measures for the potential impacts discussed in Chapter V. Mitigation measures are proposed for two categories of impacts:

1. Impacts for which the Management Plan does not include actions that would reduce potential impacts.
2. Impacts for which the Management Plan does include actions that would reduce potential impacts but not to a less than significant level.

This chapter assumes that the impact-reducing actions discussed in Chapter III would be adopted and implemented along with the actions that could result in potential impacts. If the impact-reducing actions were not adopted (i.e., due to funding), the SFPUC would need to adopt findings of overriding considerations prior to implementing those actions that could result in potentially significant impacts unless more project specific subsequent analysis demonstrated that a significant impact would not occur.

A. EXISTING PLANS AND POLICIES

No potentially significant or significant impacts have been identified, and no mitigation is required.

B. LAND USE

No potentially significant or significant impacts have been identified, and no mitigation is required.

C. GEOLOGY AND SOILS

The program-level, impact-reducing actions and proposed mitigation measures identified in Sections III.C and IV.C should also be adopted for the Fifield/Cahill Ridge Trail. Those actions and measures would reduce soil erosion and slope instability impacts resulting from implementation of the Fifield/Cahill Ridge Trail project to a less than significant level.

D. HYDROLOGY AND WATER QUALITY

The program-level, impact-reducing actions identified in Sections III.D and IV.D should also be adopted for the Fifield/Cahill Ridge Trail. Those actions and policies would reduce water quality impacts associated with public use and new facilities. However, impacts would remain

potentially significant, and the following measures would be required to reduce impacts associated with Alternatives A and B. Although potential impacts associated with Alternatives C and D would be less than significant, Measure Number 1, below, is recommended to further reduce potential impacts.

1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. For all alternatives, construction of a new parking lot (such as at Skyline Quarry) or expansion of existing parking lots should incorporate on-site stormwater treatment and/or controls to reduce stormwater runoff from the parking lot to the Watershed. The parking lot design should minimize hydrologically impervious areas or use of gutters and curbs that concentrate and direct runoff. Designs should consider methods to encourage on-site percolation to reduce runoff. Possible on-site treatment methods include grassy swales or biofilters that could remove heavy metals and other toxics from the stormwater.
 2. The water quality monitoring program for the Fifiield/Cahill Ridge Trail should incorporate the following in areas identified as having high water quality vulnerability:
 - sampling locations, including upstream and downstream sites and/or control or background sites;
 - sampling parameters and protocol;
 - frequency of sampling;
 - consideration of background data, seasonal variation, and range of acceptable conditions;
 - criteria for interpreting sampling data, including rationale for threshold levels and associated quality control;
 - data management and reporting system; and
 - coordination with agencies and interested public citizens.
- If the monitoring program identifies areas where public access has resulted in substantial erosion or degradation of water quality, require trail closure (such as after wet weather events), restrict use, and/or repair the trail before restoring access.

These mitigation measures would reduce water quality impacts resulting from implementation of the Fifiield/Cahill Ridge Trail project to a less than significant level.

E. NATURAL RESOURCES

The program-level, impact-reducing actions identified in Sections III.E and IV.E should also be adopted for the Fifiield/Cahill Ridge Trail. Those actions would reduce potential impacts associated with construction activities and disturbance of nesting birds to a less than significant level. However, natural resource impacts would remain significant, and the following measures are recommended to further reduce impacts.

1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. Location of amenities. The location of amenities such as picnic areas, vista points, and restroom facilities should be in less-sensitive areas. All such facilities should be located several hundred yards from the Five Points area to reduce the attraction of Mud Dam Pond and Pilarcitos Reservoir.
2. Public Education Signs. “Sensitive habitat” signs would be installed in the Five Points area along the Fifield/Cahill Ridge Trail. The signs would inform recreationists of the endangered species habitat and that unauthorized passage into this area would be subject to penalties imposed by the SFPUC or under the Endangered Species Act by the United States Fish and Wildlife Service.
3. Butterfly Monitoring. The SFPUC would be required to implement a monitoring program for the habitats and foodplants of the four endangered and threatened butterflies. The monitoring program would be conducted in a manner to detect annual changes in the distribution and abundance of foodplants. Use the results of such monitoring, to determine when to temporarily fence stands of foodplants or exclude trail users from portions of the trail when the butterflies are active or using the foodplants.

These mitigation measures would reduce impacts to natural resources under Alternative D of the Fifield/Cahill Ridge Trail project to a less than significant level. However, if Alternative A, B, or C were chosen for development, the following mitigation measures would be required as well:

4. Times of Operation. Establish limited days (and hours) during which public access would be allowed. Assess the intensity of use and establish a carrying capacity based on any observed effects to natural resources. Use the carrying capacity to set future use thresholds that prevent significant impacts to natural resources.
5. Fencing. In the Five Points area, five- or six-strand fencing (using appropriate wire to protect deer and other wildlife), with locked gates across the service roads, would be constructed from the road intersections for several hundred yards on either side, well into the heavy brush.
6. Seasonal prohibitions. Institute seasonal prohibition and or restriction of activities. These seasonal prohibitions should be tailored to protect sensitive species and their habitat. For example, prohibitions would include the following:
 - Closure during high-risk fire hazard days (as described in the Management Plan).
 - In order to protect marbled murrelet critical habitat, restrict public use to docent-led access (under the terms of Alternative D) within or adjacent to critical habitat areas from May 15 to August 15.
7. User surveillance. Install 24-hour surveillance along the trail alignment at sensitive areas to control illegal off-trail use. Such surveillance may include the use of video and/or GPS technology.

These mitigation measures would reduce impacts to natural resources under Alternative C to a less than significant level. However, if Alternative A or B were chosen for development, these mitigations would not reduce impacts to a less than significant level because of the greater

potential for unauthorized use of Watershed lands. To reduce potential significant impacts under Alternatives A or B, the following mitigation measure would be required:

8. Work with resource agencies and the public to develop a program to protect sensitive species and monitor trail users. A funding mechanism, such as user fees, would be required to fund this program and the increase in staff required to support the effort. This program could include:
 - (a) Development of a habitat conservation plan to identify means of protecting the following species and enhancing their habitat: San Francisco garter snake, listed butterfly species, California red-legged frog, and marbled murrelet Critical Habitat. Also obtain an incidental take permit for species potentially affected under the habitat conservation plan. For a project lacking federal discretionary approval (such as Fifield/Cahill Ridge Trail) the incidental “taking” of endangered species would require a “10a” permit for federally protected organisms, and a “2081” permit for state-listed species.
 - (b) Development of a monitoring program to preclude unauthorized off trail use and other unauthorized activities. The monitoring program could place appropriate enforcement personnel at either end of the trail and at 2- to 3-mile intervals along the trail. Use of the trail could be conditional upon agreement to check in with these monitors at reasonable intervals (varied depending on skill level and travel mode [on foot, horseback, or bicycle]). Monitors would be connected (by phone or walkie-talkie), and identification would be required when users checked in.
 - (c) Development of an effective enforcement program to ensure that monitoring eliminates impacts to natural resources. An enforcement program would require cooperative agreements with San Mateo County for the prosecution of citations in cases brought by enforcement personnel. Substantial user fines or other penalties could be established for noncompliance with this mitigation (as with no smoking ordinances). If implementation of any of the trail alternatives results in construction of unauthorized trails, trail use could be further restricted, such as permanent limitation to docent-led access.

Implementation of these mitigation measures would reduce potential natural resource impacts from Alternatives A and B to a less than significant level. In the interim period while Alternatives A and B were being developed and approved, these alternatives could be implemented with a docent system similar to Alternative D.

F. AIR QUALITY

The program-level, impact-reducing actions identified in Sections III.F and IV.F should also be adopted for the Fifield/Cahill Ridge Trail. Those actions would reduce air quality impacts resulting from implementation of the Fifield/Cahill Ridge Trail project to a less than significant level.

G. FIRE MANAGEMENT

The program-level, impact-reducing actions identified in Sections III.G and IV.G should also be adopted for the Fifield/Cahill Ridge Trail. Those actions would reduce potential impacts associated with increased public use. However, impacts would remain potentially significant, and the following measure is recommended to further reduce impacts.

1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

1. Under alternatives A, B, and C, require fire protection activities commensurate with those of the Fire Management Plan, prior to increasing public access. Implementation of the Fire Management Plan prior to increasing public access could require implementing applicable fire management actions (i.e., installation of helispots) earlier than called for in the management plan phasing.
2. Under Alternatives B, C, and D, extensive forest management activities should be required in the cypress forest north of Skyline Quarry to remove fire hazards posed by dead tree limbs.

These mitigation measures would reduce the impacts associated with increased risk of fire under the Fifield/Cahill Ridge Trail project to a less than significant level.

H. CULTURAL RESOURCES

The program-level, impact-reducing actions and mitigation measures identified in Sections III.H and IV.H should also be adopted for the Fifield/Cahill Ridge Trail. Those actions, policies, and mitigation measures would reduce cultural resource impacts resulting from the construction and operation of the Fifield/Cahill Ridge Trail project to a less than significant level.

I. AESTHETICS

The program-level, impact-reducing actions identified in Sections III.I and IV.I should also be adopted for the Fifield/Cahill Ridge Trail. Those actions would reduce aesthetic resource impacts resulting from implementation of the Fifield/Cahill Ridge Trail project to a less than significant level.

J. TRANSPORTATION AND ACCESS

1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

The mitigation measure included in Section IV.J should also be adopted for the Fifield/Cahill Ridge Trail.

1. Under Alternative A, restrict parking time limit to two hours at the Vista Point area at the intersection of Skyline Boulevard / SR 92 in order to prevent trail users from parking at the Vista Point if the trail's parking area is fully occupied.

2. Under Alternative B, C or D, install “Side Road Ahead” warning signs in both directions on SR 92 at least 520 feet (minimum required sight distance) in advance of the access driveway to the Skyline Quarry staging area. A destination name plate could be added below the warning signs. Approval from Caltrans would be required for any such sign installation.
3. Under Alternative B, C, or D, restrict left turns from SR 92 into the staging area during peak-use times of the day, and direct people driving to the staging area to use I-280 to access SR 92 from the east (i.e., ending the inbound trip with a right turn into the staging area).
4. Under Alternatives A, B, or C reach agreement with local jurisdictions regarding signage and enforcement of parking restrictions.

These mitigation measures would reduce traffic safety impacts resulting from implementation of the Fifield/Cahill Ridge Trail project to a less than significant level.

K. UTILITIES AND PUBLIC SERVICES

No potentially significant or significant impacts have been identified, and no mitigation is required.

L. NOISE

1.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

The following measure would minimize noise related to public use under Alternative A:

1. Under Alternative A, the trail alignment through the existing Skylawn Memorial Park should avoid areas where gravesites are located or where funerals are held, in order to minimize the potential for noise disruption or disturbance of cemetery users. Adequate buffers and separation should be provided.

This mitigation measure would reduce noise impacts resulting from implementation of the Fifield/Cahill Ridge Trail project to a less than significant level. Mitigation is not required under Alternatives B, C, and D.

M. HAZARDOUS MATERIALS AND HAZARDOUS WASTE

The program-level, impact-reducing actions and mitigation measures identified in Sections III.D and IV.D should also be adopted for the Fifield/Cahill Ridge Trail. Those actions and measures would reduce potential impacts associated with facilities construction and existing hazards at the Skyline Quarry to a less than significant level.

N. ENERGY

No potentially significant or significant impacts have been identified, and no mitigation is required.

CHAPTER VII

SIGNIFICANT UNAVOIDABLE ENVIRONMENTAL EFFECTS

In accordance with Section 21067 of the California Environmental Quality Act (CEQA), and with Sections 15040, 15081, and 15082 of the CEQA Guidelines, the purpose of this chapter is to identify impacts that could not be eliminated or reduced to an insignificant level by mitigation measures included as part of the project, or by other mitigation measures that could be implemented, as described in Chapter IV, Mitigation Measures.

- This chapter was subject to final determination by the San Francisco Planning Commission as part of its certification process for the EIR.

For implementation of many proposed *Peninsula Watershed Management Plan* policies and management actions, their environmental effects are analyzed in sufficient detail to allow this EIR to fully satisfy CEQA. For example, the impacts of day-to-day management activities that implement the Management Plan are analyzed in this EIR and will generally not be subject to further environmental review. At a program-level, all potential significant impacts would be reduced to a less than significant level with implementation of mitigation measures listed in Chapter IV, Program-Level Mitigation Measures. However, implementation of certain management actions could require further environmental review at the time more specific projects are proposed. The San Francisco Planning Department will require examination of many specific management actions proposed in the Management Plan at the time they are proposed for implementation to determine if further environmental effects beyond those identified in the EIR would occur as a result of changes in the project or new circumstances or information, or if new mitigation measures or alternatives that would reduce one or more significant effects of the project are found to be feasible but SFPUC declines to adopt the measure or alternative (CEQA Guidelines Section 15162). Table II-1 identifies the specific management actions that are likely to require such study. At a project-level, all potential significant impacts would be reduced to a less than significant level with implementation of mitigation measures listed in Chapter VI, Fifield/Cahill Ridge Trail Mitigation Measures.

CHAPTER VIII

SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Implementation of the *Peninsula Watershed Management Plan* would result in short-term, construction-related impacts, impacts from increased operations and maintenance activities, and impacts associated with increased public access and use. These potential impacts are identified in Chapter III and Chapter V. If the mitigation measures identified in Chapter IV were approved and implemented along with the management actions that could result in physical effects, implementation of the Management Plan would not result in significant irreversible environmental impacts or commitment of resources. However, the commitment of land, resources, and energy for maintenance of the project facilities would be a long-term commitment. Once the project has been developed, it is unlikely that circumstances would arise that could justify the return of the land occupied by the Management Plan facilities to its original condition.

CHAPTER IX

WATERSHED MANAGEMENT ALTERNATIVES

A. METHODOLOGY

This alternatives analysis discusses the No Action Alternative and alternatives previously considered but rejected prior to preparation of the *Peninsula Watershed Management Plan* and this EIR. The California Environmental Quality Act (CEQA) Guidelines Section 15126.6(a) require EIRs to describe a range of reasonable alternatives to a project or its location that would attain the basic objectives of the project, but would avoid or reduce significant effects of the project, and to evaluate the comparative merits of the alternatives. The Guidelines set forth the following criteria for selecting alternatives:

1. . . . [T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. (§15126.6[b])
2. The range of potential alternatives shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. (§15126.6[c])
3. The specific alternative of “no project” shall also be evaluated along with its impact. (§15126.6[e][1])
4. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making. (§15126.6[f])

1.0 WATERSHED MANAGEMENT ALTERNATIVES SCREENING PROCESS

Prior to preparation of the *Peninsula Watershed Management Plan*, the SFPUC conducted an extensive analysis of data on water quality, natural resources, cultural resources, and fire hazard 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. These maps were considered together with public comments and public survey results to form three Watershed management alternatives. Alternative A provides for the highest improvement in water quality and emphasizes ecological resource protection and

enhancement. Public access is very limited under Alternative A. Alternative B provides for moderate improvement in water quality and balances ecological resource protection and public access and activity. Alternative C provides only a slight improvement in water quality and greatly emphasizes increased public access and activity. 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 most of the Alternative B components with some components of Alternative A. Alternatives A, B, and C are discussed below, and the preferred alternative is discussed in Chapters II, III, and IV of this EIR. Four alternatives were proposed for the Fifield/Cahill Ridge Trail project. These alternatives are referred to in this chapter, but are primarily discussed in Chapters V and VI of this EIR in conjunction with detailed analysis of the impacts of these trail alternatives. The range of alternatives considered for this analysis does not include an alternative to the location of the Management Plan, as the plan by definition is location-specific and its goals, plans, and policies cannot be shifted to an alternate location.

B. NO ACTION ALTERNATIVE

1.0 DESCRIPTION

Table IX-1 provides a comparison between the components of the preferred alternative and the No Action Alternative. Under the No Action Alternative, comprehensive Watershed management strategies would not be implemented, and the SFPUC would continue to use existing Watershed protection, operations, and maintenance policies. Public access to San Andreas Trail, Sawyer Camp Trail, Crystal Springs Trail, and the Crystal Springs Golf Course would likely increase in proportion to population growth and recreation demand. The SFPUC would maintain the current policy of restricted access to internal portions of the Watershed, but would consider new public-use trails on the fringe of the Watershed or trails that provide connectors to existing trails. Under the No Action Alternative, the current fire suppression policies and existing fuel management policy would be continued; all fires would be extinguished as soon as possible, and no specific direction would be provided regarding the means of fire suppression, beyond standard operating procedures followed by the fire suppression agency (CDF). Vegetation management for fire hazard reduction is permitted under the existing fuel management policies and has been utilized on the Watershed. The No Action Alternative could result in implementation of fuel management plans, using treatment methods that are allowed under existing fuel management policies. Under the No Action Alternative, the potential for ignitions related to trespassing and vandalism would continue.

Watershed patrols, operation of the Pulgas Water Temple, erosion control, sporadic treatment of non-native species and pests, and road maintenance would continue at existing levels and intensities. Management and use of Watershed lands for recreation within the Scenic and Recreation Easement would also continue at existing levels or as approved for future use. New facilities and improvements, such as new trails on Watershed fringes, could be constructed under the No Action Alternative. However, existing access restriction policies would result in fewer new facilities than under the preferred alternative. For example, under the No Action Alternative,

**TABLE IX-1
COMPARATIVE DESCRIPTION OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES**

Preferred Alternative	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C
<p>Watershed Management</p> <ul style="list-style-type: none"> ▪ Calls for water quality monitoring following baseline monitoring. ▪ Calls for ecological resource monitoring. ▪ Calls for greater fuel load reduction than Alternative A due to greater access. ▪ Calls for staff increase to support resource protection and access. Responsibilities focus on water quality and ecological resources protection, and fire management. ▪ Calls for establishment of operations and maintenance best management practices. 	<ul style="list-style-type: none"> ▪ Continue existing water quality monitoring. ▪ Continue existing resource monitoring. ▪ Continue existing fuel load reduction. ▪ No change in staffing. ▪ Continue existing operations and maintenance practices. 	<ul style="list-style-type: none"> ▪ Calls for least amount of water quality monitoring following baseline monitoring, due to limited access. Same as existing conditions. ▪ Calls for ecological resource monitoring to determine results of enhancement activity. Less than required for preferred alternative. ▪ Calls for considerable fuel load reduction, but the least of all alternatives. ▪ Calls for staff increase to support resource enhancement. Responsibilities focus on ecological resource enhancement and fire management. Less than required for preferred alternative. 	<ul style="list-style-type: none"> ▪ Calls for water quality monitoring following baseline monitoring. Similar to level required for preferred alternative. ▪ Calls for moderate ecological resource monitoring. Similar to level required for preferred alternative. ▪ Calls for greater fuel load reduction than Alternative A due to greater access. Similar to level required for preferred alternative. ▪ Calls for moderate staff increase to support resource protection and access. Responsibilities focus on water quality and ecological resources protection, and fire management. Similar to level required for preferred alternative. ▪ Calls for establishment of operations and maintenance best management practices. Similar to level required for preferred alternative. 	<ul style="list-style-type: none"> ▪ Calls for most frequent and intensive water quality monitoring to identify increased activity/human presence impacts, following baseline monitoring. ▪ Calls for high level resource monitoring to determine increased access impacts. ▪ Calls for greatest fuel load reduction to support increased access. ▪ Calls for greatest staff increase to support increased access. Responsibilities focus on security and policing, fire management, water quality and resources protection, monitoring and maintenance.
<p>Trails</p> <p>Existing Public Trails</p>	<ul style="list-style-type: none"> ▪ Open to individuals/groups without permit. 	<ul style="list-style-type: none"> ▪ Open to individuals/groups without permit. 	<ul style="list-style-type: none"> ▪ Open to individuals/groups without permit. 	<ul style="list-style-type: none"> ▪ Open to individuals/groups without permit.

TABLE IX-1 (Continued)
COMPARATIVE DESCRIPTION OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES

Preferred Alternative	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C
Trails (cont.)				
New Trails	<ul style="list-style-type: none"> ▪ New trails in lesser risk and vulnerability zones, priority given to connector trails and those adjacent to developed areas/Watershed boundaries. Open to individuals/groups without permit. 	<ul style="list-style-type: none"> ▪ Allows new designated and improved urban connector trails on the fringe of Watershed. Would be open to individuals/groups without permit. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ New trails in lesser risk and vulnerability zones, priority given to connector trails and those adjacent to developed areas/Watershed boundaries. Open to individuals/groups without permit. ▪ Consider new internal trails. Access to individuals/groups with permit.
Individual Access to Internal/Fire Roads	<ul style="list-style-type: none"> ▪ Plan alternatives range from unrestricted use of Ridge Trail to not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Individual access limited to selected existing internal roads with permit. ▪ Individual access limited to selected existing internal roads with permit.
Group Access to Internal/Fire Roads	<ul style="list-style-type: none"> ▪ Plan alternatives range from unrestricted use of Ridge Trail to docent-led groups of limited size. 	<ul style="list-style-type: none"> ▪ Permit required. ▪ Chartered groups only. ▪ Limited group size. 	<ul style="list-style-type: none"> ▪ Docent-/staff-led. ▪ Permit required. ▪ Chartered groups only. ▪ Limited group size. 	<ul style="list-style-type: none"> ▪ Docent-/staff-led. ▪ Permit required. ▪ Limited group size.
Equestrian Use	<ul style="list-style-type: none"> ▪ Plan alternatives range from unrestricted use of Ridge Trail and existing/new public trails to not allowed, except on existing/new public trails. 	<ul style="list-style-type: none"> ▪ Individual/group access. ▪ Access by permit only. ▪ Designated trails only. ▪ Limited group size. 	<ul style="list-style-type: none"> ▪ Not allowed except on existing public trails. 	<ul style="list-style-type: none"> ▪ Individual/group access. ▪ Access by permit only. ▪ Designated trails only. ▪ Limited group size.
Biking	<ul style="list-style-type: none"> ▪ Plan alternatives range from unrestricted use of Ridge Trail and existing/new trails to not allowed, except on existing/new public trails. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed except on existing public trails. ▪ Access by permit only. ▪ Limited to designated internal roads and trails in certain geographic areas. ▪ No off-trail use.
Fishing	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed. ▪ Controlled fishing considered with permit.

TABLE IX-1 (Continued)
COMPARATIVE DESCRIPTION OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES

Preferred Alternative	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C
Day Use and Environmental Education Centers	<ul style="list-style-type: none"> ▪ One Environmental Education Center. ▪ Docent-led activities. ▪ Day use only. ▪ Picnicking at designated sites only. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ Not allowed. 	<ul style="list-style-type: none"> ▪ One Environmental Education Center. ▪ Docent-led activities. ▪ Day use only. ▪ Picnicking at designated sites only. ▪ Consider limited overnight use for educational purposes.
Scientific Study	<ul style="list-style-type: none"> ▪ By permit only. 	<ul style="list-style-type: none"> ▪ By permit only. 	<ul style="list-style-type: none"> ▪ By permit only. 	<ul style="list-style-type: none"> ▪ By permit only.
Golf Courses	<ul style="list-style-type: none"> ▪ Retain existing course, expansion not permitted. 	<ul style="list-style-type: none"> ▪ Retain existing course. ▪ Consider expansion. ▪ Consider new courses. 	<ul style="list-style-type: none"> ▪ Retain existing course. ▪ No expansion. ▪ No new courses. 	<ul style="list-style-type: none"> ▪ Retain existing course. ▪ Consider expansion in areas of low vulnerability/sensitivity. ▪ No new courses upstream of reservoirs.
Other Activities and Uses	<ul style="list-style-type: none"> ▪ Policies to be developed for compatible activities/uses. 	<ul style="list-style-type: none"> ▪ None 	<ul style="list-style-type: none"> ▪ None 	<ul style="list-style-type: none"> ▪ Policies to be developed for compatible activities/uses. ▪ None

use of the Fifield/Cahill Ridge access road for recreational use would not occur and the Watershed Visitor Education Center would not be constructed.

2.0 IMPACTS AND REASONS FOR REJECTION

Table IX-2 provides a comparison between the impacts of the preferred alternative and the No Action Alternative. Without a Watershed Management Plan, the SFPUC would still be able to propose changes in Watershed management and propose new actions and projects. However, these would occur on an individual basis, without the encompassing policy framework that is provided by the Management Plan. Construction and operation of additional Watershed facilities could result in potential impacts, such as natural resource impacts during construction and increased sedimentation and water quality degradation associated with runoff from construction areas and impervious surfaces. Increased public use of the Watershed could result in an increase in unauthorized use that could in turn increase the risk and hazards associated with wildfires, habitat degradation, and water quality degradation. Under the existing fuel management policies, constraints to the fire protection system would remain, and the potential for catastrophic wildfire due to natural processes or illegal Watershed use would continue.

Implementation of actions and mitigation measures similar to those proposed under the preferred alternative 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 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, this alternative was rejected.

C. MANAGEMENT PLAN ALTERNATIVE A: ECOLOGICAL RESOURCE ENHANCEMENT

1.0 DESCRIPTION

Table IX-1 provides a comparison between the components of the preferred alternative and Alternative A. Alternative A would include management actions that provide for the greatest improvement in water quality. Alternative A emphasizes ecological resource protection and enhancement. Of the three alternatives, this alternative provides the lowest anticipated risk to public health and the highest level of ecological resource protection and enhancement. Alternative A provides for extensive fuel reduction and fire management activities. Due to the reduction in fuels and controlled public access, Alternative A poses the lowest risk of fire.

Public access compatible with Alternative A is relatively limited (similar to existing) and requires that water quality thresholds and screening criteria be met (as do all alternatives). Adherence to resource and activity management practices that control public use of the Watershed would be required to protect the resource base under this alternative, as well as under Alternatives B and C. Compatible activities include continued access to designated public trails, docent-led group

**TABLE IX-2
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS**

	Preferred Alternative^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C
Land Use	<ul style="list-style-type: none"> ▪ Increased access and new facilities would increase potential effects to Watershed lands as described below. 	<ul style="list-style-type: none"> ▪ The amount of new facilities and public access, and potential effects to Watershed lands, would be lower than under preferred alternative. 	<ul style="list-style-type: none"> ▪ The amount of new facilities and public access, and potential effects to Watershed lands, would be lower than under preferred alternative. 	<ul style="list-style-type: none"> ▪ Access and construction of new facilities, and potential effects to Watershed lands, would be similar to preferred alternative. 	<ul style="list-style-type: none"> ▪ High level of public use and new facilities would result in greater potential effects on Watershed lands than preferred alternative.
Geology and Soils	<ul style="list-style-type: none"> ▪ Construction of additional facilities would increase potential for erosion and landsliding. Actions to reduce soil erosion, and to identify, map, and reduce threats associated with landslides, would be implemented and would reduce impacts to a less than significant level. ▪ Increased access would increase the number of people potentially exposed to geologic hazards. Mitigation measures would reduce potential impacts to a less than significant level. 	<ul style="list-style-type: none"> ▪ If new facilities are constructed, erosion and landsliding potential would increase. Actions to reduce soil erosion, and to identify, map, and reduce threats associated with landslides, would not be implemented as part of a comprehensive plan. Actions could be proposed that would reduce potential impacts, similar to those proposed under the preferred plan. ▪ Continued access restriction would result in a lower number of people potentially exposed to geologic impacts than under preferred alternative. Mitigation measures could be proposed that would reduce potential impacts, similar to those proposed under the preferred plan. 	<ul style="list-style-type: none"> ▪ Limited construction of new facilities would result in less potential for erosion and landsliding than preferred alternative. Actions to identify, map, and reduce landslide impacts would be implemented. ▪ Continued access restriction would result in a lower number of people potentially exposed to geologic hazards than under preferred alternative. Mitigation measures could be proposed that would reduce potential impacts, similar to those proposed under the preferred plan. 	<ul style="list-style-type: none"> ▪ Public use allowed would be similar to preferred alternative and would result in similar potential for erosion and landsliding. Operations and maintenance BMPs would be implemented. BMPs could be less comprehensive than policies/actions of preferred alternative. ▪ The number of people potentially exposed to geologic hazards would be similar to preferred alternative. Mitigation measures could be proposed that would reduce potential impacts, similar to those proposed under the preferred plan. 	<ul style="list-style-type: none"> ▪ High level of public use and new facilities would result in greater potential for erosion and landsliding than preferred alternative. Would require high level of resource monitoring to reduce potential impacts due to high level of access/public use. ▪ High level of public use would result in highest numbers of people potentially exposed to geologic hazards. Mitigation measures could be proposed that would reduce potential impacts, similar to those proposed under the preferred plan.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C
Hydrology and Water Quality	<ul style="list-style-type: none"> ▪ New facilities construction could result in water quality impacts. Actions to maintain and improve water quality would be implemented. With these actions, impacts would be less than significant. ▪ Increased public use could result in water quality impacts. Actions to maintain and improve water quality would be implemented. With these actions, impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ If new facilities are constructed, water quality impacts could occur. Watershed management would continue under existing policies and could reduce potential impacts, but would not be conducted under a comprehensive plan. In addition, actions could be proposed that would reduce impacts, similar to those proposed under the preferred alternative. ▪ Restricted access would result in lower potential water quality impacts than preferred alternative. Watershed management would continue under existing policies and could reduce potential impacts, but would not be conducted under a comprehensive plan. In addition, actions could be proposed that would reduce impacts, similar to those proposed under the preferred alternative. 	<ul style="list-style-type: none"> ▪ Limited construction of new facilities would result in less potential for water quality impacts than preferred alternative. Actions to maintain and improve water quality would be implemented, similar to those proposed under the preferred alternative. However, level of effort required to reduce impacts would be less than under the preferred alternative. ▪ Restricted access would result in lower potential water quality impacts than preferred alternative. Actions to maintain and improve water quality would be implemented, similar to those proposed under the preferred alternative. However, level of effort required to reduce impacts would be less than under the preferred alternative. 	<ul style="list-style-type: none"> ▪ Construction of facilities and improvements would result in similar water quality impacts as preferred alternative. Actions to maintain and improve water quality would be implemented, similar to those proposed under the preferred alternative. ▪ Increased access would result in similar water quality impacts as preferred alternative. Actions to maintain and improve water quality would be implemented, similar to those proposed under the preferred alternative. ▪ Includes the greatest number of new facilities and improvements, resulting in the greatest potential water quality impacts. Actions to maintain and improve water quality would be implemented, similar to those proposed under the preferred alternative. However, level of effort required to reduce impacts would be greater than under the preferred alternative. ▪ Highest level of use would result in the greatest potential water quality impacts. Actions to maintain and improve water quality would be implemented, similar to those proposed under the preferred alternative. However, level of effort required to reduce impacts would be greater than under the preferred alternative.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C
Natural Resources	<ul style="list-style-type: none"> ▪ Construction of new facilities, improvements, and implementation of management actions could impact natural resources. Includes Integrated Pest Management, fuel management plan, and other resource management strategies that would reduce impacts to a less than significant level. ▪ Increased public access could impact natural resources. Includes actions and mitigation measures that would reduce potential impacts to a less than significant level. 	<ul style="list-style-type: none"> ▪ If new facilities are constructed, impacts to natural resources could occur. Pest management would continue under existing policies. Actions could be proposed that would reduce potential impacts, similar to those proposed under the preferred alternative. However, actions would not be conducted under a comprehensive plan. ▪ Public access would remain restricted; impacts to natural resources would be less than under preferred alternative. Actions may be proposed that would reduce potential impacts, similar to those proposed under the preferred alternative. However, actions would not be conducted under a comprehensive plan. 	<ul style="list-style-type: none"> ▪ Allows the least amount of new facilities and improvements that could impact natural resources. Calls for the greatest amount of resource enhancement. Actions that reduce potential impacts would be included, but would not be as extensive as under the preferred alternative. ▪ Allows the least amount of public access and the lowest impact to natural resources. Calls for the greatest amount of resource enhancement. Actions that reduce potential impacts would be included, but would not require as great an effort as under the preferred alternative. 	<ul style="list-style-type: none"> ▪ Would include similar improvements and facilities as preferred alternative. Actions would be proposed that reduce potential impacts, similar to those proposed under the preferred alternative. ▪ Public use allowed would be similar to preferred alternative and would result in similar impacts to natural resources. Actions would be proposed that reduce potential impacts, similar to those proposed under the preferred alternative. ▪ Highest level of public use would result in the greatest potential impact to natural resources. Calls for high level of resource monitoring, but includes less resource enhancement than preferred alternative. Actions and mitigation measures would be proposed that reduce potential impacts, similar to those proposed under the preferred alternative, but would require greater effort than under the preferred alternative.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C	
Air Quality	<ul style="list-style-type: none"> ▪ Construction of facilities and improvements would cause criteria pollutant and dust emissions. Actions that reduce potential impacts to a less than significant level would be imposed. ▪ Increased access would not result in significant emissions related to increased vehicle trips. 	<ul style="list-style-type: none"> ▪ If facilities/improvements are constructed, criteria pollutant and dust emissions would occur. Actions that reduce potential impacts could be proposed, similar to those proposed under the preferred alternative. However, implementation of actions and mitigation measures would not occur under a comprehensive plan. ▪ Public access would be less than under the preferred alternative. Therefore, potential operational impacts would not be significant. 	<ul style="list-style-type: none"> ▪ Allows the least amount of new facilities and resultant air quality impacts. Actions that reduce potential impacts to a less than significant level would be similar to those under the preferred alternative. However, the level of effort required would be less than under the preferred alternative. ▪ Public access would be less than under the preferred alternative. Therefore, potential operational impacts would not be significant. 	<ul style="list-style-type: none"> ▪ Construction of facilities and improvements would result in similar air quality impacts as preferred alternative. Actions that reduce potential impacts to a less than significant level would be similar to those under the preferred alternative. The level of effort required would be similar to that required under the preferred alternative. ▪ Increased access would be similar to preferred alternative. Therefore, this alternative would not result in significant emissions impacts. 	<ul style="list-style-type: none"> ▪ Increased facilities and improvement would result in greater air quality impacts than preferred alternative. Actions that reduce potential impacts to a less than significant level would be similar to the preferred alternative. However, the level of effort required would be greater than under the preferred alternative. ▪ Increased access would result in greater emissions than preferred alternative and would be potentially significant, depending on the level of increase in public use. Mitigation measures, such as alternative transportation programs, could be proposed.
Fire Management	<ul style="list-style-type: none"> ▪ Increased public use could result in increased potential for wildfire ignitions and hazards. Implementation of fuel management plan would reduce threat of wildfires. 	<ul style="list-style-type: none"> ▪ Restricted access would result in a lower potential of wildfire ignitions and hazards than preferred alternative. Actions that reduce potential impacts could be proposed, similar to those proposed under the preferred alternative. 	<ul style="list-style-type: none"> ▪ Restricted access would result in a lower potential of wildfire ignitions and hazards, and less extensive fuel management would be required than under preferred alternative. 	<ul style="list-style-type: none"> ▪ Public use allowed, and wildfire ignitions and hazards potential would be similar to those under preferred alternative. Implementation of fuel management plan would reduce threat of wildfires to same degree as preferred alternative. 	<ul style="list-style-type: none"> ▪ Increased public use would result in greater potential for wildfire ignitions and hazards than under preferred alternative. Fuel management would be more extensive than under preferred alternative.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C	
Fire Management (cont.)	However, implementation of actions would not occur under a comprehensive plan.				
Cultural Resources	<ul style="list-style-type: none"> ▪ Construction of new facilities could result in cultural resource impacts. Measures to protect cultural resources would be implemented that would reduce impacts to a less than significant level. ▪ Increased public access could result in damage to cultural resources. Measures to protect cultural resources would be implemented that would reduce impacts to a less than significant level. 	<ul style="list-style-type: none"> ▪ If new facilities are constructed, cultural resources could be impacted. Actions that reduce potential impacts could be proposed, similar to those proposed under the preferred alternative. However, implementation of actions would not occur under a comprehensive plan. ▪ Restricted access would result in less potential damage to cultural resources than preferred alternative. Actions that reduce potential impacts could be proposed, similar to those proposed under the preferred alternative. However, implementation of actions would not occur under a comprehensive plan. 	<ul style="list-style-type: none"> ▪ Construction of fewer new facilities would result in less potential for cultural resource impacts. Actions to protect cultural resources would be implemented. ▪ Restricted access would result in less potential damage to cultural resources than preferred alternative. Actions to protect cultural resources would be implemented. 	<ul style="list-style-type: none"> ▪ Construction of facilities would result in similar potential for cultural resource impacts as preferred alternative. Actions to protect cultural resources would be implemented. ▪ Public access allowed would result in similar potential for cultural resource damage as preferred alternative. Actions to protect cultural resources would be implemented. 	<ul style="list-style-type: none"> ▪ Includes the greatest number of new facilities, resulting in the greatest potential for cultural resource impacts. Actions to protect cultural resources would be implemented. ▪ Increased public access would result in greater potential for cultural resource damage than preferred alternative. Actions to protect cultural resources would be implemented.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C	
Aesthetics	<ul style="list-style-type: none"> ▪ New facilities and improvements would result in visual change. Management actions include design requirements for structures and landscaping. ▪ Increased access could result in increased litter and facilities damage. Implementation of management actions (Safety and Security and Visitor Education) would reduce impacts to less than significant. 	<ul style="list-style-type: none"> ▪ If new facilities and improvements are constructed, visual change would result. Actions similar to those included in the Management Plan could be implemented. However, implementation would not occur as part of a comprehensive plan. 	<ul style="list-style-type: none"> ▪ Allows the least amount of new facilities and would result in the lowest visual change. Design requirements would likely be included. ▪ Restricted access would result in lower potential for litter and damage than under preferred alternative. 	<ul style="list-style-type: none"> ▪ Visual change related to new facilities and improvements would be the same as under preferred alternative. Design requirements would likely be included. ▪ Public use and potential for litter and damage would be similar to preferred alternative. 	<ul style="list-style-type: none"> ▪ Allows the greatest increase in new facilities and improvements and would result in greater visual change than under preferred alternative. Design requirements would likely be included. ▪ Increased access would result in higher potential for litter and damage than under preferred alternative. Implementation of Safety and Security actions could be required to reduce potential impacts.
Transportation and Access	<ul style="list-style-type: none"> ▪ Increased access would result in a less than significant increase in vehicular traffic. ▪ Increased access could result in traffic safety hazards. Implementation of mitigation measures would be required that would reduce impacts to a less than significant level. 	<ul style="list-style-type: none"> ▪ Restricted access would increase traffic in proportion to local population and demand for recreation. ▪ Some increase in traffic safety hazards could occur. Implementation of similar mitigation measures as under the preferred alternative would reduce potential impacts. 	<ul style="list-style-type: none"> ▪ Restricted access would increase traffic in proportion to local population and demand for recreation. ▪ Some increase in traffic safety hazards could occur. Implementation of similar mitigation measures as under the preferred alternative would reduce potential impacts. 	<ul style="list-style-type: none"> ▪ Public use and increase in traffic would be similar to that under preferred alternative and would be less than significant. ▪ Increased access could result in traffic safety hazards similar to the preferred alternative. Implementation of mitigation measures similar to the preferred alternative would be required. 	<ul style="list-style-type: none"> ▪ Increased access would result in a greater increase in traffic than under preferred alternative and would be potentially significant, depending on the level of increase in public use. Mitigation measures, such as alternative transportation programs, could be proposed.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C	
Transportation and Access (cont.)				<ul style="list-style-type: none"> ▪ Increased access could result in traffic safety hazards greater than those the preferred alternative. Implementation of mitigation measures similar to the preferred alternative would be required. 	
Utilities and Public Services	<ul style="list-style-type: none"> ▪ Calls for infrastructure improvement and relocation, but would not result in potential utilities and public services impacts. 	<ul style="list-style-type: none"> ▪ Could result in infrastructure and relocation, but would not likely result in potential utilities and public services impacts due limited public access. 	<ul style="list-style-type: none"> ▪ Could result in infrastructure and relocation, but would not likely result in potential utilities and public services impacts due limited public access. 	<ul style="list-style-type: none"> ▪ Could result in infrastructure and relocation, similar to preferred alternative, but would not likely result in potential utilities and public services impacts. 	<ul style="list-style-type: none"> ▪ Could require greater infrastructure improvements than under the preferred alternative. If improvements are extensive, potentially significant impacts could result from construction and operation of the improvements. Mitigation would include standard construction and operation measures, as described in Chapter III of this EIR.
Noise	<ul style="list-style-type: none"> ▪ Construction of new facilities would result in noise increases. However, impacts would be less than significant. ▪ Increased public use would result in increased noise related to traffic and recreation use. However, impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ If new facilities and improvements are constructed, noise increases would result. However, impacts would be less than significant. ▪ Restricted access would result in lower potential for increased noise than under preferred alternative, and impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ Allows the least amount of new facilities, would result in the lowest construction noise increase, and would be less than significant. ▪ Restricted access would result in lower potential for increased noise than under preferred alternative, and impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ Construction of facilities and improvements would result in similar noise increases as preferred alternative and would be less than significant. ▪ Increased access would result in similar traffic and recreation noise as preferred alternative, and impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ Increased facilities and improvements would result in greater construction noise than preferred alternative. If impacts are potentially significant, mitigation measures would include use of noise-reducing construction equipment and placement of facilities away from sensitive land uses.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C	
Noise (cont.)					
				<ul style="list-style-type: none"> ▪ Increased access would result in greater traffic and recreation noise than preferred alternative. If found to be potentially significant, impacts would be reduced by placement of recreation opportunities away from sensitive land uses. 	
Hazardous Materials and Hazardous Waste	<ul style="list-style-type: none"> ▪ Construction of facilities and improvements could expose hazards. Implementation of mitigation measures would reduce impacts to less than significant. ▪ Increased access could result in greater use, storage, and dumping of hazardous materials, but would not result in potentially significant impacts. 	<ul style="list-style-type: none"> ▪ If new facilities construction occurs, hazards could be exposed. Implementation of mitigation measures similar to those proposed under preferred alternative would be required to reduce impacts to less than significant. ▪ Restricted access would result in lower hazardous materials impact potential than preferred alternative, and impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ Fewer new facilities would result in lower potential for hazards exposure than under preferred alternative. Implementation of mitigation measures similar to those proposed under preferred alternative would be required to reduce impacts to less than significant. ▪ Restricted access would result in lower hazardous materials impact potential than preferred alternative, and impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ New facilities construction and resultant potential for hazards exposure would be the same as under preferred alternative. Implementation of mitigation measures similar to those proposed under preferred alternative would be required to reduce impacts to less than significant. ▪ Public use and potential for hazardous materials impact would be similar to preferred alternative, but would not result in potentially significant impacts. 	<ul style="list-style-type: none"> ▪ Increased new facilities construction would result in greater potential for hazards exposure than under preferred alternative. Implementation of mitigation measures similar to those proposed under preferred alternative would be required to reduce impacts to less than significant. ▪ Increased access would result in greater hazardous materials impact potential than preferred alternative. Implementation of Safety and Security and Visitor Education actions would likely reduce impacts to a less than significant level.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

TABLE IX-2 (Continued)
COMPARISON OF IMPACTS OF PENINSULA WATERSHED MANAGEMENT PLAN ALTERNATIVES IMPACTS

Preferred Alternative ^a	No Action Alternative	Management Plan Alternative A	Management Plan Alternative B	Management Plan Alternative C	
Energy	<ul style="list-style-type: none"> ▪ Construction of facilities and improvements would increase energy consumption, but impacts would be less than significant. ▪ Increased access would result in increased vehicle trips and increased energy consumption, but impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ If facilities/improvements are constructed, energy consumption would occur, but impacts would be less than significant. ▪ Energy consumption would increase in proportion to local populations and demand for recreation, but would impacts be less than significant. 	<ul style="list-style-type: none"> ▪ Allows the least amount of new facilities and resultant energy impacts, but impacts would be less than significant. ▪ Retains restricted access; vehicle emissions would increase in proportion to local populations and demand for recreation, but impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ Construction of facilities and improvements would result in similar energy consumption as preferred alternative, and impacts would be less than significant. ▪ Public use and energy consumption would be similar to preferred alternative, and impacts would be less than significant. 	<ul style="list-style-type: none"> ▪ Increased facilities and improvement would result in greater energy consumption than preferred alternative, but impacts would be less than significant. ▪ Increased access would result in greater energy consumption than preferred alternative, but impacts would be less than significant.
Growth Inducement	<ul style="list-style-type: none"> ▪ Would not result in growth inducement. 	<ul style="list-style-type: none"> ▪ Would not result in growth inducement. 	<ul style="list-style-type: none"> ▪ Would not result in growth inducement. 	<ul style="list-style-type: none"> ▪ Would not result in growth inducement. 	<ul style="list-style-type: none"> ▪ Would not result in growth inducement.

^a Assumes that the Fifield/Cahill Ridge Trail alternative selected would result in a moderate increase in access permitted. Alternatives that allow high levels of use would generally result in higher impacts (similar to Alternative C), while alternatives that allow lower levels of access would generally result in lower impacts (similar to Alternative A).

access by permit, and access by permit for scientific study. The existing golf course would remain. Activities considered incompatible with Alternative A include equestrian access, new or expanded golf courses, additional trails, educational centers, fishing, and biking. Revenue-generating activities are not considered compatible with Alternative A.

2.0 IMPACTS AND REASONS FOR REJECTION

Table IX-2 provides a comparison between the impacts of the preferred alternative and Alternative A. Alternative A would result in the lowest level of public access; therefore, it would result in the lowest level of impacts related to construction of new or upgraded facilities and increased public use. Construction and operation of additional Watershed facilities could result in limited impacts, such as natural resource impacts during construction and increased sedimentation and water quality degradation associated with runoff from construction areas and impervious surfaces. Increased public use of the Watershed could result in a limited increase in unauthorized use that could in turn increase the risk and hazards associated with wildfires and water quality degradation. Alternative A would include actions and mitigation measures similar to those associated with the preferred alternative that would reduce potential impacts to a less than significant level.

Alternative A would provide comprehensive Watershed management strategies for water quality, fuels management, and other Watershed resources. Alternative A would also result in extensive natural resource enhancement activities. Alternative A would require a lower level of fuel reduction due to limited public access. Alternative A is the environmentally superior alternative.

Both the preferred alternative and Alternative A would meet all of the Watershed management goals. Although Alternative A is the environmentally superior alternative, Alternative A was rejected because it does not continue existing compatible uses and provide opportunities for potential compatible uses on Watershed lands, including educational, recreational, and scientific uses to the same degree as under the Management Plan preferred alternative.

D. MANAGEMENT PLAN ALTERNATIVE B: ECOLOGICAL RESOURCE/ACCESS

1.0 DESCRIPTION

Table IX-1 provides a comparison between the components of the preferred alternative and Alternative B. Alternative B would include management actions that provide moderate improvement in water quality. Alternative B seeks to balance ecological resource protection and public access and activity. Alternative B stresses management procedures and monitoring that would result in prudent Watershed resource management, especially in the areas of water quality protection, ecological resource protection, and reduced fire hazard. The anticipated risk to water quality under this alternative due to public access is greater than under Alternative A but less than under Alternative C. This alternative would provide for many of the ecological resource enhancement practices identified in Alternative A, but they would be less extensive and intensive.

Alternative B provides a greater reduction in the amount of fuels than under Alternative A. Following reduction of hazardous fuels, this alternative presents a greater risk of fire due to greater public access than under Alternative A.

Public access compatible with Alternative B is somewhat limited, and all activities must meet water quality thresholds and screening criteria, as is required for all alternatives. Compatible activities include continued access to designated public trails, additional urban connector trails, (accessible without a permit), group equestrian access by permit, docent-led group access by permit, access by permit for scientific study, and day-use educational centers. The existing golf course could be expanded, subject to water quality and monitoring requirements. Activities considered incompatible with Alternative B include new golf courses, additional interior trail access, fishing, and biking. Revenue-generating activities, beyond those associated with the golf course, are not considered compatible with Alternative B.

2.0 IMPACTS AND REASONS FOR REJECTION

Table IX-2 provides a comparison between the impacts of the preferred alternative and Alternative B. Alternative B is essentially the same as the preferred alternative, except for the inclusion of the Fifield/Cahill Ridge Trail project under the preferred alternative and possible expansion of the existing golf course under Alternative B. The preferred alternative and Alternative B allow similar Watershed management activities and public use and would include most of the same facilities and improvements. Construction and operation of additional Watershed facilities could result in potential impacts, such as natural resource impacts during construction and increased sedimentation and water quality degradation associated with runoff from construction areas and impervious surfaces. Increased public use of the Watershed could result in an increase in unauthorized use that could in turn increase the risk and hazards associated with wildfires, habitat degradation, and water quality degradation. Alternative B would include actions and mitigation measures similar to those associated with the preferred alternative that would reduce potential impacts to a less than significant level.

Alternative B would have only a moderate response to the primary goal and most of the secondary goals of the Watershed Plan. Alternative B has not been rejected, but has been modified to increase responsiveness to the Watershed management goals, provide a range of access alternatives for existing internal roads, and to reject the proposed golf course expansion.

E. MANAGEMENT PLAN ALTERNATIVE C: INCREASED ACTIVITIES

1.0 DESCRIPTION

Table IX-1 provides a comparison between the components of the preferred alternative and Alternative C. Alternative C would include management actions that provide a slight improvement in water quality. Alternative C emphasizes increased public access and activity. Of the three alternatives, Alternative C poses the greatest risk of public access effects on water

quality and would require the most frequent and intensive water quality monitoring to evaluate the impacts of use on water quality. Alternative C accommodates some of the ecological resource enhancement activities identified in Alternative A, but they would be limited in scope and focused on the protection of areas vulnerable to damage by the public. This alternative requires the highest level of fire management and fuel reduction of the three alternatives in order to safely accommodate increased access. Following fuel reduction, this alternative would still have the highest risk of fire due to increased public access. Alternative C would require the greatest level of management in terms of security and maintenance.

Public access compatible with Alternative C requires that screening criteria and water quality thresholds be met and would be subject to resource and activity management practices, as is required under all alternatives. Potential compatible activities include continued access to designated public trails and new urban connector trails, access to additional portions of the Watershed (by permit) for hiking and equestrian use, access by permit for scientific study, overnight educational centers, new or expanded golf courses, shooting ranges, and controlled fishing and biking by permit. Revenue-generating activities, excluding golf course expansion or a new golf course, are not considered compatible with Alternative C.

2.0 IMPACTS AND REASONS FOR REJECTION

Table IX-2 provides a comparison between the impacts of the preferred alternative and Alternative C. Alternative C would provide the highest level of public use and access, resulting in the greatest number of new facilities and improvements, and thus would have the greatest effect on water quality and watershed resources. Alternative C would require the greatest level of management activities, fuel reduction, and staffing to reduce the effects of public use on the Watershed. Construction and operation of additional Watershed facilities could result in potential impacts, such as natural resource impacts during construction and increased sedimentation and water quality degradation associated with runoff from construction areas and impervious surfaces. Increased public use of the Watershed could result in an increase in unauthorized use that could in turn increase the risk and hazards associated with wildfires, habitat degradation, and water quality degradation.

Construction and operation of a new golf course within the Watershed boundaries would increase the area of impervious surfaces (by about 8 to 12 acres) and thereby increase the volume of runoff, increase the use and storage of chemicals for golf course maintenance, and introduce utilities, sewers, and other services to the Watershed. It would also involve temporary construction activities including earthmoving and grading that could lead to erosion and sedimentation to water bodies. Increasing the recreational use of the Watershed by construction of a second golf course could require removal and fragmentation of sensitive habitat currently occupied by special status species. In addition, construction and operation of a new golf course could result in significant hazardous materials, noise, traffic, aesthetic resources, and cultural resources impacts.

Alternative C would include actions and mitigation measures similar to those associated with the preferred alternative that would reduce potential impacts. However, given the extensive level of

public use under this alternative, potential water quality, fire hazard, and natural resource 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, 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 was rejected.

CHAPTER X

DRAFT EIR DISTRIBUTION LIST

CHAPTER XI

APPENDICES

APPENDIX XI.A

NOTICE OF PREPARATION

APPENDIX XI.B
SPECIAL-STATUS SPECIES TABLES

**TABLE XI.B-1
SPECIAL-STATUS PLANT SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Flowering Period
San Mateo thorn-mint <i>Acanthomintha duttonii</i>	FE/CE/1B	Grassland and chaparral, on serpentinite	Found in “Triangle” ^{a,b}	<i>Low Potential^c</i>	April-June
Coast rock cress <i>Arabis blepharophylla</i>	FC3c/--/4	Broadleaved upland forests, coastal prairie, coastal scrub; often in rocky places	Found ^{b,d}	Observed ^c	February- April
San Bruno Mtn. Manzanita <i>Arctostaphylos imbricata</i>	FSC/CE/1B	Chaparral, Coastal scrub	Found ^{b,d}	Low Potential ^c	February- May
Montara manzanita <i>Arctostaphylos montaraensis</i>	FC/--/1B	Maritime chaparral, coastal scrub	Found ^{a,b}	Low Potential ^c	January- March
Kings Mtn. Manzanita <i>Arctostaphylos regismontana</i>	--/--/4	Chaparral, conifer forests	Low Potential ^c	Low Potential ^c	January- April
Brewer’s calandrinia <i>Calandrinia breweri</i>	--/--/4	Burns and disturbed areas in coastal scrub and chaparral	Moderate Potential ^c	Moderate Potential ^c	March-June
Oakland star-tulip <i>Calochortus umbellatus</i>	--/--/4	Broadleaved upland forests, chaparral, lower montane coniferous forests, grasslands, often on serpentinite	Low Potential ^c	Low Potential ^c	March-May
San Francisco Bay spineflower <i>Chorizanthe cuspidata var. cuspidata</i>	FSC/--/1B	Coastal bluff scrub, coastal dunes, coastal prairie, on sandy soils	Low Potential ^c	Low Potential ^c	April-July
Robust spineflower <i>Chorizanthe robusta var. robusta</i>	FPE/--/1B	Coastal scrub, coastal dunes, openings in oak woodlands	Moderate Potential ^c	Moderate Potential ^c	May- September
Franciscan thistle <i>Cirsium andrewsii</i>	--/--/4	Broadleaved upland forests, coastal bluff scrub, sometimes on serpentinite	Low Potential ^c	Low Potential ^c	June-July
Fountain thistle <i>Cirsium fontinale var. fontinale</i>	FE/CE/1B	Grassland and openings in chaparral, in serpentinite seeps	Found on Pulgas Ridge ^b	Low Potential ^c	June- October
● San Francisco collinsia <i>Collinsia multicolor</i>	--/--/4	Closed-cone coniferous forests, coastal scrub, and moist, shady coast live oak woodland	High Potential ^g	Low Potential ^c	March-May

TABLE XI.B-1 (Continued)
SPECIAL-STATUS PLANT SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Flowering Period
Clustered lady's-slipper <i>Cypripedium fasciculatum</i>	FSC/--/4	Lower montane coniferous forests, North coast coniferous forests, usually serpentinite seeps and streambanks	Low Potential ^c	Low Potential ^c	March-July
Mountain lady's-slipper <i>Cypripedium montanum</i>	FC3c/--/4	Broadleafed upland forests, lower montane coniferous forests	Moderate Potential ^c	Moderate Potential ^c	March-July
Western leatherwood <i>Dirca occidentalis</i>	--/--/1B	Broadleafed upland forests, closed-cone coniferous forests, chaparral, cismontane woodland, North coast coniferous forests, riparian forests, riparian woodland; mesic sites	Found in many communities ^e	Observed occasionally in coastal scrub ^c	January-April
California bottle-brush grass <i>Elymus californicus</i>	FC3c/--/4	North coast coniferous forests	Occurs on Cahill Ridge ^{b,c}	Occurs on Cahill Ridge ^c	June-August
Marsh horsetail <i>Equisetum palustre</i>	--/--/3	Marshes	Moderate Potential ^c	Moderate Potential ^c	NK
Tiburon buckwheat <i>Eriogonum luteolum</i> var. <i>caninum</i>	FC3c/--/3	Chaparral, coastal prairie, grasslands, usually on serpentinite	High Potential ^c observed in coastal scrub	Observed in coastal scrub ^c	June-September
San Mateo woolly sunflower <i>Eriophyllum latilobum</i>	FE/CE/1B	Cismontane woodland, on serpentinite, often on roadcuts	Found along Crystal Sps. Rd. ^{a,b,f}	Low Potential ^c	May-June
San Francisco wallflower <i>Erysimum franciscanum</i>	FSC/--/4	Coastal dunes, coastal scrub, grasslands, often on serpentinite or granitic soils	Found throughout grassland ^b	Common on cleared coastal scrub roadsides ^c	March-June
Stink bells <i>Fritillaria agrestis</i>	--/--/4	Valley and foothill grasslands, oak woodlands; on clay flats; sometimes on serpentinite	Low-Moderate Potential ^c	Low-Moderate Potential ^c	March-April
● Hillsborough chocolate lily <i>Fritillaria biflora</i> var. <i>ineziana</i>	--/--/1B	Cismontane woodland, grassland, on serpentinite	Found on Buri Buri Ridge in serpentine grassland ^g	Low Potential ^c	March-April

**TABLE XI.B-1 (Continued)
SPECIAL-STATUS PLANT SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Flowering Period
Fragrant fritillary <i>Fritillaria liliacea</i>	FSC/--/1B	Coastal scrub, valley and foothill grassland, coastal prairie; on heavy clay soils, often on ultramafic soils	Found on Pulgas Ridge ^b	Low Potential ^c	February-April
● San Francisco gumplant <i>Grindelia hirsutula var. maritima</i>	FSC/--/1B	Coastal bluff scrub, coastal scrub, grasslands, on sandy or serpentinite soils	High Potential ^g	Low Potential ^c	August-September
Diablo rock-rose <i>Helianthella castanea</i>	FSC/--/1B	Openings in chaparral and broadleaved upland forest	Low-moderate ^c Potential	Low-moderate ^c Potential	April-June
Marin dwarf flax <i>Hesperolinon congestum</i>	FT/CT/1B	Grassland and openings in chaparral, often on serpentinite	Found on Pulgas and BuriBuri ridges ^b	Low Potential ^c	May-July
Kellogg's horkelia <i>Horkelia cuneata ssp. sericea</i>	FSC/--/1B	Closed-cone coniferous forests, coastal scrub	Low-Moderate Potential ^c	Low-Moderate Potential ^c	April-September
● Crystal Springs lessingia <i>Lessingia arachnoidea</i>	FSC/--/1B	Cismontane woodland, coastal scrub, grasslands, on serpentinite, often on roadcuts	Found on Pulgas Ridge ^{g,h}	Low Potential ^c	July-October
Woolly-headed lessingia <i>Lessingia hololeuca</i>	--/--/3	Coastal scrub, lower montane coniferous forests, grasslands, usually on clay or serpentinite	Low Potential ^c	Low Potential ^c	June-October
Bristly linanthus <i>Linanthus acicularis</i>	--/--/4	Chaparral, Cismontane woodland, coastal prairie	Low-Moderate Potential ^c	Low-Moderate Potential ^c	April-July
● Serpentine linanthus <i>Linanthus ambiguus</i>	--/--/4	Cismontane woodland, coastal scrub, grassland, usually on serpentinite	High Potential ^g	Low Potential ^c	March-June
Large-flower linanthus <i>Linanthus grandiflorus</i>	--/--/4	Coastal bluff scrub, closed-cone coniferous forests, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, grasslands	Low-Moderate Potential ^c	Low-Moderate Potential ^c	April-July

TABLE XI.B-1 (Continued)
SPECIAL-STATUS PLANT SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Flowering Period
San Mateo tree lupine <i>Lupinus eximius</i>	FSC/--/3	Chaparral and coastal	Found ^b	Low-Moderate Potential ^c	April-July
Arcuate bush mallow <i>Malacothamnus arcuatus</i>	--/--/4	Chaparral	Found ^c	Low-Moderate Potential ^c	April-July
Robust monardella <i>Monardella villosa</i> ssp. <i>globosa</i>	--/--/1B	Cismontane woodland, openings in chaparral	Low Potential ^c	Low Potential ^c	June-July
Dudley's lousewort <i>Pedicularia dudleyi</i>	FSC/CR/1B	North Coast coniferous forests, maritime chaparral, grasslands, sometimes in disturbed sites	High Potential ^c	Low Potential ^c	April-June
● White-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE/CE/1B	Grasslands, serpentinite soils, dry rocky slopes	Found in triangle area ^c	Low Potential ^c	March-May
Gaairdner's yampah <i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	FSC/--/4	Broadleafed upland forests, chaparral, grasslands, vernal pools, usually in mesic sites	Moderate Potential ^c	Moderate Potential ^c	June- October
White-flowered rein orchid <i>Piperia candida</i>	--/--/4	Lower montane coniferous forests, North Coast coniferous forests, sometimes on serpentinite	Low Potential ^c	Low Potential ^c	May- August
Michael's rein orchid <i>Piperia michaelii</i>	--/--/4	Coastal bluff scrub, closed-cone coniferous forests, cismontane woodland, lower montane coniferous forests	Low Potential ^c	Low Potential ^c	May- August
Choris's popcorn-flower <i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	--/--/3	Chaparral, coastal prairie, coastal scrub, on mesic sites	Moderate Potential ^c	Moderate Potential ^c	April-June
● Hickman's cinquefoil <i>Potentilla hickmanii</i>	FPE/CE/1B	Coastal bluff scrub, closed-cone coniferous forests, meadows and marshes, mesic sites	High Potential ^g	Moderate Potential ^c	April- August
Hoffman's sanicle <i>Sanicula hoffmannii</i>	FC3c/--/4	Broadleafed upland forests, chaparral, coastal scrub, often on serpentinite or clay	Low Potential ^c	Low potential ^c	March-May

**TABLE XI.B-1 (Continued)
SPECIAL-STATUS PLANT SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY**

Common name <i>Scientific name</i>	Listing Status FWS/DFG/ CNPS	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Flowering Period
Marin checkerbloom <i>Sidalcea hickmanii</i> ssp. <i>viridis</i>	FSC/--/1B	Chaparral, usually on serpentine	Low Potential ^c	Low potential ^c	May-June
San Francisco campion <i>Silene verecunda</i> ssp. <i>verecunda</i>	FSC/--/1B	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, grasslands	Low Potential ^c	Low Potential ^c	March-June
San Francisco owl's-clover <i>Triphysaria floribunda</i>	FSC/--/1B	Coastal prairie and grasslands, on serpentine	Low Potential ^c	Low Potential ^c	April-May

● Federal Categories (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government
 FT = Listed as Threatened by the Federal Government
 FPE = Proposed for Listing as Endangered
 FPT = Proposed for Listing as Threatened
 FC = Candidate for Federal Listing
 FSC = Federal Species of Concern (former Category 2 Candidate)
 FC3c = Species removed from listing

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California
 List 1B = Plants rare, threatened, or endangered in California and elsewhere
 List 2 = Plants rare, threatened, or endangered in California but more common
 List 3 = Plants about which more information is needed
 List 4 = Plants of limited distribution

State Categories (California Department of Fish and Game)

CE = Listed as Endangered by the State of California
 CT = Listed as Threatened by the State of California
 CR = Listed as Rare by the State of California

- a CDFG, 1998.
- b Corelli, T., 1991.
- c Environmental Science Associates, 1998a.
- d Environmental Science Associates, 1994.
- e Oberlander, G. T., 1953.
- f The Nature Conservancy, 1990.
- g California Native Plant Society, 2000.
- h National Park Service, 2000.

High Potential = Species expected to occur and meets all habitats as defined in list.
 Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
 Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.
 -- = No listing status; NK = Not known, information unavailable.

SOURCE: Environmental Science Associates, 1994, 1998; CDFG, 1998; CNPS, 1998

**TABLE XI.B-2
SPECIAL-STATUS ANIMAL SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY**

Common name Scientific name	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Period of Identification
<u>Invertebrates</u>					
Ricksecker's water scavenger beetle <i>Hydrochara rickseckeri</i>	FSC/--	Found in freshwater ponds, shallow water of streams marshes and lakes	Low Potential	Low Potential	January-July
Leech's skyline diving beetle <i>Hydroporus leechi</i>	FSC/--	Found in freshwater ponds, shallow water of streams marshes and lakes	Low Potential	Low Potential	January-July
Curved-foot hygrotus diving beetle <i>Hygrotus curvipes</i>	FSC/--	Found in vernal pools and alkali flats	Low Potential	Low Potential	January-July
Opler's longhorn moth <i>Adella oplerella</i>	FSC/--	Serpentine bunchgrass grassland	High Potential	High Potential	Spring
Edgewood blind harvestman <i>Calcinia minor</i>	FSC/--	Serpentine rock outcrops and barrens	High Potential	Moderate Potential	Fall-Winter
Serpentine phalangid <i>Calcina serpentina</i>	FSC/--	Serpentine rocks and barrens	High Potential	Moderate Potential	Fall-Winter
Monarch butterfly <i>Danaus plexippus</i>	--/*	Eucalyptus groves (winter sites)	Moderate Potential	Low Potential	Winter
Bay checkerspot butterfly <i>Euphydryas editha bayensis</i>	FT/--	serpentine bunchgrass grassland	High Potential	Habitat occurs on Fifield Ridge	March-May
Mission blue butterfly <i>Icaricia icarioides missionensis</i>	FE/--	Grassland with <i>Lupinus albifrons</i> , <i>L. formosa</i> , and <i>L. varicolor</i>	High Potential	Moderate Potential	March-June
San Bruno elfin butterfly <i>Incisalia mossii bayensis</i>	FE/--	Found in coastal scrub	High Potential	High Potential	March-April
San Francisco forked-tailed damselfly <i>Ischnura gemina</i>	FSC/--	Wetlands with emergent vegetation	High Potential	High Potential	April-October
San Francisco lacewing <i>Nothochrysa californica</i>	FSC/--	Grasslands	Moderate Potential	Moderate Potential	Spring
Unsilvered fritillary butterfly <i>Speyeria adiastrae adiastrae</i>	FSC/--	Found in native grasslands with <i>Viola pedunculata</i> as larval food plant	High Potential	High Potential	Spring

TABLE XI.B-2 (Continued)
SPECIAL-STATUS ANIMAL SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Period of Identification
<u>Invertebrates (cont.)</u>					
Callipe silverspot butterfly <i>Speyeria callippe callippe</i>	FE/--	Found in native grasslands with <i>Viola pedunculata</i> as larval food plant	High Potential	Low Potential	Spring
Myrtle silverspot butterfly <i>Speyeria zerene myrtleae</i>	FE/--	Found in native grasslands with <i>Viola pedunculata</i> as larval food plant	High Potential	Low Potential	Spring
<u>Amphibians</u>					
California tiger salamander <i>Ambystoma californiense</i>	FC/CSC	Seasonal freshwater ponds with little or no emergent vegetation	Moderate Potential	Low Potential	November-May
California red-legged frog <i>Rana aurora draytonii</i>	FT/CSC	Freshwater ponds and slow streams with emergent vegetation for egg attachment	High Potential	Moderate Potential	April-June
Foothill yellow-legged frog <i>Rana boylei</i>	FSC/CSC	Streams with quiet pools absent of predatory fish	High Potential	Low Potential	April-June
Western spadefoot toad <i>Scaphiopus hammondi</i>	FSC/CSC	Floodplains and grassland pools	Moderate Potential	Low Potential	February-August
<u>Reptiles</u>					
Western pond turtle <i>Clemmys marmorata</i>	FSC/CSC	Freshwater ponds and slow streams edged with sandy soils for laying eggs	High Potential	Low Potential	warm days
California horned lizard <i>Phrynosoma coronatum frontale</i>	FSC/CSC	Patchy open areas with sandy soils	Low Potential	Low Potential	Year-round
San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i>	FE/CE	Freshwater ponds and slow streams with emergent vegetation	High Potential	High Potential	warm days
<u>Birds</u>					
Cooper's hawk <i>Accipiter cooperi</i>	--/CSC	Nests in riparian growths of deciduous trees and live in oaks	High Potential	High Potential	March-July

TABLE XI.B-2 (Continued)
SPECIAL-STATUS ANIMAL SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Period of Identification
Birds (cont.)					
Sharp-shinned hawk <i>Accipiter striatus</i>	--/CSC	Nests in riparian growths of deciduous trees and live oaks	High Potential	High Potential	March-July
Great blue heron <i>Ardea herodias</i>	--/*	Nests in trees along lakes and estuaries	High Potential	Low Potential	Dec.-July
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT/CE	Nests in dense, old growth forests along coast	High Potential	High Potential	Year-round
Northern harrier <i>Circus cyaneus</i>	--/CSC	Nests and forages in wet meadows and pastures	High Potential	Low Potential	Year-round
White-tailed kite <i>Elanus leucurus</i>	--/3511	<i>Nests near wet meadows and open grasslands with trees</i>	Low Potential	Low Potential	March-July
California horned lark <i>Eremophila alpestris actia</i>	--/CSC	Open grasslands and irrigated pastures	Low Potential	Low Potential	Year-round
Merlin <i>Falco columbarius</i>	--/CSC	A winter visitor of woodlands, foothills and valleys	High Potential	High Potential	Winter
● American peregrine falcon <i>Falco peregrinus anatum</i>	--/CE	Nests in cliffs and outcrops	Moderate Potential	Low Potential	Year-round
Saltmarsh common yellowthroat <i>Geothlypic trichas sinuosa</i>	FSC/CSC	Saline and freshwater marshes	Low Potential	Low Potential	Year-round
Bald eagle ^a <i>Haliaeetus leucocephalus</i>	FT/CE	Nests and forages on inland lakes, reservoirs, and rivers	High Potential	Low Potential	Winter
Loggerhead shrike <i>Lanius ludovicianus</i>	FSC/CSC	Nests in shrublands and forages in open grasslands	Low Potential	Low Potential	March-Sept.
Osprey <i>Pandion haliaetus</i>	--/CSC	Nests near fresh water lakes and large streams on large snags	Moderate Potential	Moderate Potential	March-June
American white pelican <i>Pelecanus erythrorhynchos</i>	--/CSC	Nests on protected islets near freshwater lakes for protection from predators	Moderate Potential	Low Potential	May-July

**TABLE XI.B-2 (Continued)
SPECIAL-STATUS ANIMAL SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY**

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Period of Identification
<u>Birds (cont.)</u>					
Northern spotted owl <i>Strix occidentalis caurina</i>	FT/--	Nests in old growth forests	Low Potential	Low Potential	Year-round
California spotted owl <i>Strix occidentalis occidentalis</i>	FSC/CSC	Nests in old growth forests	Low Potential	Low Potential	March-Sept.
<u>Mammals</u>					
Pallid bat <i>Antrozous pallidus</i>	--/CSC	Roosts in caves, old buildings and under bark. Forages in open lowland areas and forms large maternity colonies in spring.	High Potential	High Potential	February-August
Western mastiff bat <i>Eumops perotis</i>	FSC/CSC	Open semi-arid to arid habitats roosting on high cliffs and buildings	High Potential	High Potential	February-August
Small-footed myotis <i>Myotis ciliolabrum</i>	FSC/--	Roosts in caves, old buildings and under bark	High Potential	High Potential	February-August
Long-eared myotis <i>Myotis evotis</i>	FSC/--	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring	High Potential	High Potential	February-August
Fringed myotis <i>Myotis thysanodes</i>	FSC/--	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring	High Potential	High Potential	February-August
Long-legged myotis <i>Myotis volans</i>	FSC/--	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring.	High Potential	High Potential	February-August
Townsend's big-eared bat <i>Plecotus townsendii</i>	FSC/CSC	Roosts in caves, old buildings and under bark. Forages in open lowland areas and forms large maternity colonies in spring.	Moderate Potential	Moderate Potential	February-August
Ringtail <i>Bassariscus astutus</i>	--/3511	Brushy and woody watercourses	Low Potential	Low Potential	Year-round
Badger <i>Taxidea taxus</i>	--/*	Open grasslands with loose, friable soils	Moderate Potential	Moderate Potential	Year-round

TABLE XI.B-2 (Continued)
SPECIAL-STATUS ANIMAL SPECIES
POTENTIALLY OCCURRING IN THE PENINSULA WATERSHED VICINITY

Common name <i>Scientific name</i>	Listing Status USFWS/ CDFG	Habitat Requirements	Potential for Occurrence Within the Watershed	Potential for Occurrence along the Ridge Trail Route	Period of Identification
<u>Mammals (cont.)</u>					
Mountain lion <i>Felis spp.</i>	--/4800	Rural grasslands and woodlands	High	High	Year-round
<u>Fish</u>					
Steelhead trout <i>Oncorhynchus mykiss</i>	FT/--	Freshwater streams	High Potential	None	Year-round

Federal Categories (USFWS)

FE = Listed as Endangered (in danger of extinction) by the Federal Government.
 FT = Listed as Threatened (likely to become endangered within the foreseeable future) by the Federal Government.
 FPE = Proposed for Listing as Endangered
 FPT = Proposed for Listing as Threatened
 FC = Candidate to become a *proposed* species.
 FSC = Federal Species of Concern. May be endangered or threatened, but not enough biological information has been gathered to support listing at this time.
 FC3c = Species removed from listing

State Categories (CDFG)

CE = Listed as Endangered by the State of California
 CT = Listed as Threatened by the State of California
 CR = Listed as Rare by the State of California (plants only)
 CSC = California Species of Special Concern
 * = Special Animals
 3511 = Fully protected bird species (Fish and Game Code)
 3503.5 = Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)
 4800 = Mountain lion protection

High Potential = Species expected to occur and meets all habitats as defined in list.
 Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
 Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.
 -- = No listing status.

^a Federal delisting is currently proposed, pending publication in the Federal Register.

SOURCE: Environmental Science Associates, 1994, 1998; CDFG, 1998

CHAPTER XII

LIST OF ACRONYMS

ADA	Americans with Disabilities Act
ASTM	American Society for Testing and Materials
BAAQMD	Bay Area Air Quality Management District
BARTC	Bay Area Ridge Trail Council
BERM	Bureau of Environmental and Regulatory Management (now SPEAC)
BMPs	Best Management Practices
CAA	federal Clean Air Act
Cal-EPA	California Environmental Protection Agency
Cal-OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCWD	Coastside County Water District
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CHAMP	Chemical Application Management Plan
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
DMG	California Division of Mines and Geology
DTSC	Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESZ	Environmentally Sensitive Zone
GIS	Geographic Information System
GGNRA	Golden Gate National Recreation Area
HCP	Habitat Conservation Plan
IC	Incident Command
IPM	Integrated Pest Management

kV	kilovolt
LRMS	Land and Resource Management Section
MEA	Major Environmental Analysis
MMRP	Mitigation Monitoring and Reporting Program
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
msl	mean sea level
NDDB	Natural Diversity Data Base
NEPA	National Environmental Protection Act
NES	National Energy Strategy
NIOSH	National Institute for Occupational Safety and Health
NOP	Notice of Preparation
OER	Office of Environmental Review (now MEA)
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric
PM-10	suspended particulate matter
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SCADA	Supervisory Control and Data Automation
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Department
SMARA	Surface Mining and Reclamation Act
SPARC	System Planning and Regulatory Compliance (now SPEAC)
SPEAC	System Planning, Environment and Compliance
UEB	Utilities Engineering Bureau
USFWS	United States Fish and Wildlife Service
USTs	underground storage tanks
vpd	vehicles per day
WPC	Watershed Planning Committee
WQVZs	Water Quality Vulnerability Zones
WTP	Water Treatment Plant

CHAPTER XIII

EIR AUTHORS AND CONSULTANTS; ORGANIZATIONS AND PERSONS CONSULTED

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• CHAPTER XIV

SUMMARY OF COMMENTS AND RESPONSES

This chapter includes the “Master Responses” to comments received on the Peninsula Watershed Management Plan Draft Environmental Impact Report (EIR). The Master Responses were prepared to summarize responses to the vast majority of comments received on the Draft EIR. Due to the unusually large volume of comments received, the complete Comments and Responses document is correspondingly large and including a copy within the Final EIR has not been attempted. Copies are available for review at the San Francisco Main Library (Civic Center), and libraries in Atherton, Belmont, Burlingame, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Redwood City, San Bruno, San Carlos, San Mateo, San Jose, and Woodside, and at the Planning Department’s environmental section office at 30 Van Ness Avenue, Suite 4150 (4th floor). An extremely limited number of copies are available at a cost of \$50 by calling 415-558-5965. Once the limited number of copies is exhausted, reprinting will not occur unless substantial orders are received.

The Comments and Responses document includes five chapters; Chapter I is an introduction to the document. Chapter II contains a list of persons and organizations who submitted written comments on the Draft EIR and who testified at the public hearings on the Draft EIR held on February 1, 2000 in San Mateo and February 3, 2000 in San Francisco. Chapter III provides master responses, as described below. Chapter IV contains copies of all letters and oral comments received on the DEIR. Chapter V contains text changes to the Draft EIR subsequent to publication of the Draft EIR, including: minor corrections made by the EIR authors to improve writing clarity, grammar, and consistency; corrections or clarifications requested by a specific comment; or staff-initiated text changes to update information presented in the DEIR.

Below, Section XIV.A discusses and clarifies the programmatic nature of the EIR, in response to numerous comments regarding the EIR’s level of detail and lack of clarity about the extent of future environmental review necessary to implement the Peninsula Watershed Management Plan. Section XIV.B responds to comments concerning jurisdictional issues, particularly the federal government’s authority over the Watershed, and the SFPUC’s authority to conduct ongoing water facility system and watershed operations and maintenance. Section XIV.C addresses concerns about whether mitigation measures listed in the EIR would be carried out, particularly those measures consisting of Management Plan actions that would mitigate the impact of other Management Plan actions. Section XIV.D responds to numerous comments about the proposed Fifield/Cahill Ridge Trail, including alignment alternatives and the experience of other jurisdictions in providing public access to watershed and open space lands. Section XIV.E discusses and clarifies mitigation measures identified in the EIR for Fifield/Cahill Ridge Trail impacts, responding to many comments that the measures were unnecessarily severe and

restrictive and numerous other comments that the measures were insufficient to avoid significant impacts.

A. PROGRAMMATIC NATURE OF THE DRAFT PENINSULA WATERSHED MANAGEMENT PLAN AND EIR

Many commentors raised concerns regarding the level of detail provided in the DEIR's analysis. As described on DEIR pages II-21 and II-22, the EIR is a programmatic document that analyzes, at a general level, the potential environmental impacts of a broad range of policies and management actions proposed by the draft Peninsula Watershed Management Plan. As noted on DEIR page II-22, one element of the Management Plan, the proposed Fifield/Cahill Ridge Trail project, is reviewed at a project-level (see Sections II.D and II.E, below). The scope of this EIR was determined by the San Francisco Planning Department, and was described in two Notices of Preparation (issued October 1996 and August 1998 – see DEIR page II-23). The scope was also reviewed in a public scoping meeting held on November 7, 1996.

Programmatic documents are used under CEQA to determine the general impacts from a planning effort. This is a useful approach because it provides decision-makers with an indication of the extent of impacts in situations where full project details are not yet developed. In addition, programmatic documents provide an opportunity to meet the CEQA goal of analyzing impacts at an early stage of the project. The nature of a programmatic document that covers a broad plan is to discuss all impacts at a general level. The DEIR discloses where there are indications that significant impacts could occur, recommends mitigation measures, and, where required, recommends further environmental review. The DEIR analyzed the impacts of day-to-day operational activities that would be guided by the Management Plan and recommended mitigation measures for these activities. It is generally not expected that these day-to-day operational activities would require further environmental review.

The Watershed Management Plan, typical of many management planning documents, also calls for development of more specific guidelines and plans. The San Francisco Planning Department would consider whether environmental review would be required for any proposed project or guideline/plan at the time they are proposed for implementation. For instance, when a Management Plan Action called for developing guidelines or programs, such as Action veg8 (develop forest management prescriptions and guidelines for both hardwood and coniferous tree species), such guidelines would be reviewed by the Planning Department to determine if further environmental review is required before guidelines are adopted and implemented. In the case of Action veg8, and as indicated on DEIR Table II-1, it is unlikely that additional environmental analysis would be required because the resulting guidelines are likely to apply best management practices to improve ongoing maintenance activities. This process is further described in the Master Response on Commitment to Mitigating Actions/Mitigation Requirements (see Section III.C of this document).

In a few cases, development of plans, as called for in Management Plan actions, are anticipated to require CEQA review. DEIR Table II-1 identifies the specific management actions that are likely

to require further CEQA review. For instance, development of a comprehensive, multi-species Habitat Conservation Plan for the entire Watershed (Action wil9) would typically require CEQA review of the plan.

Several commentors voiced concerns that a particular resource or species had not been specifically mentioned with respect to a particular impact. In discussing potential impacts of the draft Management Plan, primary attention was given to that portion of the resource or to species that would be affected in a significant way by activities, policies, and/or the objectives proposed. Because the level of detail for the analysis is commensurate with that of the Management Plan, only the most potentially impacted natural resources are discussed. As an example, impacts to nesting birds were discussed in association with removal of non-native forests. There would likely be other impacts as a result of this action, such as impacts to other species that could inhabit non-native forest trees, but the impacts to nesting birds is the most significant and the mitigation measures proposed to address this impact would also reduce all other adverse potential impacts to a less than significant level. The nature of a programmatic planning document does not allow the analytical level of detail needed to address every permutation of every potential impact. More detailed CEQA analyses of individual projects would take place in the future, as specific projects are proposed by SFPUC. Please see Section III.C (Commitment to Mitigating Actions/Mitigation Requirements) below for a more detailed explanation of how CEQA review would be carried out for SFPUC actions and projects that may be proposed pursuant to the Management Plan.

B. JURISDICTIONAL ISSUES

1.0 FEDERAL JURISDICTION

Several comments were received referencing and/or questioning federal interests in the Peninsula Watershed Lands. Many of these comments request that federal interests be more fully represented in the SFPUC's mission statement and in the DEIR. As the SFPUC's Watershed management mission statement (see DEIR page I-1) deals primarily with how watershed activities affect water supply and water quality, it is not an appropriate place to detail federal interests in these lands. However, federal interests are described on DEIR page III.A-12, under the section describing the U.S. Department of Interior's Scenic and Scenic and Recreation Easement on Watershed lands. Some comments suggested adding language that would expand the description of the primary goals of the Management Plan to include resource protection. However, adding this language would be redundant as the protection of natural resources is already discussed in the SFPUC mission statement (DEIR page I-2), which serves as the basis for the Watershed Management Plan.

Several comments stated that approval of the Golden Gate National Recreation Area (GGNRA) or federal concurrence is required for certain non-water-related activities. DEIR page III.A-12 clarifies that the GGNRA can object to development unrelated to utility management or other uses not permitted by the terms of the two easements (described on page III.A-12). It is the position of the City and County of San Francisco and the SFPUC that none of the actions under

the Peninsula Watershed Management Plan are counter to the terms of the federal easements and thus Management Plan actions are within the SFPUC's purview. The SFPUC's position is that the Watershed Management Plan is an exercise of planning authority by the SFPUC in furtherance of its management of the property for water utility, Watershed resources protection, and public use purposes, and is within the City's rights as a fee owner. Comments received do not identify any specific actions that the commentors feel would require federal concurrence.

The primary goal of the Management Plan is to maintain and improve source water quality. One of the secondary goals of the Management Plan is are to provide opportunities for potential compatible uses on watershed lands, including educational, recreational and scientific uses, and to enhance public awareness of water quality, supply, conservation, and watershed protection issues. The SFPUC as fee owner of the Peninsula Watershed may allow recreational access. The text of the Scenic Easement and the Scenic and Recreation Easement do not prohibit such access. Maps accompanying the Scenic Easement (where the proposed Fifield/Cahill Ridge Trail would be located) contemplate the possibility of trails throughout the Watershed at the discretion of the SFPUC. Allowing the public to enter for recreational purposes serves the secondary Management Plan goal described above and is a legitimate exercise of the SFPUC's utility management powers under the terms of the easements and the SFPUC's reserved rights as fee owner. Federal concurrence for recreational access and adjunct facilities is accordingly not required.

Some comments received implied that the Scenic and Recreation Easement requires recreation throughout the Watershed. This interpretation is not correct. Recreational access has been allowed via the Sawyer Camp trail and other trails in the eastern part of the Watershed, but is not required under the terms of the easement.

The language of the easements also does not support one commentor's suggestion that the Watershed land must be maintained in its 1969 state. In addition, this comment suggests placing limitations on earth moving, except as part of an "erosion control strategy." These statements have no textual basis in the easements.

2.0 CURRENT OPERATION OF WATER FACILITIES AND WATERSHED OPERATIONS AND MAINTENANCE

Several commentors essentially stated that the SFPUC should mitigate for habitat impacts associated with existing watershed operations and maintenance. The Draft Watershed Management Plan contains a strategy to achieve the goals of the SFPUC, presented in the DEIR on pages I-1 and I-2. DEIR pages I-1 and I-2 present a mission statement developed by the SFPUC to guide management of the Watershed. As this mission statement was developed, it became clear that existing SFPUC policies do not fully support the mission statement nor do they address the general management of Watershed lands in a comprehensive or integrated manner. The comprehensive policies, objectives, and activities in the Management Plan are proposed to improve on-going practices, as well as to propose new management practices that support the mission statement. In order to develop the policies that make up the Management Plan, the SFPUC undertook a detailed examination of current operations and Watershed activities.

However, as these activities represent the existing setting, a comprehensive assessment of their impacts is outside the scope of the EIR. Many Management Plan actions are designed to lessen the impact that past and ongoing operations and maintenance practices might have on the environment.

As an example, the National Park Service requested a comprehensive assessment of existing public access on the Watershed. Public access on the Watershed and nearby areas was discussed in the EIR to the extent necessary for an understanding of potential Management Plan impacts. Existing trails are depicted in DEIR Figure III.B-2 to characterize the environmental setting, and to give the reader some context for issues associated with public access. The DEIR has sufficient information for readers to understand the existing physical conditions (the environmental setting) of the Peninsula Watershed, and includes a thorough analysis of proposed changes to these existing conditions resulting from implementation of the Management Plan.

The purpose of a CEQA document is to evaluate the potential for significant physical changes that might occur as a result of implementation of a project. Existing operations, maintenance and other activities and policies do not constitute changes that could be defined as a “project” (CEQA Guidelines Section 15378) and are therefore not analyzed in the DEIR. Rather, they form the environmental baseline (existing setting) against which changes proposed by the Management Plan were analyzed for their potential impacts. The EIR analyzes the Watershed Management Plan as proposed; it is beyond the scope of an EIR to analyze and mitigate impacts of existing ongoing operations.

In addition to comments regarding overall existing Watershed operations and maintenance activities, some commentors specifically requested information regarding the effect of ongoing and potential future water facilities operations on fisheries resources. The Management Plan is not a water facilities development or operation plan. The Management Plan does not and is not intended to address or change ongoing operation of the water supply facilities within the Watershed.

CEQA requires examination of a project’s potential impacts on the existing environment, defined in CEQA Guidelines Section 15125(a) as the baseline physical conditions extent at the time the notice of preparation was issued. Although CEQA does not require analysis of a project’s possible impacts upon future potential environmental restoration projects, there is no evidence that implementation of the Management Plan would significantly impact fisheries resources in the Peninsula Watershed, or San Mateo and Lower Pilarcitos creeks. Nor would Management Plan implementation adversely impact existing reservoir populations of resident rainbow trout. Management Plan Action fis1 (maintain access for fish species of concern from reservoirs to upstream spawning grounds) and other proposed Fisheries actions are designed to benefit this species. The potential for restoration of viable anadromous steelhead populations in the Watershed is recognized and supported by the SFPUC. Actions that may be proposed in furtherance of this goal would constitute projects separate from the Watershed Management Plan project and would require separate environmental review.

The distinction of existing operations is particularly relevant to many comments received that addressed SFPUC’s operations and practices regarding water releases and how these practices

affect fisheries in the area. As described above, the Peninsula Watershed Management Plan was designed to guide improvements to existing practices, and the purpose of the EIR is to determine potential impacts of the Management Plan, not to examine every existing operation for impacts. As indicated above, there are many Management Plan actions (specifically fis1 through fis12) that would improve fisheries throughout the Watershed, however the Management Plan does not propose any changes to current water release practices. In particular, Action fis11 calls for SFPUC's participation on the Pilarcitos Creek Restoration Project Advisory Committee, conducting further studies to determine the feasibility of establishing a trout fishery on Pilarcitos Creek, and assisting in annual creek cleanups. The SFPUC is also addressing downstream conditions for anadromous fish in other forums.

C. COMMITMENT TO MITIGATING ACTIONS/MITIGATION REQUIREMENTS

The way in which mitigation measures were introduced and the commitment to implementing mitigation measures was a point of concern for many commentors. The SFPUC has not determined funding and timing implementation of the numerous actions called for by the Management Plan. As many commentors noted, the list of Management Plan actions in DEIR Table II-1 contained an important footnote stating that the SFPUC could not ensure funding, staff, or equipment to implement the actions and that the SFPUC reserved the right not to implement actions. Furthermore, the Management Plan proposes some of the mitigating management actions to be phased to occur after the management action that could cause a significant impact. The Management Plan organizes management actions into various phases for implementation. Phases 1, 2, and 3 set goals for management action implementation within five, ten, and twenty years of Management Plan adoption, respectively. In addition, a Phase A is established which calls for implementation on an as-needed basis, and a Phase B identifies management actions that would be implemented at regular intervals throughout the life of the Management Plan. Phases A and B are sometimes combined with Phase 1, 2, and 3. Therefore, the DEIR took a conservative approach and identified the potential impacts for any action or project for which impacts could not be ruled out.

While the Management Plan does not commit to implementing Management Actions that would reduce or eliminate potential significant effects associated with other Management Actions, the DEIR concluded that many of the potential impacts would be mitigated only if other Management Plan actions were implemented concurrently. As a result, in Chapter IV, Program-Level Mitigation Measures, the EIR identifies linkages between management actions that could cause impacts and corresponding management actions that may be required to reduce or avoid impacts. Because the mitigative management actions are themselves proposed within the Management Plan, the EIR's mitigation section placed the measures that would ensure these linkages in the category of 'Mitigation Measures Proposed as Part of the Project.' This approach confused some commentors and some readers presumed that the SFPUC was serving notice that it might choose to ignore mitigation measures or manage land in such a way as to cause significant impacts. To clarify that, although the actions are proposed as part of the Management Plan, the linkages of mitigative management actions with other actions that could potentially result in project impacts

have not been proposed as part of the Management Plan, the text of the Draft EIR will be revised to place those mitigation measures in the category of ‘Mitigation Measures Identified in This Report’ and add appropriate clarifying language. The specific Draft EIR text revisions are found in the Text Revisions and Staff-Initiated Text Changes chapter of this comments and responses document.

As an example, Mitigation Measure IV.E.1 would require ensuring that, in implementing any Management Plan action that could result in significant physical effects to natural resources from the removal of non-native forests, as shown in Table III.E-4, all applicable Management Plan actions are implemented that are necessary to reduce the impact to a less than significant level as shown in Table IV.E-4. This measure would require that (per Table III.E-4), if Action veg7 (remove stands of non-native forests such as eucalyptus, Monterey Pine and Monterey Cypress) is implemented, then Actions veg7.1 (identify and preserve stands of non-native trees that serve as important overwintering roosting sites for Monarch butterfly or that serve as important roosting and nesting sites for birds protected by CDFG Code 3503), will1 (prior to planning and construction, conduct site-specific review of new facilities, roads or trails to avoid adverse impacts to wildlife), and possibly veg5 (develop native species planting program in coordination with fire management activities) must be implemented concurrently. EIR text on pages III.E-24 and III.E.26 describes the basis for these mitigative linkages between Management Plan Actions.

At the time of adoption of the Management Plan, the SFPUC will adopt CEQA Findings that will state which mitigation measures the SFPUC is accepting and which it is rejecting. If mitigation measures are rejected and significant impacts would result, the SFPUC will make findings explaining why the measures are infeasible. If, after adoption of feasible mitigation measures, significant environmental effects would occur, the SFPUC would also adopt a statement of overriding considerations explaining why the benefits of the project outweigh the adverse environmental effects. For all mitigation measures adopted, the SFPUC will adopt a Mitigation Monitoring and Reporting Program (MMRP) that will specify the process by which all adopted mitigation measures will be carried out. The MMRP will clearly link those management actions that could have significant environmental impacts with those management actions that would mitigate the impacts. The MMRP will also detail responsibilities for enforcement. The Management Plan and each subsequent action or project approved by the SFPUC will include CEQA Findings (per CEQA Guidelines Section 15091) that will include a determination of any environmental consequences of the particular action, project, or set of actions. The Findings document will also include and address all relevant mitigation measures.

Currently, all but very small SFPUC projects are reviewed for CEQA compliance by the San Francisco Planning Department pursuant to Chapter 31 of the San Francisco Administrative Code. This procedure would essentially remain the same if the Management Plan is adopted. Thus, information in this EIR and the requirements of the adopted MMRP would be in place as future SFPUC actions or projects are proposed.

As stated above and in the DEIR, whether or not particular Management Plan actions are implemented is dependent on SFPUC funding and staffing. 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. Section 15168 defines a Program EIR, lists the advantages to using a Program EIR, describes how a Program EIR can be used for later activities, and establishes public notice requirements for a Program EIR used for CEQA compliance for later activities. Section 15162 contains basic tests for determining whether a certified Program EIR (or any certified EIR or adopted negative declaration) may be used for CEQA compliance for a project and, together with Sections 15163 and 15164, would be used to decide whether a subsequent EIR, supplemental EIR, EIR Addendum, or subsequent negative declaration is appropriate.

Essentially, these sections of the CEQA Guidelines indicate that no new environmental document is required if substantial evidence in the record indicates that the later activity would generate no new or substantially increased significant environmental impacts, nor would new or substantially different mitigation measures be appropriate or feasible. If only minor additional information to the program EIR is necessary and no new impacts or mitigation measures are identified, an Addendum may be prepared. If there could be new impacts or if new mitigation measures have been identified, but only minor additional information is necessary, a Supplemental EIR is normally appropriate. If major changes are proposed or major new information becomes known involving new significant impacts or mitigation measures, a Subsequent EIR may be appropriate. Under certain circumstances, such as potential new impacts that could be fully mitigated, a subsequent negative declaration may be appropriate.

CEQA Findings would also accompany future decisions to implement any Management Plan actions that are identified as possibly causing impacts. It should be noted that, because the EIR conservatively assumes that Management Plan actions could cause impacts unless the possibility could be ruled out, it is expected that future analysis of specific Management Plan implementation actions could demonstrate that no significant impacts would occur as a result of project implementation and that the program-level mitigation measures identified would not be necessary to avoid a significant impact. The CEQA Findings for future decisions would make it clear whether mitigation was needed and adopted or not. Findings would be based on information in the program EIR, any additional environmental review that may be required, and other information in the public record.

As an example of how this review process would actually be implemented, consider the process that would result from a decision by the SFPUC to fund Management Plan Action roa2 (relocate existing high use road/road segments in proximity to streams that are the primary source of excessive erosion and sedimentation, wherever possible). Because Table II-1 (DEIR page II-28) notes that this action may require further environmental review, at the time specific road relocation projects may be proposed, SFPUC would consult with the Planning Department to determine any special studies that would have to be undertaken and the appropriate level of CEQA review. As shown on Table III.E-5 (DEIR page III.E-28), mitigative actions that are identified as linked to Management Plan Action roa2 include a vegetation management plan, an exotic tree survey, and wildlife surveys. With the completion of these studies, any project-specific mitigative actions would be identified. These actions would then be implemented as part of the specific road relocation project.

D. GENERAL FIFIELD/CAHILL RIDGE TRAIL ISSUES

1.0 FIFIELD/CAHILL RIDGE TRAIL ALTERNATIVES

By far the largest number of comments received voiced varied preferences for Fifield/Cahill Ridge Trail alternatives. These comments ranged from requests to keep the Watershed completely off limits to public access to requests for unlimited public access. The primary issues from the individual comments are summarized below.

Many commentors either called for no access at all or supported the position of California Department of Fish and Game and recommended an alternative Bay Area Ridge Trail alignment located entirely on the eastern side of the Watershed. If the SFPUC continues to pursue the Fifield/Cahill Ridge trail, CDFG recommended Alternative D as the only feasible alternative based on reducing listed species impacts and habitat fragmentation issues and the potential to mitigate for those impacts. The Department of Health Services and the U.S. Fish and Wildlife Service also recommended Alternative D as the most protective of the public water supply and federally listed special status species. Given these positions expressed by resource agencies and the analysis in the DEIR, Alternative D will be identified as the environmentally superior alternative. See Chapter V of this document, EIR Text Revisions and Staff-Initiated Text Changes.

On the other hand, many commentors supported increased opportunities for public access along the Fifield/Cahill Ridge by calling for the adoption of either Fifield/Cahill Ridge Trail Alternative A or B. Many of these commentors stated opinions that the DEIR overstated impacts and proposed mitigation measures that are unreasonable (see Section III.E, Fifield/Cahill Ridge Trail Mitigation Requirements). Among supporters of the Fifield/Cahill Ridge trail, some agreed that a phased implementation was important to better assess impacts. Many of these supporters cited lack of impacts experienced by other open space and/or watershed managers. This issue is discussed further below in the “Other Jurisdictions” subsection.

The Bay Area Ridge Trail Council (BARTC) included with their comments an alternative proposal for the opening of the Fifield/Cahill Ridge Trail, which calls for a phased opening of the trail to public use and includes some similarities to various trail alternatives described and analyzed in the EIR. However, the BARTC proposal calls for fewer user facilities and usage requirements than included in the Fifield/Cahill Ridge Trail alternatives included in the Management Plan, and includes separate trail routes for hikers/bikers and equestrians south of the cemetery gate. The proposal involves, as a first phase, implementation of docent-led access three days per week for hikers, cyclists and equestrians, with part-time monitoring by a biologist as well as video monitoring. Based upon monitoring, “adjustments” would be made “as required” to implement, as phase two, access by permit for hikers, cyclists and equestrians, still restricted to three days per week. At this time, unrestricted access for hikers and cyclists with access terminating at Highway 92/Skyline Boulevard and unrestricted access for equestrians with access terminating at Skyline Quarry would be implemented for one Sunday per month. Usage would be monitored to determine if more signage, gates and fencing is necessary before implementation of phase three, unrestricted access for hikers and cyclists with access terminating at SR 92/Skyline

Boulevard and unrestricted access for equestrians with access terminating at Skyline Quarry seven days per week. Monitoring would continue to determine if further infrastructure or other changes are needed.

Subsequent to the comment period on the DEIR, proponents of the Fifield/Cahill Ridge Trail alignment have continued to discuss possible access options, and have met with some environmental groups concerned with resource protection to define an alternative that would resemble the “first phase” described above (i.e., docent-led access for hikers, cyclists and equestrians).

Phase one of the BARTC proposal is similar to the proposed Fifield/Cahill Ridge Trail Alternative D, although the BARTC proposal would include docent led bicycle and equestrian access, while Alternative D does not. The BARTC proposal phase one includes only docent-led access with limits on the number of users for all three recreational uses types, with the intention of restricting unauthorized off-trail use. The majority of impacts identified in the EIR were related to unauthorized off-trail use, thus the preliminary conclusion is that the addition of docent-led bicycle and equestrian use may not result in significant impacts other than those described in the EIR. Phases two and three of the BARTC proposal are also similar to Fifield/Cahill Ridge Trail Alternatives C, and A and B, respectively, and thus the likely impacts would fall within the range described in the EIR. The mitigation measures identified in EIR Chapter VI would be needed for the relevant comparable BARTC alternative to avoid potentially significant impacts from the various phases of use under the BARTC proposal. The need for mitigation is supported by the position of the resource agencies that commented on this project and the EIR (see Comment Letters C, G, H, I, and J)

Any proposal that falls within the range of trail use alternatives analyzed in the EIR could be considered for adoption by the SFPUC following consultation with resource agencies and the environmental review staff of the San Francisco Planning Department. In making their decision, the SFPUC would need to make findings regarding the mitigation measures identified in the EIR that would be necessary to mitigate potentially significant impacts of different proposals.

2.0 OTHER JURISDICTIONS

Many letters received included a request to compare the experience and policies of other water districts with public access on watershed lands. Both the Management Plan and the DEIR did examine the experience of other jurisdictions. Many commentors cite the experience of accessing Marin Municipal Water District’s (MMWD) watershed lands. DEIR preparers examined several years of incident reports from MMWD and spoke to managers at other water districts. There is evidence that multi-use trails can be successful if used responsibly. It is also clear from examining data from other water districts and open space areas, and from speaking to their reservoir managers, that not all users are responsible.

Off trail use can cause severe resource damage (erosion), cause habitat destruction, facilitate poaching, and start fires. Examination of the experience of MMWD and, quite recently, those of Midpeninsula Regional Open Space District (MROSD) indicate the difficulty of policing off trail

use and the construction of illegal bike trails. MMWD's experience was briefly discussed on DEIR page V-28 and MMWD officials say they continue to discover unauthorized trails in their watershed (e.g., the two-mile "Paradigm Trail" built over a 3-year period through heavy vegetation). In the fall of 1999 rangers from MROSD discovered six illegally built trails on MROSD lands in Woodside. The construction of these trails included cutting into steep hillsides, and construction and use of the trails had caused erosion and damage to surrounding vegetation. In addition, natural drainages had been filled with rocks (to enable crossing), which can increase the incidence of erosion. MROSD recently closed 13.6 miles of their trails to bicyclists due to the damage to trails, which endangers the open space status as a preserve and raises the cost of repairing and maintaining trails.

As made clear through many of the comments received, policies from other water districts and open space areas do not restrict or heavily monitor recreational use to the degree proposed in the DEIR. Several letters have asked why SFPUC's policy should be more restrictive than other similar areas. In part, a more restrictive policy was developed for the Peninsula Watershed due to this land's sensitive environmental resources, comparative isolation, and the lack of access it has received historically. The U.S. Fish and Wildlife Service states in their comment letter: "Few areas remain in the San Francisco Bay Area that have such a large and relatively undisturbed expanse for wildlife to exist, and [there are] even fewer areas where so many federally listed species can be found in one place." This quality, and the experience of other water districts and open space agencies with unlimited multi-use, has led SFPUC to establish a more conservative approach to trail management.

It should be noted that other water utilities in the Bay Area discussed in this discussion have the ability to fully treat their water supply, including large sedimentation ponds for particle settling prior to further filtration. Because the SFPUC obtains 85 percent of its water as clear snowmelt from the Hetch Hetchy Reservoir, it is not necessary for SFPUC facilities to include full treatment, and therefore, only direct filtration is used. The other water utilities cited in this section can afford to allow relatively unrestricted public access in their watersheds because they have the infrastructure in place for full treatment. A notable exception is East Bay Municipal Utility District, which does not allow bicycles on its wilderness trails. East Bay Municipal Utility District only allows bicycle use in select, developed recreation areas. Seattle's Cedar River Watershed and Portland's Bull Run Watershed also provide those cities with water from clear snowmelt sources. Like the SFPUC, these municipal water departments rely on direct filtration of their water. As a result, public access to those watersheds is restricted by permit systems.

A few comments received asked that the discussion of impacts deal with off trail uses only. While unauthorized off trail use was determined to be associated with most of the identified potential impacts, the DEIR concludes that on trail use could have significant impacts as well, such as increased spread of invasive species, loss of wildlife due to inadvertent crushing by pedestrians, bicycles, horses, or maintenance/emergency vehicles, and increased fire hazard (see DEIR pages V-25 through V-27, and V-33 through V-34). Therefore mitigations are identified that would address potential impacts from on trail use for the various trail alternatives, and to delete this analysis from the EIR would not comply with CEQA requirements.

E. FIFIELD/CAHILL RIDGE TRAIL MITIGATION REQUIREMENTS

Many comments were received relating to the DEIR's suggested mitigation measures for the various Fifield/Cahill Ridge Trail alternatives, ranging from statements that the potential impacts would not be fully mitigated by the measures identified in Chapter VI of the DEIR, to statements that these mitigation measures were unnecessary or too stringent. Comments that addressed specific concerns regarding particular mitigation measures or the analysis in the DEIR have been responded to individually in Chapter IV of this document. The discussion here is intended to provide an overview of these issues.

Several comments under this category asserted that some mitigation measures defer the development of mitigation measures to the future, which they contend is not acceptable under CEQA. While it is true that several mitigation measures call for the development of specific "plans" or "programs" for management and/or control of resources, they set explicit performance standards for subsequent development of more specific measures.

Many comments expressed objections to video monitoring, in particular that the impact assessment on pages V-25 through V-30 does not provide a description of the impacts [video monitoring] mitigations are intended to address. Other comments objected to human surveillance on the trail. An explanation of the impacts these mitigation measures are designed to address can be found at the conclusion of the section entitled "Loss of Vegetation and Wildlife Resulting from Recreational Activities" on DEIR pages V-27 and V-28. Video monitoring, although an atypical measure, was not specifically suggested as required to avoid impacts, but rather was included as a trail surveillance option under the mitigation measure # 7 (DEIR page VI-3). The mitigation measure reads, "Such surveillance may include the use of video and/or GPS technology." (Emphasis added.) This language does not require that this technology be used, but is simply one suggested method for achieving 24-hour surveillance. This mitigation measure is intended to keep trail users from going off trail, as the great majority of identified potential adverse impacts stem from off trail users. While trail users may consider these measures excessively burdensome, the EIR analysis concludes that habitat sensitivity issues unique to this watershed warrant consideration of rigorous mitigation measures. This conclusion is supported by resource agencies commenting on the EIR. The suggested mitigations do not violate any of the provisions of CEQA. They are intended to satisfy--in a situation where the ultimate, long-term impacts may be irreversible--the standards that determine whether or not an impact can truly be mitigated to below the level of significance.

1.0 "TAKE" PERMITS

Several comments request that the discussion of developing a habitat conservation plan or obtaining take permits be eliminated from the EIR. The comments received on the DEIR from the resource agencies (U.S. Fish and Wildlife and California Department of Fish and Game) support this conclusion. There is an abundance of material in the DEIR and the referenced Biotic Assessment that suggests that there is a risk of "taking" (harming or harassing) several listed species from unrestricted recreational access. In informal consultation on the implications of implementing the Management Plan, state and federal resource agency biologists expressed

concern that a taking of state or federal species could occur due to actions enabled by the Management Plan. These concerns were expressed as early as 1994 (USFWS correspondence to John Mullane, August 15, 1994), and as recently as 1997 (CDFG letter to Hillary Gitelman, October 9, 1997). It may be possible that enactment of many Management Plan actions (including Fifield/Cahill Ridge Trail public access with docent supervision) would not bring about the taking of a special status species. Nonetheless, the resource agencies have advised that to be in compliance with state and federal law protecting listed species, a habitat conservation plan must be prepared when a taking is likely, as the basis for the legal documents allowing the taking to occur.

2.0 MARBLED MURRELET MITIGATION

Other comments ask for specific information about the marbled murrelet and other sensitive species, including the reporting of any consultation held with resource regulatory agencies. Specific information regarding the ecological requirements of special status species is found on DEIR pages III.E-6 through III.E-23. The SFPUC has not initiated formal consultation with the California Department of Fish and Game and/or the U.S. Fish and Wildlife Service, however several meetings have been held on the Management Plan and the above listed agencies' concerns have influenced Management Plan policies and the development of mitigation measures. In addition, the references listed in the Natural Resources section (DEIR Section III.E) includes the agency databases and biologists with species-specific expertise that were consulted during the DEIR analysis.

Several commentors noted that the marbled murrelet is known to nest in other areas where roads or trails are heavily used and suggested that the mitigation measures proposed in the DEIR were therefore unnecessary and unreasonable. Many of these comments also noted that marbled murrelets did not stay in their nests during the day when recreation is likely to occur. While it is true that in some portions of their range, small marbled murrelet populations are in close proximity to trails and campgrounds, and that they do travel from the nest during the day, the habitat on Peninsula Watershed lands has a special importance in the preservation of the species. The habitat has been designated as occupied critical habitat under the Endangered Species Act. While the designation applies primarily to the actions of federal agencies, the designation is a clear indication by the scientific community that caution should be exercised in evaluating proposed activities in occupied critical habitat. The DEIR states that docent-led access could be required within or adjacent to critical habitat areas from May 15 to August 15, in order to control unauthorized uses that might occur in the absence of docents. This seasonal closure was determined due to its sensitivity during the breeding season. The impacts that could occur during the breeding season were not well described in the DEIR. DEIR page V-27 will be revised to clarify this impact (see Chapter V of this document, EIR Text Revisions and Staff-Initiated Text Changes). As described on DEIR page V-27, increased human disturbance has been shown to alter bird nesting behavior and increase use by corvids (i.e., ravens and crows). The impacts to breeding birds would be reduced if human disturbance were limited during the breeding period from May 15 to August 15. Docent-led access would allow regulation of the total amount of human use in the critical habitat area and reduce or eliminate the possibility of off-trail activity.

This cautionary approach is also informed by studies citing the decrease in wildlife productivity and diversity from an increase in human activity (see DEIR page V-27). The fact that certain activities occur within other critical habitat areas does not mean that there is no effect from these activities, and is not an appropriate basis to conclude that Peninsula Watershed marbled murrelet habitat should be opened to increased public use without mitigation.