3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This section presents the analysis topics included in the Hetch Hetchy Communication System Upgrade Environmental Assessment/Initial Study (EA/IS). Topics were selected based on federal and state laws and regulations, Executive Orders, National Park Service (NPS) Management Policies, United States Forest Service (USFS) Policies, and concerns expressed by the public, NPS and USFS staff, or other agencies during scoping and comment periods. Twenty separate resource topics are discussed in detail in this section. This section also provides a discussion of four topics that were dismissed from further analysis.

To conduct an environmental analysis under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), the "baseline" or "affected environment" must first be described. This section provides information on the existing natural, cultural, and social conditions relevant to the Proposed Action. The planning context is also presented in Section 1.9.3. The information provided on existing conditions forms the basis for considering the potential impacts, or environmental consequences of the Proposed Action, and mitigation measures, if needed.

The major elements of the impact analysis under NEPA, including specific National Park Service requirements that are common to all resource topic areas are described. Following this introduction, an analysis of impacts within each resource area is provided, starting at Section 3.8. Within the resource sections, NEPA/National Park Service/US Forest Service analysis is presented first for the Proposed Action, followed by the analysis for each of the project alternatives under consideration. A discussion of cumulative impacts is provided within each resource topic.

3.1.1 Cumulative Impacts

The Council on Environmental Quality (CEQ) describes a cumulative impact as follows (Regulation 1508.7):

> *A "Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

The cumulative projects addressed in this analysis include past actions, present actions, as well as any planning or development activity currently being implemented or planned for implementation in the reasonably foreseeable future. Cumulative actions are evaluated in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular resource. Because most of the cumulative projects are in the early planning stages, the evaluation of cumulative impacts was based on a general description of the project. Appendix A contains the list of cumulative projects included in the cumulative impacts analysis.

3.1.2 Impairment

Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. The need to analyze and disclose impairment impacts originates from the National Park Service Organic Act (1916). The Organic Act established the NPS with a mandate "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

An impact would be less likely to constitute impairment if it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values (NPS 2000). An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park
- Identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents.

The evaluation of impairment of park resources was based on the type and intensity of impacts and the types of resources affected. Overall, beneficial impacts would not constitute impairment. With respect to the intensity of impacts, negligible and minor adverse impacts are not of sufficient magnitude to constitute impairment. Moderate and major adverse impacts may constitute impairment, but do not automatically do so. Rather, these impacts must be analyzed with respect to the three bulleted criteria above. Impairment is generally considered for geologic, hydrological, biological, cultural, and scenic resources. Impairment pertains only to the NPS and is addressed in the conclusion section of each applicable impact topic for each alternative.

3.2 RESOURCE TOPICS CONSIDERED IN THIS ENVIRONMENTAL ASSESSMENT/INITIAL STUDY

3.2.1 Natural Resources

The federal and state Endangered Species Acts (and associated legislation), Clean Water Acts, Clean Air Acts, and NEPA require that the effects of Proposed Actions on natural resources be examined. Significant natural resources, such as habitat that could support special-status species, exist within the project site, and could be affected by the Proposed Action. Because 28 of the project sites are located within Yosemite National Park or Stanislaus National Forest, respectively—both areas of abundant natural resources—it is necessary to characterize these natural resources and the environmental consequences to these resources that would result from implementation of the project. These resources are also included in the City and County of San Francisco (CCSF) CEQA Checklist, and have been

combined with the NEPA resource areas. Analysis was performed for the following natural resource topics:

- Geology, Geohazards and Soils
- Hydrology, Floodplains, and Water Quality
- Vegetation
- Wildlife
- Rare, Threatened and Endangered Species
- Air Quality
- Noise

3.2.2 Cultural Resources

The National Historic Preservation Act, the Archeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, and NEPA require that the effects of any federal undertaking on cultural resources be examined. These resources are also included in the CCSF CEQA Checklist, and have been combined with the NEPA resource areas. Analysis was performed for the following cultural resource topics:

- Archeological resources
- Ethnographic resources
- Cultural landscape resources, including historic sites and structures

3.2.3 Social Resources

The analysis of social resources examines the effects of the Proposed Action on the social environment in Yosemite National Park and Stanislaus National Forest. The park and forest's scenic resources are a major component of the visitor's experience. Conserving the scenery is a crucial component of the National Park Service Organic Act of 1916 and the park's enabling legislation. Stewardship of Yosemite National Park requires consideration of two integrated purposes: to preserve Yosemite's unique natural and cultural resources and scenic beauty, and to make these resources available to visitors for study, enjoyment, and recreation. The Proposed Action has the potential to affect the type and quality of recreational uses in and around the immediate vicinity of the project site, such as visitors viewing the Poopenaut Valley and recreationists at Cherry Lake. The proposed upgrades to the Hetch Hetchy Communication System could affect various aspects of the existing environment that relate primarily to how humans perceive and experience their environment.

These resources are also included in the CCSF CEQA Checklist, and have been combined with the NEPA resource areas. Analysis was performed for the following social resource topics:

- Land Use
- Visual/Scenic Resources

- Visitor Experience and Recreation
- Transportation

3.2.4 CEQA Specific

The following resource areas are included in the CCSF CEQA Checklist, and have not been combined with other NEPA resources areas. These resource areas are therefore addressed separately.

- Population and Housing
- Utilities and Service Systems
- Public Services
- Hazards & Hazardous Materials
- Mineral and Energy Resources
- Agricultural Resources

3.3 IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

The following environmental topics were found to be not relevant to the Proposed Action, and were eliminated from further analysis: wilderness experience, environmental justice, socioeconomics, wetlands, and wind and shadow. A brief discussion as to why these topics were found to not be relevant is provided below.

3.3.1 Wilderness Experience

None of the proposed project sites occur within or are near commonly used access points into designated Wilderness boundaries. Therefore, this resource topic has been dismissed from further analysis.

3.3.2 Environmental Justice

No aspect of the Proposed Action would result in disproportionately high and adverse human health or environmental effects on minority or low-income populations. None of the action alternatives would change current management direction with respect to housing policies in Yosemite National Park, Stanislaus National Forest, or other adjacent areas. Policies concerning the future availability of housing in these areas are already in place and would not change as a result of the project. Therefore, the action alternatives would not result in the destruction or disruption of community cohesion and economic vitality, displacement of public and private facilities and services, increased traffic congestion, and/or exclusion or separation of minority or low-income populations from the broader community.

3.3.3 Socioeconomics

The Proposed Action would not have any measurable effects on the regional or gateway community economies, and would not result in changes in visitor attendance or visitor spending patterns. Therefore, this resource topic has been dismissed from further analysis.

3.3.4 Wetlands

None of the proposed project sites contain potential wetlands. No wetlands are expected to be impacted by project activities. Therefore this resource topic has been dismissed from further analysis.

3.3.5 Wind and Shadow

The CCSF CEQA Checklist includes the resource area of Wind and Shadow, which is analyzed for projects proposed within City boundaries to evaluate project effects on wind speed and shadows on public open spaces. The Wind and Shadow resource area is specific to the conditions in the CCSF. Due to the nature of the project, and because proposed upgrades and construction of new sites would not occur in the City, the San Francisco Planning Department determined that this resource area would not require further analyses.

3.4 REGIONAL SETTING

The project area is located in northern California, starting at approximately 100 miles east of the San Francisco Bay Area, and extends from the eastern edge of the San Joaquin Valley floor into the Sierra Nevada mountain range. The proposed sites would be located within the following areas (described from west to east):

- The Oakdale area (southeast of the City of Oakdale) in Stanislaus County
- The Moccasin Area in Tuolumne County
- The Duckwall Mountain Area in the Stanislaus National Forest
- The Early Intake and Tuolumne River Area in the Stanislaus National Forest (this includes Jones Point)
- The Cherry Lake Area in the Stanislaus National Forest
- The Lake Eleanor Area in Yosemite National Park
- The Poopenaut Pass and O'Shaughnessy Areas in Yosemite National Park

3.5 LOCAL SETTING

As described in Section 1.0, SFPUC has the ability to use sites within the Raker Act right-of-way for communication facilities. Federal agency involvement for the sites within the Raker Act right-of-way is limited to the approval of the appearance of the structures under Raker Act section 4. The US Forest Service and National Park Service are not the deciding agencies with regard to proposed activities and sites on Raker Act areas. The sites outside of the Raker Act right-of-way that would require USFS and NPS action include: Poopenaut Pass (NPS), Burnout Ridge (USFS), Duckwall Mountain (USFS), and Jones Point (USFS). The following describes the local setting of each site and whether it is within the Raker Act right-of-way or subject to NPS or USFS action/approval. Table 3.5-1 lists the general location of each site and whether sites are within the Raker Act right-of-way or CCSF-owned land.

Table 3.5-1
Location of Proposed Sites

Site	US Geological Survey 7.5 Minute Quad Map Name	Township-Range	Within Raker Act Right-of-Way or CCSF-Owned Land
Warnerville Switchyard	Waterford	02S 11E	X
Moccasin Peak	Moccasin	01S 15E	X
Moccasin Powerhouse	Moccasin	01S 15E	X
Moccasin Powerhouse Passive Reflector	Moccasin	01S 15E	X
O'Shaughnessy Dam Gallery	Lake Eleanor	01N 20E	X
O'Shaughnessy Dam Diversion Tunnel	Lake Eleanor	01N 20E	X
O'Shaughnessy Stream Gauge	Lake Eleanor	01N 20E	X
O'Shaughnessy Water Quality Building	Lake Eleanor	01N 20E	X
O'Shaughnessy Chalet (Cottage 1)	Lake Eleanor	01N 20E	X
O'Shaughnessy Watershed Keeper's Office/Residence (Cottage 4)	Lake Eleanor	01N 20E	X
O'Shaughnessy Bunkhouse	Lake Eleanor	01N 20E	X
O'Shaughnessy Water Tanks	Lake Eleanor	01N 20E	X
Lake Eleanor Dam Level Gauge	Cherry Lake South	01N 19E	X
Lake Eleanor-Cherry Lake Tunnel	Cherry Lake South	02N 19E	X
Poopenaut Pass	Lake Eleanor	01N 20E	
Cherry Valve House	Cherry Lake South	01N 19E	X
Cherry Pump Station	Cherry Lake South	02N 19E	X
Cherry Water Tanks	Cherry Lake South	01N 19E	X
Cherry Lake Garage and Warehouse	Cherry Lake South	01N 19E	X
Cherry Lake Camphouse	Cherry Lake South	01N 19E	X
Cherry Lake Cottage #1	Cherry Lake South	01N 19E	X
Cherry Lake Cottage #2	Cherry Lake South	01N 19E	X
Cherry Lake Cottage #3	Cherry Lake South	01N 19E	X
Cherry Lake Cottage #4	Cherry Lake South	01N 19E	X
Intake Radio Site	Ascension Mountain	01S 18E	X
Jones Point	Cherry Lake South	01S 18E	
Intake Switchyard	Cherry Lake South	01S 18E	X
Kirkwood Powerhouse	Cherry Lake South	01S 18E	X
Holm Powerhouse	Cherry Lake South	01N 18E	X
Duckwall Mountain	Duckwall Mountain	01N 17E	
Burnout Ridge	Cherry Lake South	01N 19E	
Cherry Tower Site	Cherry Lake South	01N 19E	X

Oakdale Area

Warnerville Switchyard. The Warnerville Switchyard is located within Stanislaus County off of Warnerville Road southeast of the City of Oakdale, near the base of the Sierra Nevada foothills. This City has a population of approximately 18,500 and is a largely agricultural community (US. Census 2006, City of Oakdale 2006). The site is located within the Raker Act right-of-way, and contains a power sub-station switchyard with existing communication towers, communication and power lines, parabolic dish antennas, and associated structures needed to house equipment to support the facility.

Moccasin Area

Moccasin Peak. The site is currently developed with an existing tower and communication building and is accessed by an existing dirt road. Moccasin Peak is located within Tuolumne County, north of the Hetch Hetchy aqueduct, within the Sierra Nevada foothills, near the intersection of Highways 120 and 49, with Bureau of Land Management (BLM) lands located north and south of the site. HHW&P owns land in fee in the Moccasin Area. This site is within the Raker Act right-of-way.

Moccasin Powerhouse. Moccasin Powerhouse is accessed by an existing paved road. The site is located in Tuolumne County, east of the Moccasin Reservoir, with BLM lands immediately southwest of the site. The site is developed with an existing powerhouse that contains a parabolic dish antenna and associated support structures. Surrounding land uses include the Moccasin Reservoir, HHW&P employee housing to the northeast, existing parking adjacent to the powerhouse, and Lake Don Pedro located to the northwest. HHW&P owns land in fee in the Moccasin Area. This site is within the Raker Act right-of-way.

Moccasin Powerhouse Passive Reflector. Moccasin Powerhouse Passive Reflector is accessed by an existing dirt road. The site is located within forested BLM lands adjacent to Tuolumne County lands to the southwest of the site. This site is currently developed with a passive reflector along the penstock right-of-way east of Moccasin Powerhouse. HHW&P owns land in fee in the Moccasin Area. This site is within the Raker Act right-of-way.

Stanislaus National Forest Sites

Stanislaus National Forest, under the jurisdiction of the US Forest Service, spans four counties and encompasses approximately 898,099 acres and over 800 miles of rivers and streams (USDA 2006a). Stanislaus National Forest is approximately 130 miles from the Bay Area and can be accessed from Highways 4, 108, and 120. Stanislaus National Forest contains the Hetch Hetchy aqueduct west of the Yosemite National Park Boundary. Several of proposed project sites are located along either the aqueduct or near the Tuolumne River, a Wild and Scenic River that is a major recreational destination. The southern area of Cherry Lake, another heavily used recreation area, also contains several proposed sites.

Sites within Raker Act Right-of-Way

Intake Radio Site. The Intake Radio Site is located above a developed switchyard site northwest of the Hetch Hetchy Aqueduct Tunnel and accessed by an existing dirt road. The site is located along an existing transmission line above Intake Switchyard on the route between Intake Switchyard and Moccasin Powerhouse, and currently houses a voice radio repeater and a 900 megahertz (MHz) spread spectrum Supervisory Control and Data Acquisition (SCADA) radio. Existing transmission tower and communication structures are also located there, and the site is surrounded by forested lands.

Intake Switchyard. The Intake Radio Site is located on a developed switchyard site south of the Tuolumne River and accessed by an existing paved road. An existing parabolic dish antenna and associated feed system and 30-foot communication tower are found on this site.

Holm Powerhouse. The Holm Powerhouse is located north of the Tuolumne River and along Cherry Creek and accessed by an existing paved road. Cherry Creek runs through Holm Powerhouse. Immediately south of and below the powerhouse is the Andresen Mine trailhead and parking area, as well as the staging and put-in location for the Upper Tuolumne, or Cherry Creek Run, a popular whitewater boating area (USDA 1988).

Kirkwood Powerhouse. The Kirkwood Powerhouse is accessed by an existing paved road and located north of the Tuolumne River. The Kirkwood Powerhouse is surrounded by a parking lot to the northeast, access road to the north, and HHW&P housing to the west. The Tuolumne River runs along the southern portion of the powerhouse. The terminus of the paved road just east of the powerhouse contains a parking area and trailhead for the Preston Falls hiking trail.

Cherry Lake Sites. The Cherry Lake Sites are accessed from Cherry Lake Road, a paved road that intersects just west of the lake with National Forest Route 14, a paved road that leads west to Sonora. These sites are located within the Stanislaus National Forest, south and southeast of Cherry Lake. Cherry Lake is located approximately three miles north of Burnout Ridge and approximately eight miles west of the Hetch Hetchy Reservoir. Cherry Lake offers a number of recreational uses, such as hiking, swimming, fishing, camping, boating, water skiing and jet skiing. Cherry Lake is approximately 1,800 surface acres and the largest lake in Stanislaus National Forest (USDA 2006b). A very popular dispersed camping area known as Cherry Borrow is located along Cherry Creek directly below Cherry Dam and attracts numerous visitors throughout the summer and fall for camping, hiking, horseback riding, and hunting.

Sites Not within Raker Act Right-of-Way and Subject to US Forest Service Action

Burnout Ridge. The Burnout Ridge Site is located between Cherry Lake and Intake Switchyard and accessed from Cherry Lake Road (Cherry Oil Road). Burnout Ridge is not located within the Raker Act right-of-way. The USFS action for this site would require a Forest Plan amendment and a Special Use Permit.

Duckwall Mountain and Jones Point. Duckwall Mountain and Jones Point are located in the Stanislaus National Forest and each is currently accessed by an existing road. Federal Communications Commission (FCC)-licensed microwave communication equipment at Duckwall Mountain and Jones Point, two existing developed sites currently operated under Special Use Permit with the USFS, would be removed as part of the Proposed Action. These sites each contain a repeater, HHW&P equipment, antennas, and antenna feed system. The Special Use Permit for HHW&P associated with Jones Point would be terminated; the Special Use Permit for HHW&P associated with Duckwall Mountain would remain in place; however, the FCC-licensed microwave communication equipment at both sites would be removed following construction and equipment installation at Burnout Ridge and Intake Radio Sites.

Yosemite National Park Sites

Immediately to the east of Stanislaus National Forest is Yosemite National Park, which is under the jurisdiction of the National Park Service and encompasses approximately 747,956 acres (NPS 2006a). Yosemite National Park is located in central Sierra Nevada and lies 150 miles east of San Francisco, and adjacent to the California-Nevada border. It contains 1,600 miles of streams, 800 miles of hiking trails, and 350 miles of roads, with park visitation of over four million per year. The majority of project sites within Yosemite National Park are located near the western portion of Hetch-Hetchy Reservoir, or in the vicinity of the Tuolumne River.

Sites within Raker Act Right-of-Way

Lake Eleanor Sites. The Lake Eleanor Sites are all located within Yosemite National Park, on the western boundary of Lake Eleanor. Lake Eleanor is located east of Cherry Lake, just inside Yosemite National Park boundaries. Please refer to Section 2.0 for the site location maps.

O'Shaughnessy Dam Sites. The O'Shaughnessy Dam Sites are located within Yosemite National Park to the west and south of the Hetch Hetchy reservoir. These sites comprise a network of facilities located in close proximity to each other that support O'Shaughnessy Dam operations conducted on-site.

Sites Not within Raker Act Right-of-Way

Poopenaut Pass. The Poopenaut Pass Site is located in Yosemite National Park between the Hetch Hetchy Entrance Station and O'Shaughnessy Dam, approximately four miles southwest of the Hetch Hetchy Reservoir. Surrounding land uses in this area include a paved road (O'Shaughnessy Road) and Wilderness lands outside of the road right-of-way. The site is currently undeveloped and not within Wilderness or road rights-of-way. This site is not located within the Raker Act Right-of-Way and would require a right-of-way permit from the NPS.

3.6 IMPACT ANALYSIS

The impact analysis provided in this section includes an assessment against thresholds for NEPA, including interpretations relative to the National Park Service impact assessment requirements. Because of the Environmental Assessment/Initial Study document format, the analysis is presented jointly for NEPA/National Park Service/US Forest Service and CEQA Significance Criteria. Following the detailed analysis, including the presentation of mitigation measures that would avoid or reduce impacts, a summary paragraph is provided to describe the key aspects of both the CEQA and tentative NEPA/National Park Service /US Forest Service analysis. This summary analysis assumes that the mitigating actions would be implemented as described. Each resource-based impact analysis concludes with information on cumulative impacts and the potential for impairment of park resources and values.

3.6.1 NEPA Thresholds

The Director's Order (DO) 12 and the DO-12 Handbook (NPS 2001) for the NPS and US Forest Service Manual (FSM) 1950 - Environmental Policy and Procedures Manual provide guidelines for implementing

NEPA that consider both the regulations established by the CEQ (40 CFR 1500 et seq.) and mandates specific to the NPS and USFS. These guidelines for impact assessments include a discussion of the context, duration, intensity (or magnitude), and type of impact (NPS 2000), as summarized below, and include direct, indirect, and cumulative effects. Within the sections following this introduction, a description as to how these concepts were used is presented for each resource topic.

Context

The context considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within the immediate vicinity of the 32 sites that comprise the Hetch Hetchy Communication System Upgrade Project, unless otherwise noted.

Duration

The duration of an impact is noted as either short-term or long-term and defined in a range of years.

Intensity

Indicators of the intensity of an impact, whether it is negligible, minor, moderate, or major, are included in the impact analysis and are specifically defined in each topic area.

Type

The type of impact refers to whether the effect is considered beneficial or adverse. Beneficial impacts would improve resource conditions. Adverse impacts would deplete or negatively alter resources. Mitigating actions listed in Section 4.0 would be taken during implementation of the action alternatives.

The guidelines for impact assessments will be applied to all NEPA project sites. In addition, the Proposed Action will be evaluated for consistency with applicable general management policies of the NPS and USFS. The impact analysis is based on a comparison of current conditions to evaluate the magnitude of proposed changes, and to assess the environmental effects of these changes.

3.6.2 CEQA Significance Criteria

The CEQA Significance Criteria are based on the CCSF CEQA Initial Study checklist. Significance Criteria are identified under each resource area section.

3.7 COMPATIBILITY WITH EXISTING ZONING AND PLANS

This section identifies and discusses applicable regional and local land use plans and policies relevant to the proposed project, as well as project compatibility with such plans and policies. The focus of this section is the CCSF land use plans and policies. CCSF land use plans and policies are primarily applicable to projects within the jurisdictional boundaries of San Francisco although in some cases they apply to projects outside of San Francisco on City-owned lands, leases, or over which it holds easements. Although the SFPUC is not legally bound to the land use plans and policies of other jurisdictions, non-CCSF land use plans are discussed to the extent that they provide general land use planning information

for the jurisdiction in which the proposed project is located. This information is relevant to evaluate the impacts of the proposed project with respect to the specific significance criteria under CEQA that require an analysis of the compatibility of a proposed project with certain aspects of local land use plans and polices.

The majority of the project sites are located in Tuolumne and Stanislaus Counties on SFPUC-owned land. Eleven of the sites are located in Yosemite National Park and 17 of the site are located in Stanislaus National Forest. Warnerville Switchyard is located in Stanislaus County, while the Moccasin sites are located in Tuolumne County. The Warnerville and Moccasin sites are all within the Raker Act right-of-way and therefore not legally bound to the land use plans and policies of Stanislaus or Tuolumne County jurisdictions.

3.7.1 Regulatory Framework

3.7.1.1 City and County of San Francisco Plans and Policies

The SFPUC is guided by the San Francisco City Charter along with other city plans and policies. These plans include the *San Francisco General Plan*, which sets forth the comprehensive, long-term land use policy for the CCSF, and the *San Francisco Sustainability Plan*, which addresses the long-term sustainability[1] of the city. In addition, the SFPUC has adopted various plans and policies that further direct its activities, including the *Urban Water Management Plan*, and the *Water Enterprise Environmental Stewardship Policy*, which are discussed herein. The *Urban Water Management Plan* is required by the California Urban Water Management Act, California Water Code Division 6, Part 2.6, Sections 10610 through 10656. The purpose of the Act is to ensure that water suppliers plan for long-term conservation and efficient use of California's water supplies. In its Urban Water Management Plan, water suppliers are required to describe and evaluate sources of water supply, efficient water uses, demand management measures, implementation strategy and schedule, and other relevant information and programs (SFPUC 2005). The proposed project relates to the HHW&P communication operations rather than water supply demand and use. Therefore the SFPUC's *Urban Water Management Plan* is not relevant to the proposed project. Other SFPUC plans, such as the *Alameda Watershed Management Plan*, and the *Peninsula Watershed Management Plan*, are not relevant to the study area of the proposed project.

3.7.1.2 Extraterritorial Lands

Although the *San Francisco General Plan* and the *Sustainability Plan* were developed specifically for lands within the jurisdictional boundaries of San Francisco, their underlying goals apply to SFPUC projects on extraterritorial lands. Under the San Francisco City Charter, Section 8B.121, the SFPUC has authority over the management, use, and control of extraterritorial lands, which are properties outside of the city that the CCSF owns or leases or over which it holds easements. Section 8B.121 provides:

[1] Sustainability or sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs.

> Notwithstanding Charter Section 8B.121, the Public Utilities Commission shall have exclusive charge of the construction, management, supervision, maintenance, extension, expansion, operation, use and control of all water, clean water and energy supplies and utilities of the City as well as the real, personal and financial assets, that are under the Commission's jurisdiction or assigned to the Commission under Section 4.132.

California Government Code Section 53090 et seq. provides that the SFPUC receives intergovernmental immunity from the planning and building laws of other cities and counties. The SFPUC, however, seeks to work cooperatively with local jurisdictions where CCSF-owned facilities are sited outside of San Francisco to avoid conflicts with local land use plans and building and zoning codes. Also, the SFPUC is required under Government Code Section 65402(b) to inform local governments of its plans to construct projects or acquire or dispose of its extraterritorial property. The local governments have a 40-day review period to determine project consistency with their general plans. Under this requirement, the cities' or counties' determinations of consistency are advisory to the SFPUC rather than binding.

3.7.2 Applicable Plans and Policies

3.7.2.1 CCSF Plans and Policies

San Francisco General Plan

The *San Francisco General Plan* sets forth the comprehensive, long-term land use policy for the CCSF. One of the basic goals of the general plan is "coordination of the growth and development of the city with the growth and development of adjoining cities and counties and of the San Francisco Bay Region." The general plan consists of 10 issue-oriented plan elements—Air Quality, Arts, Commerce and Industry, Community Facilities, Community Safety, Environmental Protection, Housing, Recreation and Open Space, Transportation, and Urban Design. The plan elements relevant to the proposed project are briefly described below.

Air Quality Element. This element promotes the goal of clean air planning through objectives and policies aimed at adherence to air quality regulations, focusing development near transit services, and advocating alternatives to the private automobile.

Community Safety Element. This element addresses the potential for geologic, structural, and nonstructural hazards to affect city-owned structures and critical infrastructure. The goal of this element is to protect human life and property from hazards.

Environmental Protection Element. This element addresses the impact of urbanization on the natural environment. The element promotes the protection of plant and animal life and fresh-water sources and addresses the responsibility of San Francisco to provide a permanent, clean water supply to meet present and future needs and to maintain an adequate water distribution system.

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added Section 101.1 to the City Planning Code to establish eight Priority Policies. The priority policies are as follows:

1. That existing neighborhood-serving retail uses be preserved and enhanced and future opportunities for resident employment in and ownership of such businesses enhanced.

2. That existing housing and neighborhood character be conserved and protected in order to preserve the cultural and economic diversity of our neighborhoods.

3. That the city's supply of affordable housing be preserved and enhanced.

4. That commuter traffic not impede MUNI transit service or overburden our streets or neighborhood parking.

5. That a diverse economic base be maintained by protecting our industrial and service sectors from displacement due to commercial office development, and that future opportunities for resident employment and ownership in these sectors be enhanced.

6. That the city achieve the greatest possible preparedness to protect against injury and loss of life in an earthquake.

7. That landmarks and historic buildings be preserved.

8. That our parks and open space and their access to sunlight and vistas be protected from development.

Overall, the policies of the *San Francisco General Plan* were developed for lands within San Francisco, and most are not directly relevant to the SFPUC or its extraterritorial lands.

San Francisco Sustainability Plan

The *San Francisco Sustainability Plan* was endorsed by the San Francisco Board of Supervisors in 1997, although the Board of Supervisors has not committed the city to perform the actions addressed in the plan. The plan serves as a blueprint for sustainability, with many of its individual proposals requiring further development and public comment. The underlying goals of the plan are to maintain the physical resources and systems that support life in San Francisco and to create a social structure that will allow such maintenance. It is divided into 15 topic areas, 10 that address specific environmental issues (Air Quality; Biodiversity; Energy, Climate Change and Ozone Depletion; Food and Agriculture; Hazardous Materials; Human Health; Parks, Open Spaces and Streetscapes; Solid Waste; Transportation; and Water and Wastewater), and five that are broader in scope and cover many issues (Economy and Economic Development; Environmental Justice; Municipal Expenditures; Public Information and Education; and Risk Management). Each topic area in the plan has a set of indicators that are to be used over time to determine whether San Francisco is moving in a sustainable direction in that particular area. Consistency of the proposed project with the *San Francisco Sustainability Plan* is discussed below.

SFPUC Water Enterprise Environmental Stewardship Policy

Adopted in June 2006, the *Water Enterprise Environmental Stewardship Policy* established the long-term management direction for CCSF-owned lands and natural resources affected by operation of the SFPUC

water system within the Tuolumne River, Alameda Creek, and Peninsula watersheds (SFPUC 2006a). It also addresses rights-of-way and properties in urban surroundings under SFPUC management. The policy includes the following:

- The SFPUC will proactively manage the watersheds under its responsibility in a manner that maintains the integrity of the natural resources, restores habitats for native species, and enhances ecosystem function.
- To the maximum extent practicable, the SFPUC will ensure that all operations of the SFPUC water system (include water diversion, storage, and transport), construction and maintenance of infrastructure, land management policies and practices, purchase and sale of watershed lands, and lease agreements for watershed lands protect and restore native species and the ecosystems that support them.
- Rights-of-way and properties in urban surroundings under SFPUC management will be managed in a manner that protects and restores habitat value where available, and encourages community participation in decisions that significantly interrupt or alter current land use in these parcels.

The Environmental Stewardship Policy will be integrated into SFPUC Water Enterprise planning and decision-making processes and also directly implemented through a number of efforts (SFPUC 2006a). Below are examples of areas for integration and specific activities that will further the goals of this policy applicable to the proposed project.

- Active participation in local forums, including coordination with Yosemite National Park Service and Stanislaus National Forest in the Tuolumne River watershed, the Tuolumne River Technical Advisory Committee, the Alameda Creek Fisheries Restoration Workgroup, the Pilarcitos Creek Restoration Workgroup, and the Lake Merced Task Force.
- Ensure that the policy guides development of project descriptions, alternatives and mitigation for all SFPUC projects during the environmental review process under CEQA and/or NEPA.
- Seek support for and encourage all employees to integrate environmental stewardship into daily operations through communication and training.

Other Land Use Plans and Policies

Several federal, state, and regional agencies have adopted land use plans that establish guidelines regarding appropriate land uses and activities within the boundaries of their respective plans. The Yosemite National Park *General Management Plan* and the Stanislaus National Forest *Forest Plan Direction July 2005* (Forest Plan as amended) are the guiding documents for the Hetch Hetchy Communication System Upgrade EA/IS for the sites that are not within the Raker Act right-of-way and on federal lands. The Proposed Action is not part of the SFPUC WSIP, which would repair, replace, and seismically upgrade the system's aging pipelines, tunnels, reservoirs, pump stations, storage tanks, and dams.[2]

[2] Please note: the WSIP refers to what this project refers to as Cherry Lake as Lake Lloyd, and the dam as Cherry Dam.

General Land Use Plans and Policies of Other Jurisdictions

This section describes the local and regional land use plans adopted by other jurisdictions that would be applicable to the proposed project. Although the SFPUC is not legally bound to the land use plans and policies of other jurisdictions, non-CCSF land use plans are discussed in this section to the extent that they provide land use planning information for the jurisdictions in which the proposed project is located. This information is relevant to evaluate the impacts of the proposed project with respect to the specific significance criteria under CEQA that require an analysis of the compatibility of a proposed project with certain aspects of local land use plans and polices. These particular significance criteria are listed below along with the location in this chapter where the reader can find the impact evaluation:

- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan (Analyzed in Section 3.10.9, Mineral and Energy Resources)
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Analyzed in Section 3.8.3, Vegetation)
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. (Analyzed in Section 3.8.5, Rare, Threatened and Endangered Species)
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., conflict with policies promoting bus turnouts, bicycle racks, etc.), or cause a substantial increase in transit demand that cannot be accommodated by existing or proposed transit capacity or alternative travel modes (Analyzed in Section 3.10.4, Transportation)
- Expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Analyzed in Section 3.8.7, Noise and Vibration)
- For a project located within an area covered by an airport land use plan (or, where such a plan has not been adopted, within two miles of a public airport or public use airport), expose people residing or working in the project area to excessive noise levels (Analyzed in Section 3.8.7, Noise)
- Conflict with existing zoning for agricultural use or a Williamson Act contract (Analyzed in Section 3.10.10, Agricultural Resources)

General Plans

General plans are long-range public policy documents prepared for the purpose of guiding the use and future development of private and public lands within the boundaries of a given jurisdiction. General plans represent that jurisdiction's official position on development and resource management. California planning law (Government Code Sections 65302–65303) requires that each city or county in the state develop and adopt a general plan. The general plan must address seven subjects: land use, circulation, housing, conservation, open space, safety, and noise. It may also contain elements that the city or county wishes to adopt.

The project sites are in Tuolumne and Stanislaus Counties, located on extraterritorial lands owned by the CCSF and managed by the SFPUC, and thus would not be legally bound to the policies contained in the

general plans for these jurisdictions. One of the sites is located within Stanislaus County, while 27 are located within Tuolumne County. However, most of the 27 sites in Tuolumne County are on federal lands of the National Park Service or the US Forest Service. However, the underlying goals of city or county general plans are presented herein.

Tuolumne County General Plan

The Tuolumne County General Plan is intended to guide growth and development in a way that balances the needs of the individual with the needs of all of the County's residents by encouraging economic growth, promoting the stewardship of natural resources and advocating respect for the County's historical heritage (Tuolumne County 1996). The General Plan contains policies aimed to protect certain habitats, implementation of noise reduction measures during construction activities, and appropriate seismic design and construction of important facilities.

Stanislaus County General Plan

The Stanislaus County General Plan contains goals and policies to guide future growth such that its agricultural base is maintained and natural resources are protected through avoidance or mitigation measures.

Other Regional Plans

Habitat Conservation Plans

Habitat Conservation Plans (HCPs) provide comprehensive, long-term conservation measures for species listed as threatened or endangered under the California and Federal Endangered Species Acts, or for species that could be listed in the future. There are no HCPs in Tuolumne or Stanislaus Counties, and therefore none are applicable to this project.

3.7.3 Impacts

3.7.3.1 Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to plans and policies, but generally considers that implementation of the proposed program would have a significant impact if it were to:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over one or more components of the program (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or,
- Conflict with any adopted plans and goals of the City or Region, if applicable.

As stated above, certain CEQA significance criteria are also relevant to the land use plans and policies impact evaluation. These criteria are evaluated under each resource area of this chapter as follows: Section 3.8.1, Geology, Geohazards and Soils; Section 3.8.5, Rare, Threatened and Endangered Species; Section 3.10.4, Transportation; Section 3.8.4, Air Quality; Section 3.8.7, Noise; and Section 3.10.10, Agricultural Resources.

3.7.3.2 Approach to Analysis

The evaluation of plan consistency is based on the applicability of relevant land use plans and policies to the proposed project as they relate to:

- The underlying goals of the San Francisco General Plan and Sustainability Plan and the Water Enterprise Environmental Stewardship Policy
- Federal, state, or regional land use plans and policies applicable to the project where these agencies hold easements

As stated above, the San Francisco General Plan and Sustainability Plan are primarily applicable to projects located in San Francisco; however, they may also be applicable to projects on SFPUC extraterritorial land.

For these plans, a determination of potential consistency was made as required by Section 15125(d) of the CEQA Guidelines. However, because the policy language found in a land use plan is susceptible to varying interpretations, it is often difficult to determine whether a proposed project is consistent or inconsistent with such policies. Further, because land use plans often contain numerous policies emphasizing differing legislative goals, the project may be "consistent" with a general plan, taken as a whole, even though they may appear to be arguably inconsistent with specific policies within the plan. The board or commission that enacted the plan or policy generally determines the meaning of such policies; these interpretations prevail if they are "reasonable," even though other reasonable interpretations are also possible. In light of these considerations, the consistency evaluation in this Initial Study represents the best attempt to advise the decision-makers as to whether the proposed project is consistent with applicable land use plans and policies.

3.7.4 Plan Consistency Evaluation

3.7.4.1 Consistency with San Francisco Plans and Policies

San Francisco General Plan

As described above, the San Francisco General Plan addresses elements such as air quality, community safety (including protection from geologic and seismic hazards), environmental protection (including protection of water resources, biological resources, and other natural resources as well as addressing construction-related noise and ambient air quality), and urban design (including protection of historical and visual resources). The project would be consistent with the San Francisco General Plan by complying with applicable regulations and reducing any potentially significant impacts with the incorporation of mitigation measures and Best Management Practices.

San Francisco Priority Policies

As discussed in Section 3.7.2.1, the policies of the *San Francisco General Plan* were developed for lands within San Francisco, and most are not directly relevant to the SFPUC or its extraterritorial lands. The proposed project would not alter or destroy any historic buildings or landmarks in SFPUC's

extraterritorial lands. The proposed upgrades at existing sites and construction of new communication sites would not limit sunlight or significantly impact vistas in Yosemite National Park, Stanislaus National Forest, or Stanislaus and Tuolumne Counties.

San Francisco Sustainability Plan

The *San Francisco Sustainability Plan* was developed for the purpose of addressing San Francisco's long-term environmental sustainability. The project would be consistent with the goals of the Sustainability Plan since it would provide the foundation infrastructure and bandwidth to allow for future installation of voice radio and video systems. This in turn would allow for the future possibility to improve the communication system to expand coverage into the Lake Eleanor, O'Shaughnessy Dam, and Cherry Lake areas. The foundation infrastructure could allow for the future possibility of improved communication reliability for the health and safety of staff and emergency response, and dam and facility security in the future. The HHW&P communication system is important to the SFPUC operations, which provides water to the San Francisco Bay Area. SFPUC's water system and HHW&P's operations serve an important function by supporting life in San Francisco by providing water. The project would be consistent with the goals of the Sustainability Plan by maintaining the physical resources and systems that support life in San Francisco.

3.7.4.2 Consistency with SFPUC Plans and Policies

SFPUC Water Enterprise Environmental Stewardship Policy

The project would be consistent with the goals of the Sustainability Plan since it would provide the foundation infrastructure and bandwidth to allow for future installation of voice radio and video systems. This in turn would allow for the future possibility to improve the communication system to expand coverage into the Lake Eleanor, O'Shaughnessy Dam, and Cherry Lake areas. The foundation infrastructure would enable improved communication reliability for the prospective health and safety of staff and visitors, for emergency response, and dam and facility security. The HHW&P communication system is important to the SFPUC operations, which provides water to the San Francisco Bay Area. SFPUC's water system and HHW&P's operations serve an important function by supporting life in San Francisco by providing water. The project would be consistent with the goals of the Sustainability Plan by maintaining the physical resources and systems that support life in San Francisco.

3.8 NATURAL RESOURCES

The analysis of natural resources includes Geology; Geohazards and Soils; Hydrology; Floodplains; and Water Quality; Wetlands; Vegetation; Wildlife, Rare, Threatened and Endangered Species; Air Quality; and Noise.

3.8.1 Geology, Geohazards and Soils

3.8.1.1 Affected Environment

This section describes the existing geology, faulting and seismicity, and rockfalls setting of the Hetch Hetchy Communication System Upgrade project site areas.

Geology

Oakdale Area Site (Warnerville Switchyard)

The Warnerville Switchyard site is located in Stanislaus County near the base of the Sierra Nevada foothills, about 2.5 miles southeast of the City of Oakdale, just south of the Hetch Hetchy aqueduct. This is the westernmost of all the project sites, and is located at an elevation of about 200 feet above sea level. The site is located in the Great Valley Physiographic Province, which is a deep structural basin filled with Cretaceous through Holocene sediments (URS 1989). The sediments overlie igneous and metamorphic basement in the vicinity of Modesto, and are approximately 11,000 feet thick. The Great Valley is bounded to the east by the Sierra Nevada structural block, which consists of predominately Mesozoic granitic, metamorphic, and volcanic rocks; and to the west by the folded and faulted Coast Ranges province. The Sierra Nevada block has been rotated along a generally north-south axis, so that the eastern side of the block is structurally high, and the western portion has been downdropped to form the basement of the eastern Great Valley.

Moccasin Area Sites

The Moccasin Area sites are located within the Sierra Nevada foothills, near the intersection of Highways 49 and 120. The three sites in this area are located at elevations ranging from 1,000 to 3,000 feet. The Moccasin Area is situated within the western (foothill) portion of the Sierra Nevada tectonic block. The geology of the site is comprised principally by metamorphosed basic and ultrabasic rocks which were extensively sheared and faulted during late Paleozoic and Mesozoic times. The entire tectonic block was then uplifted and tilted westward, during late Cenozoic (Pliocene to Holocene time, i.e., the last 10 million years). As described below, it appears that the younger and youngest occurrences of faulting (last ten million and one million or fewer years) have tended to be associated with the major Mesozoic fault zones which traverse the Sierran foothills from southeast to northwest.

Except for its eastern frontal escarpment, the Sierra Nevada block is characterized by low to extremely low historic seismicity (since around 1900, by which time fairly good record keeping had begun). This is documented by the Earthquake Epicenter Map of California (Real, Toppozada, and Parke, 1978).

Sierra Nevada Sites (Stanislaus National Forest and Yosemite National Park area)

The Sierra Nevada sites include all communication facility sites except those located in the Moccasin and Oakdale Areas and are located at elevations ranging from between 3,000 and 5,000 feet. The Sierra Nevada, Yosemite National Park and its vicinity are well known for their granitic bedrock formations. However, the term granitic has been loosely applied to the plutonic (igneous) rocks of the Sierra Nevada batholith and actually represents rock types including diorite, granodiorite, tonalite, and granite of Cretaceous age (100 to 65 million years ago) (NPS 2003). The Sierra Nevada batholith is comprised of

numerous individual rock bodies that were formed from many episodes of magmatic intrusions within the earth's crust. Approximately 70 million years ago the earth's crust overlying the plutonic intrusions eroded and the Sierra Nevada batholith became exposed at the earth's surface. Roughly 50 million years ago, the granite bedrock had become eroded and formed gentle rolling hills with a topographic relief of a few thousand feet.

The underlying bedrock of the Sierra Nevada sites consists of coarse grained granites and granodiorites. Both bedrock types are igneous and relatively resistant to weathering. These bedrock types are metamorphic and are remnants of ancient sedimentary and volcanic rocks that were deformed and metamorphosed, in part by granitic intrusions.

Three well-documented glacial events have occurred in the Sierra Nevada, all of which have impacted the geomorphology of the region. The most significant and first glacial event may have lasted as long as 300,000 years and ended approximately one million years ago. Glaciation of this time period is classified as Sherwin-age and is credited with shaping Yosemite Valley. Subsequent glacial events consisted of the Tahoe and Tioga glaciations, which likely occurred about 130,000 and 20,000 years ago. However, neither event generated glaciers as significant, in lateral extent or depth, as the Sherwin-age glacier. Based upon glacial evidence in the Sierra Nevada, the Tahoe-age glacier probably extended farther west and was of greater thickness than the Tioga-age glacier of Yosemite Valley. However, its actual extent is unknown.

Faulting and Seismicity

Faults nearest to Warnerville Switchyard include the Melones and Bear Mountains fault zones of the Foothills fault system, on which minor normal displacement of Quaternary to recent age has occurred. The largest historic earthquake centered within the Foothills fault system was a Richter magnitude 5.7 in the Oroville sequence. No moderate or large earthquakes have occurred on the Foothills fault system in the vicinity of the Oakdale area in recent time. The Richter magnitude of the maximum credible earthquake on the central portion of the Foothills fault zone is 6.25, and the estimated recurrence interval is 10,000 years. The recurrence interval of lesser seismic events such as the magnitude 5.7 Oroville quake, is estimated to be approximately 1,000 years. No estimates are available of the Modified Mercalli intensities likely to be experienced at the proposed water treatment facility sites as a result of maximum credible or lesser seismic events on the central Foothill fault zone.

The Sierra Nevada block is bounded to the east by normal faults in the Owens Valley, one of which produced a Richter magnitude 8.25 earthquake in 1872, centered approximately 150 miles southeast of Modesto. Major structures west of Warnerville Switchyard include the San Andreas fault zone approximately 75 miles southwest of the study area, and the Hayward fault about 60 miles to the southwest. Major historic earthquakes have occurred along both structures. Maximum credible Richter magnitudes are 8.3 on the San Andreas and 7.5 on the Hayward fault. Modified Mercalli Intensities of V to VII were experienced in the study area during the 1906 earthquake. Damage to well-designed and properly constructed buildings as a result of these Modified Mercalli Intensities is negligible. Pipelines may be susceptible to greater damage at high Modified Mercalli Intensities than more conventional structures. The San Andreas fault zone and the Hayward fault are believed to have the shortest average

recurrence intervals among the structures that could produce significant seismic shaking in the vicinity of the study area, and are the most likely sources of ground shaking in the region.

There are several faults known to exist within Stanislaus County (City of Modesto, County of Stanislaus 2004). In the extreme eastern parts of the County, in the general vicinity of the Oakdale Area, the Bear Mountain and Melones faults are found, though believed to have been inactive for the past 150 million years. No faults are currently known to exist within the valley portion of Stanislaus County. Within the Diablo Range, the most recent movements were along the Tesla-Ortigalita fault approximately five million years ago, although earthquake activity without surface fracturing or faulting is still common. Since 1930, one earthquake epicenter of a magnitude greater than 4.0 on the Richter Scale was recorded in Stanislaus County. On June 27, 1986 an earthquake with a magnitude of 3.7 on the Richter Scale occurred with an epicenter several miles west of Crows Landing. Future earthquakes of similar or greater magnitudes can be expected.

The Sierra Nevada Range in the vicinity of Yosemite National Park is not considered an area of particularly high seismic activity (City of Modesto, County of Stanislaus 2004). Throughout recorded history, most earthquakes of Richter magnitude 5 or above have been centered in the eastern Sierra Nevada or in the southern and western portions of California. A relatively small number of earthquakes over magnitude 5, but many earthquakes under magnitude 5, have been generated in the Sierra Nevada batholith. No active or potentially active faults have been identified in the mountain region of Yosemite National Park. Therefore, the risk of fault rupture or surface displacement beneath the Sierra Nevada sites is negligible.

Yosemite can undergo seismic shaking (ground shaking) associated with earthquakes on fault zones on the east and west margins of the Sierra Nevada. Active fault zones in the vicinity of Yosemite include the Bear Mountains fault zone, Sierra Nevada fault zone (including Mono Lake and Hartley Springs faults), seismically and volcanically active areas of the Mono Craters-Long Valley Caldera (including Hilton Creek fault), and various faults within the Owens Valley fault zone.

The active Rescue Lineament-Bear Mountains fault extends in a north-south direction within the western foothills of the Sierra Nevada, approximately 60 miles west of Yosemite Valley. The Mono Lake fault is approximately 35 miles northeast of Yosemite Valley and lies along the northern border of the Mono Craters-Long Valley Caldera region. Over the last 12 years, the Mono Craters-Long Valley Caldera has been one of the most seismically active regions in California.

Earthquakes have been attributed to movement on the Mono Lake fault and movement associated with resurgent volcanic activity of the Long Valley Caldera. The Mono Craters last erupted 600 years ago and are considered geologically recent. The South Fork Bridge is distant enough to avoid all but ash fall from an eruption in the Long Valley Caldera region. In October 1990, the Mono Lake fault experienced a 5.7 Richter movement. This earthquake was felt as far west as Sacramento and the San Francisco Bay Area, and caused landslides and rockfalls at Tioga Pass on the Big Oak Flat Road.

The Owens Valley fault, located approximately 100 miles southeast of Yosemite Valley, has experienced movement within the last 200 years, and the California Division of Mines and Geology considers this

fault active. The most notable earthquake recorded in Yosemite National Park was the Owens Valley earthquake of March 26, 1872, which is estimated to have had a Richter magnitude of 7.6 and was one of the largest earthquakes in US history. This earthquake reportedly caused damage in the Sacramento and San Joaquin Valleys and caused significant rockfalls in Yosemite Valley. Although earthquakes that are felt by people in Yosemite National Park are relatively infrequent, they have occurred in the past and will likely occur in the future.

Rockfalls

Rockfall is used as a generic term to refer to all slope movement processes, including rockfall, rockslide, debris slide, debris flow, debris slump, and earth slump (City of Modesto, County of Stanislaus 2004). Rocks have become dislodged and fallen off the sheer granite cliffs throughout the geologic history of Yosemite. Rockfalls can displace large volumes of rock and can occur due to such processes as the climate-related expansion and contraction of rock, seismic shaking, or exfoliation.

Most rockfalls are associated with triggering events such as earthquakes, rainstorms, or periods of warming that produce a rapid melting of snow. The magnitude and proximity of the earthquake, intensity and duration of the rainfall, the thickness of the snow-pack, and the pattern of warming, all influence the triggering of rockfalls. However, some rockfalls occur without a direct correlation to an obvious event and are probably associated with gradual stress release and exfoliation of the granitic rocks.

The frequency and magnitude of rockfall events vary considerably. Many small rockfalls may occur every year and go unnoticed, while larger rockfalls occur much less frequently. The NPS, in cooperation with the US Geological Survey (USGS), is currently identifying potential geologic hazards in developed areas, including areas most susceptible to rockfalls. The NPS is revising its management policies regarding geologic hazards, with the intent to better protect park visitors and staff by avoiding placement of structures in areas with a high potential for rockfall impact. The vicinity of the Sierra Nevada sites does not have steep slopes or exposed bedrock surfaces and is not considered to be in an area of rockfall hazards (City of Modesto, County of Stanislaus 2004).

Soils

Soils form as a result of the combined effect of several factors, including parent material, climate, biologic activity, topographic position/relief, and time. Topography influences surface runoff, groundwater, the distribution of stony soils, and the separation of various-aged alluvial soils.

Oakdale Area Site (Warnerville Switchyard)

The soil type in this area is Keyes cobbly clay loam (KeB), it is a clayey soil that is characterized by gravelly alluvium derived from valley fill sediments consisting of andesitic gravel, cobbles and tuff (NRCS 2006). This soil type has low water capacity, is well draining and generally is found in areas with 0 to 8% slopes. The area is adjacent to an area of Peters clay soil (PtB), which is characterized by residuum weathered from volcanic sandstone. This soil type is well draining, has a low water retention capacity, and bedrock can usually be found 12 to 20 inches below the surface.

Moccasin Area Sites

Soil types predominantly found in this area include the Delpiedra Series, Henneke Series, Auburn Series, and Whiterock Series. The Delpiedra soils are generally a reddish brown, stony loam. Henneke soils are clayey-skeletal and consist of shallow, well drained soils that formed in material weathered from serpentine and similar rocks. The Auburn soils are loamy, and consist of shallow to moderately deep, well drained soils founds in material weathered from amphibolite schist. Whiterock soils are loamy, and consist of very shallow and shallow, somewhat excessively drained soils formed in material weathered from metasedimantary rocks. These soils are generally located on steep slopes in areas characterized as mountainous uplands, as well as undulating to very steep foothills. They are well drained, with low to very high runoff and moderate permeability (NRCS 2006). The sites are underlain by alluvium consisting of clayey gravel and sandy gravel, underlain by alluvial deposits of clayey gravel with boulders and cobbles (CCSF 1992). Bedrock of weathered shale was encountered at depths of about 15 feet to 16 feet below the existing ground surface and extended to the depth explored.

Sierra Nevada Sites (Stanislaus National Forest and Yosemite National Park area)

Soils of the Yosemite National Park region are primarily derived from underlying granitic bedrock and are of similar chemical and mineralogical composition. Colluvial soils have developed along the edges of cliffs where landslides and rockslides have occurred and are composed of various-sized rocks that have high rates of infiltration and permeability. Weathering processes break down talus to smaller-sized particles that are then transported by water and eventually become deposited in alluvial fans or in stream channels. Soils that formed in old river channels consist of alluvial boulders, cobbles, river wash, and loamy sands. These soils have, for the most part, moderate to severe development limitations and thus require the implementation of engineering and mitigation measures. Soil types consist primarily of residual soils on slopes and alluvial soils on the valley floor. Soil depths vary from two feet to four feet in thickness and are moderately to strongly acidic.

Poopenaut Pass, Burnout Ridge, and Cherry Tower Site would involve a greater degree of ground disturbance than the existing sites, as it would involve site preparation. Intake Radio Site is an existing site; however, site preparation would be required to expand the area to accommodate the new communication shelter and tower. This site is generally underlain by Holland series, which is residuum weathered from granite. This soil type has low water capacity, is well drained, and generally found in areas with 10 to 35% slopes (NRCS 2006).

The Poopenaut Pass site area is generally underlain by rock outcrop composed of humic dystroxerepts-humic lithic haploxerepts association which is derived from granitoid rock (NRCS 2006). This soil type has very low water capacity, is well drained, and generally found in areas with 0 to 30% slopes (NRCS 2007).

The Burnout Ridge and Cherry Tower sites are generally underlain by Wintoner-Tallac series, which is derived from granite (NRCS 2006). This soil type has low to high water capacity, is well drained, and is found in areas with 15 to 40% slopes (NRCS 2006). Burnout Ridge and Cherry Tower sites are generally underlain by tonalite (granite-like rock) bedrock assigned to the Poopenaut Valley unit (EFGS 2006a and 2006c).

3.8.1.2 Thresholds of Significance

CEQA Significance Criteria

The CCSF has not formally adopted significance standards for impacts related to geology and soils, but considers that implementation of the proposed project would have a significant impact if it were to:

- Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving (i) rupture of a known earthquake fault, (ii) strong seismic ground shaking, (iii) seismic related ground failure including liquefaction, or (iv) landslides;
- Result in substantial soil erosion or loss of top soil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code, creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
- Change substantially the topography or any unique geologic or physical features of the site.

NEPA Thresholds (National Park Service/US Forest Service Sites)

This impact assessment focuses on effects that geologic processes could have on people and facilities within the boundaries of Yosemite National Park and Stanislaus National Forest. Geologic processes negatively affect people and facilities when events such as earthquakes and severe soil instability result in injury, death, or damage to facilities. Project-related actions could affect soil resources through accelerated erosion, soil loss, or soil removal. The majority of the upgrades proposed would occur within existing developed areas or structures. However, the Proposed Action would require site preparation and new construction at the Poopenaut Pass, Burnout Ridge, Cherry Tower, and Intake Radio Sites. Therefore, the environmental consequences will focus primarily on these sites, where new construction would occur.

Several assumptions regarding facility placement, geologic design parameters, and public safety were integrated into this assessment, as summarized below.

- Geologic risks to public safety are rarely predictable, and the extent of potential harm to people and property cannot be quantified. While the project sites are not prone to earthquakes or rockfalls, it is not possible to avoid risks due to geologic hazards.
- Geotechnical studies to determine soil stability conditions would be performed prior to placing, designing, or relocating communication facilities at the four sites where ground disturbance would occur. Facility design would conform to accepted building codes, particularly regarding seismic design parameters.
- Soil compaction could occur as a result of project construction activity. Soil compaction reduces infiltration rates, thereby increasing surface runoff and the potential for erosion. Deep compaction of soils could impede subsurface flow. In turn, these effects could alter soil chemical processes

such as nutrient transfer, biological processes such as root development and microbial patterns, and physical processes such as soil structure. Vegetation growth on compacted soils is often limited due to low infiltration and poor root penetration.

- Removal of vegetation through project activities or pedestrian use could result in accelerated erosion of the soil surface. Soils on steep slopes and along watercourses are especially susceptible to erosion.

Duration of Impact

The duration of soils impacts is characterized as short-term or long-term. Short-term impacts could be restored when project construction is completed and are considered to last 20 years or less. Long-term impacts were considered to last over 20 years.

Intensity of Impact

Impact intensity was characterized as negligible, minor, moderate, or major. Negligible impacts would be imperceptible or not detectable. Minor impacts would be slightly perceptible and localized. Moderate impacts would be apparent and have the potential to become larger. Major impacts would be substantial, highly noticeable, and may be permanent.

Type of Impact

All seismic events are potentially hazardous. The type of impact is related to risk, and it is difficult to estimate risk involving natural events. In general, reducing risk is considered a beneficial impact. Generally, maintaining facilities within or moving facilities into a zone of higher risk or exposing people to greater levels of risk is considered adverse.

Soils

Types of soil impacts include soil removal, soil profile mixing, soil compaction, soil erosion, and soil contamination. Activities that may result in soil impacts include the installation of communication facilities, construction of buildings, parking areas and roads.

Soil Removal. Paving activities and construction remove and cover the soil surface and can result in changes to basic soil properties. Excavation and removal of the soil surface would result in a long-term impact because the basic soil properties, which have taken thousands of years to develop, would have been removed. Covering the surface reduces water movement and minimizes the opportunity for the normal physical and chemical soil processes.

Soil Profile Mixing. Soil excavation and redistribution results in removal or mixing of the soil profile and disrupts soil structural characteristics, interrupting the chemical, physical, and biological processes that naturally occur in the soil. The level of change is dependent on the level of the alteration. It may take many decades to redevelop the soil profile.

Soil Compaction. Soil compaction may occur as a result of construction activities. Soil compaction reduces infiltration rates, thereby increasing surface runoff and the potential for erosion. Deep compaction of soils may impede subsurface flow. In turn, these effects could alter soil chemical processes such as nutrient transfer, biological processes such as root development and microbial patterns, and physical processes such as soil structure. Vegetation growth on compacted soils is often limited due to low infiltration and poor root penetration.

Soil Erosion. Removal of vegetation through grading activities may result in accelerated erosion of the soil surface. Soils on steep slopes and are especially susceptible to erosion.

Soil Contamination. The addition of chemical constituents into the soils as a result of construction activities, untreated runoff from paved surfaces, or from incidental spills, may alter micro- or macro-organism populations, diversity, and dynamics. Machinery involved with construction activities may deposit small amounts of natural and synthetic petrohydrocarbons onto soils through equipment failure or normal operations.

3.8.1.3 Environmental Consequences

Environmental Consequences of Alternative 1 (No Action)

The No Action Alternative maintains the status quo at all communication facility sites. This alternative provides a basis to compare the action alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Under this alternative, all communication sites would remain in their current state. No new impacts to geology, geohazards, or soils would be associated with this alternative.

Environmental Consequences of Alternative 2 (Preferred Alternative)

Alternative 2 would involve a proposed communication system upgrade project at 32 communication facility sites operated by HHW&P. For the majority of the sites, the upgrades would involve replacement or installation of communication equipment in such a manner that ground disturbance would not occur. Existing communication towers would remain in use, or new towers would be added at some sites with existing towers. All new equipment would be installed on the new towers. At four of the 32 sites, project implementation would involve a greater degree of ground disturbance than the others. Poopenaut Pass, Burnout Ridge, and Cherry Tower sites would involve site preparation because these are new sites. Intake Radio Site is an existing site; however, site preparation would be required to expand the area to accommodate the new communication shelter and tower. Ground disturbance at the other sites would be minimal and limited to trenching to install fiber optic cable. None of the project alternatives would require the use of septic tanks or alternative wastewater disposal systems. Thus, this issue is not discussed further in this analysis.

Impacts associated with the project are evaluated based on their context, duration, intensity and type. The following tables and discussion provide information regarding the nature of impacts from the proposed project as they relate to geology and soils.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	Local	Short-Term	Negligible	Adverse	LS

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse	MPH	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse Passive Reflector	MPR	Local	Short-Term	Negligible	Adverse	NI
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Oakdale and Moccasin Area Sites

Implementation of proposed communication facility upgrades at the Oakdale and Moccasin Area sites would take place within existing developed areas. Communication tower foundation preparation at Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse would require the removal of existing asphalt paving where the new tower would be located, followed by the construction of the new tower foundation. Equipment that may be used at these sites includes backhoes, excavators, compactors, concrete trucks, cranes, and augers.

Ground disturbance would be short-term and for the duration that the new tower foundation is installed at Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse. There would be no long-term impacts to geologic resources as a result of the upgrades at these sites. The proposed upgrades would not change the topography or result in soil erosion or loss of top soil because they are already developed areas. These sites are not located on an unstable geologic unit or soil, along an earthquake fault, in a liquefaction or landslide zone. Impacts to geology and soils would therefore be less than significant. Ground disturbance or new construction would not occur at the Moccasin Powerhouse Passive Reflector site, as it involves only the removal of the passive reflector. Therefore, no impacts to geologic resources would occur at the Moccasin Powerhouse Passive Reflector site.

Though the Warnerville Switchyard and Moccasin Areas are not areas where seismic activity has generally been highly common or severe, these areas are nevertheless vulnerable to occasional seismic activity and to its potential harmful effects. Construction of all facilities would be in accordance with current seismic engineering requirements which are part of the Uniform Building Code (UBC) and California Building Code (CBC). The UBC and CBC establish the building and structural requirements that the facilities must meet.

Impact Determination (Oakdale and Moccasin Areas)**:**

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Dam Diversion Tunnel	ODT	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Stream Gauge	OSG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Quality Building	OWQ	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Chalet (Cottage 1)	OC1	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Bunkhouse	OBH	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Tanks	OWT	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor-Cherry Lake Tunnel	ECT	Local	Short-Term	Negligible	Adverse	NI
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Short-Term	Moderate	Adverse	LSM
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

Implementation of proposed communication facility upgrades at the O'Shaughnessy and Lake Eleanor Areas would take place within existing developed areas. Minimal ground disturbance would occur at the Lake Eleanor-Cherry Lake Tunnel site; however, no impact to geologic resources would result from construction activities. Minor earthwork would be required at the Lake Eleanor-Cherry Lake Tunnel project site as a new concrete pad will be installed to support the new communication enclosure at this site. Approximately 24 square feet (sq. ft.) of ground disturbance would occur for the installation of the concrete equipment pad. This pad and enclosure will be installed adjacent to the existing United States Geologic Service (USGS) enclosure at this site. Ground disturbance would be short-term, only for the duration that the equipment pad is installed. See Figure 3.10.2-14 of this document. Though the O'Shaughnessy and Lake Eleanor Areas are not areas where seismic activity has generally been highly common or severe, these sites are nevertheless vulnerable to occasional seismic activity and to its potential harmful effects. Construction of facilities in accordance with current seismic engineering requirements would result in a local, short-term, negligible, adverse impact related to geologic resources. There would be no long-term impacts to geologic resources as a result of the upgrades at these sites. The proposed upgrades would not change the topography or result in soil erosion or loss of topsoil because they would affect existing developed areas. These sites are not located on an unstable geologic unit or soil, along an earthquake fault, in a liquefaction or landslide zone. No impacts to geologic resources would occur.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas)**:**

CEQA: No impact.

NEPA: Local, short-term, negligible, adverse impact.

Poopenaut Pass

The Poopenaut Pass site is located on a steep rock outcropping and generally located on hard granite. The approximate locations of the tower and communication shelter are covered with sparse vegetation and granitic cobbles and boulders (EFGS 2006a). A geologic hazards evaluation prepared for this site found loose granitic boulders associated with bold outcrops of glacially polished granite surrounding the selected site location (EFGS 2006a). The outermost couple of inches of some of these outcrops were observed to be spalling and expanding in thin sheets, which is a characteristic weathering pattern of plutonic rocks (EFGS 2006a). Ground disturbance at this site would involve approximately 2,238 sq. ft. for the communication site, and approximately 6,303 sq. ft. for the access trail. Due to the site's topography, there is no flat location in which to place a proposed communication shelter and communication tower. Therefore, two options would be considered: (1) create a flat shelf by building into the hillside, or (2) install piers of sufficient height to create a level surface for the shelter and tower. The granite outcrop layers observed at the tower location were spalling and lifting which may be unstable.

The construction contractor shall implement Mitigation Measure 1 – Geology, which requires that the foundations for the tower at Poopenaut Pass be located below the spalling surface layers for tower foundation stability. The site of the communication shelter is underlain by granitic cobbles and boulders of unexplored depth which could potentially settle vertically and laterally (EFGS 2006a). Therefore, the construction contractor shall implement Mitigation Measure 2 – Geology, which requires that the foundations be deeper on the west and northwest sides to reach firm rock for foundation stability. Please refer to Section 3.8.1.4 for Mitigation Measures.

The preparation of the foundation at this site would likely be performed with a combination of blasting, air-powered jackhammers, and air-powered drills. Specific equipment that would be used will be determined by the contractor that is awarded the project. Construction of the Poopenaut Pass Site and access trail would involve ground disturbance, and could result in potentially significant soil erosion impacts. This site is not located on an unstable geologic unit or soil, along an earthquake fault, in a liquefaction or landslide zone, and no impact to these geologic resources would occur. The site is generally located on hard granite and anticipated to underlie surficial deposits of soil and rock debris at the proposed shelter and tower location (EFGS 2006a). Implementation of Mitigation Measures 1 and 2 – Geology, implementation of Mitigation Measure 3 – Hydrology, which would implement Best Management Practices (BMPs) to minimize soil erosion, and implementation of BMPs from the Storm Water Pollution Prevention Plan (SWPPP), would reduce construction-related soil erosion impacts to less than significant levels.

Though the Poopenaut Pass Area is not an area where seismic activity has generally been highly common or severe, the area is nevertheless vulnerable to occasional seismic activity and to its potential harmful effects. Impacts would be less than significant with mitigation incorporated under CEQA. Impacts would be local, short-term, moderate, and adverse under NEPA.

Impact Determination (Poopenaut Pass Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, moderate, adverse impact.

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local	Short-Term	Negligible	Adverse	NI
Cherry Pump Station	CPS	Local	Short-Term	Negligible	Adverse	NI
Cherry Water Tanks	CWT	Local	Short-Term	Minor	Adverse	LSM
Cherry Lake Garage and Warehouse	CGW	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Camphouse	CCH	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #1	CC1	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #2	CC2	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #3	CC3	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #4	CC4	Local	Short-Term	Negligible	Adverse	NI
Cherry Tower Site	CTS	Local	Short-Term	Moderate	Adverse	LSM
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Minor	Adverse	LSM
Intake Switchyard	ISY	Local	Short-Term	Negligible	Adverse	NI
Kirkwood Powerhouse	KPH	Local	Short-Term	Negligible	Adverse	NI
Holm Powerhouse	HPH	Local	Short-Term	Negligible	Adverse	NI
Duckwall Mountain						
Duckwall Mountain	DWM	Local	Short-Term	Negligible	Adverse	NI
Jones Point						
Jones Point	JPT	Local	Short-Term	Negligible	Adverse	NI
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Moderate	Adverse	LSM

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

All project actions proposed for the existing communication sites in the Cherry Lake, Early Intake & Tuolumne River (except for Intake Radio Site) and Duckwall Mountain Areas would take place in existing developed areas. Equipment would be removed from the Duckwall Mountain and Jones Point sites. No groundwork or construction would occur at these two sites and therefore no impacts would occur. Minimal ground disturbance would occur at these sites for the trenching and installation and routing of the aerial fiber optic cable in new conduit to the Cherry Valve House and Cherry Lake Garage and Warehouse sites. Ground disturbance would be short-term and for the duration that the cable is installed.

At the Cherry Water Tanks site, trenching would occur along 175 linear feet from the existing power pole to the edge of the developed area of the Cherry Water Tanks to install the secondary electrical line. The area of disturbance would be approximately 1,750 sq. ft. for the clearing and trenching. Implementation of BMPs from the SWPPP, and Mitigation Measure 3 – Hydrology, which would implement BMPs to

minimize soil erosion, would reduce construction-related soil erosion impacts to less than significant levels. Though these sites are not in areas where seismic activity has generally been highly common or severe, these areas are nevertheless vulnerable to occasional seismic activity and to its potential harmful effects. Construction of facilities in the Cherry Lake, Early Intake and Tuolumne River areas in accordance with current seismic engineering requirements would result in a local, short-term, negligible, adverse impact related to geologic resources. The proposed upgrades would not change the topography or result in soil erosion or loss of top soil because they are already developed areas. These sites are not located on an unstable geologic unit or soil, along an earthquake fault, in a liquefaction or landslide zone. There would be no impacts to geologic resources as a result of the upgrades at these sites.

Intake Radio Site

Implementation of Proposed Actions at the Intake Radio Site would involve installation of a new communication tower, emergency generator and propane tank, and construction of a modular communication shelter. This site and surrounding area are generally blanketed by a thin soil cover composed of clayey sand and granitic rock fragments and cobbles with occasional small boulders (EFGS 2006b). Hard bedrock was exposed in parts of the dirt access road where the road has been recently bladed smooth (EFGS 2006b). The geologic hazards evaluation for the site did not identify any potential for uneven settling of the site. Ground disturbance at this site would involve approximately 1,045 sq. ft. The foundations for the tower and communication shelter at Intake Radio Site may be slab on grade, drilled piers, or foundation curbs as determined by equipment manufacturers. Implementation of these construction activities would involve ground disturbance totaling approximately 1,045 sq. ft., and could result in potentially significant soil erosion impacts. The site is generally located on hard granitic rock that was observed just below the thin surface soils (EFGS 2006b). The construction of the concrete foundations would require the use of various types of heavy equipment such as backhoes, augers, concrete trucks, and cranes. In addition, equipment used to prepare this site may include excavators, front-end loaders, graders, compactors, backhoes, and trenchers. Implementation of BMPs from the SWPPP, and Mitigation Measure 3 – Hydrology, would reduce construction-related soil erosion impacts to less than significant levels.

Although the Intake Radio Site is not located in an area where seismic activity has generally been highly common or severe, the area is nevertheless vulnerable to occasional seismic activity and to its potential harmful effects. Construction of facilities in accordance with current seismic engineering requirements, adherence to Soil Support Services Management Practice 13-A as identified in the Forest Plan as amended and implementation of BMPs pre- and post-construction would result in a less than significant, local, long-term, minor, adverse impact related to geologic resources. Soil Support Services Management Practice 13-A would require managing soil cover to avoid a high erosion hazard condition and implementation of BMPs to reduce erosion, compaction, and soil displacement.

Burnout Ridge

Implementation of the Proposed Action at the Burnout Ridge site would involve installation of a new communication tower, emergency generator, propane tank and pad mounted electrical transformer and modular communication shelter. The construction of the concrete foundations at Burnout Ridge would require the use of various types of heavy equipment such as backhoes, augers, concrete trucks, and cranes.

A geologic hazards evaluation for the site observed that the site is underlain by a relatively thin veneer of soil and granitic cobbles, and scattered trees (EFGS 2006c). There are bedrock outcrops along all sides of the ridge crest selected for the communication site. The tower and shelter foundations may be slab on grade, drilled piers, or foundation curbs, as determined by equipment manufacturers. Access to the Burnout Ridge site would be facilitated through clearing of existing trees and stumps, and engineering of a 1,500-foot remnant road that was formerly used by the USFS. The last 1,500 feet of the remnant road would be graveled or paved depending on the slope. Portions of this road that exceed an 18% slope would be graveled and the last 275 feet would be paved so that a propane truck to service the emergency generator can be accommodated. Implementation of these construction activities would involve extensive ground disturbance, and could result in potentially significant soil erosion impacts. Ground disturbance at this site would involve approximately 10,433 sq. ft. for the communication site, and approximately 30,220 sq. ft. for the access road. The remnant road would have geotextile reinforcement fabric laid under portions of the road base that are composed primarily of earth to support the final gravel surface. The road subgrade would be sloped at one to two percent towards the drainage swale so that the water is conveyed away from the road base to prevent washout of the gravel surface. Construction of the road subgrade slope, application of BMPs such as providing erosion and sediment control measures, and implementation of mitigation measures identified in the Hydrology section (Mitigation Measure 3 – Hydrology), would result in local, short-term, moderate, and adverse impacts. Impacts would be less than significant with mitigation incorporated.

Adherence to Soil Support Services Management Practice 13-A and implementation of BMPs pre- and post-construction would reduce geology impacts to less than significant levels. The project applicant shall also adhere to Road Construction and Reconstruction Management Practice 16-A. Management Practice 16-A requires that the location, design and construction standards will protect soil, watersheds, fisheries and other resources.

Though the Burnout Ridge site is not located in areas where seismic activity has generally been highly common or severe, the sites are nevertheless vulnerable to occasional seismic activity and to its potential harmful effects. The proposed upgrades at the Burnout Ridge site would alter the topography to accommodate the new structures, which could result in soil erosion. These sites are not located on an unstable geologic unit or soil, along an earthquake fault, or in a liquefaction or landslide zone. Adherence to the US Forest Service Management Practices, implementation of BMPs and Mitigation Measure 3-Hydrology, would reduce potentially significant impacts to geologic resources to less than significant levels.

Cherry Tower Site

The Cherry Tower Site is covered with granitic cobbles/boulders, and scattered trees. The construction of the concrete foundations at the Cherry Tower Site would require the use of various types of heavy equipment such as backhoes, augers, concrete trucks, and cranes. Ground disturbance at this site would involve approximately 3,483 sq. ft. for the communication site, and approximately 6,741 sq. ft. for the access road.

A geologic hazards evaluation for the site observed that the site may be underlain by artificial fill of undetermined thickness from activities related to dam and spillway construction (EFGS 2006d). However, due to the location of bedrock outcrops in the adjacent spillway, the thickness of any artificial fill underlying the site is anticipated to be minor (EFGS 2006d). The geologic hazards evaluation found that with the site underlain by soil and granitic cobbles and boulders of unexplored depth, likely representing artificial fill related to the construction of the dam. The artificial fill mixture could potentially settle unevenly. The construction contractor shall implement Mitigation Measure 3 – Geology, which requires that the communication shelter foundation be deepened to reach firm rock for foundation stability. Equipment used to prepare this site may include excavators, front-end loaders, graders, compactors, backhoes, and trenchers.

Proposed Actions at the Cherry Tower Site would involve installation of a communication tower, modular communication shelter, emergency generator, and propane tank. The tower and shelter foundations may be slab on grade, drilled piers, or foundation curbs, as determined by equipment manufacturers. Implementation of these construction activities would involve ground disturbance, and could result in soil erosion impacts. Application of BMPs such as providing erosion and sediment control measures, as well as complying with other Stanislaus National Forest Plan Direction soil protection guidelines listed above, would result in local, short-term, minor, adverse impacts.

Adherence to Soil Support Services Management Practice 13-A and implementation of BMPs pre- and post- construction would reduce geology impacts to less than significant levels. The project applicant shall also adhere to Road Construction and Reconstruction Management Practice 16-A. Management Practice 16-A requires that the location, design and construction standards will protect soil, watersheds, fisheries and other resources.

Though the Cherry Tower Site is not located in areas where seismic activity has generally been highly common or severe, the sites are nevertheless vulnerable to occasional seismic activity and to its potential harmful effects. The proposed upgrades at Cherry Tower Site would alter the topography to accommodate the new structures, which could result in soil erosion. These sites are not located on an unstable geologic unit or soil, along an earthquake fault, in a liquefaction or landslide zone. Construction of facilities in accordance with current seismic engineering requirements would result in a local, short-term, minor, adverse impact related to seismic hazards. Adherence to the US Forest Service Management Practices, implementation of BMPs and Mitigation Measure 3- Geology, and Mitigation Measure 3 – Hydrology, would reduce potentially significant impacts to geologic resources to less than significant levels.

Impact Determination (Existing Sites in Cherry Lake not including Cherry Water Tanks, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas)**:**

CEQA: No impact.

NEPA: Local, short-term, negligible, adverse impact.

Impact Determination (Cherry Water Tanks)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, minor, adverse impact.

Impact Determination (Intake Radio Site)

CEQA: Less than significant with mitigation incorporated

NEPA: Local, short-term, minor, adverse impact

Impact Determination (Burnout Ridge)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, moderate, adverse impact.

Impact Determination (Cherry Tower Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, minor, adverse impact.

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Alternative 3 is the same as Alternative 2, the Preferred Alternative, except that the Poopenaut Pass (PPP) site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the PPP site identified for Alternative 2. Potential short-term and long-term geologic impacts would be the same as those described for the Alternative 2. The same facilities would be constructed and installed, but at a different location for the PPP site. Implementation of BMPs, project-specific Mitigation Measures 1, 2, and 3 – Geology and Mitigation Measure 3 - Hydrology, and adherence to US Forest Service Management Practices (for USFS sites) would reduce short- and long-term effects to geologic resources.

3.8.1.4 Mitigation Measures

Mitigation Measure 1 – Geology – The SFPUC will review and approve the design for the foundations for the tower at Poopenaut Pass prior to the start of construction to ensure that the foundations will be located below the spalling surface layers for tower foundation stability.

Mitigation Measure 2 – Geology - The SFPUC will review and approve the design for the communication shelter foundation for the Poopenaut Pass site prior to the start of construction to ensure that the foundations will be deeper on the west and northwest sides to reach firm rock for foundation stability.

Mitigation Measure 3 – Geology – The SFPUC will review and approve the design for the communication shelter foundation for the Cherry Tower Site prior to the start of construction to ensure that the foundation will be deepened to reach firm rock for foundation stability.

3.8.1.5 Impairment

Impacts to geology and soils associated with Alternative 1 are expected to be local, short-term, negligible, and adverse. Impacts associated with the existing sites for Alternatives 2 and 3 are expected to be local,

short-term, negligible, and adverse while the new sites are expected to be local, short-term, minor to moderate, and adverse. With the implementation of Best Management Practices, project-specific Mitigation Measures, and adherence to management practices, geologic resources of the park would not be impaired for future generations.

3.8.1.6 Cumulative Impacts

Cumulative effects on geologic resources are based on analysis of projects in the Hetch Hetchy Communication System Upgrade project area. There are no identifiable projects that would contribute to adverse onsite or offsite erosion or seismic activity. Other projects within the project area would be subject to erosion control practices, implement BMPs, project-specific Mitigation Measures, and adhere to management practices. Therefore, cumulative impacts would not be significant or adverse.

3.8.1.7 Conclusion Statement

Impacts on Geologic Resources are summarized below:

Warnerville Switchyard, all Moccasin Sites, O'Shaughnessy Sites, Lake Eleanor Sites, Cherry Lake Sites (not including Cherry Tower Site), Early Intake & Tuolumne River Area, Duckwall Mountain, and Jones Point:

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse.

Intake Radio Site, Cherry Tower Site, Burnout Ridge, and Poopenaut Pass:

CEQA: Less than significant/less than significant with mitigation incorporated.

NEPA: Local, short-term, minor to moderate, adverse impact.

3.8.2 Hydrology, Floodplains, and Water Quality Affected Environment

The following section describes the hydrology, floodplains, and water quality of the Hetch Hetchy Communication System Upgrade project site areas.

3.8.2.1 Affected Environment

Oakdale Area Site (Warnerville Switchyard)

The Warnerville Switchyard site is largely surrounded by agricultural lands. There are no major surface water features such as lakes or rivers in the immediate vicinity of the Warnerville Switchyard Site. The nearest water feature is the Oakdale South Main Canal, which is operated by the Oakdale Irrigation District (OID 2002). The Hetch Hetchy Aqueduct passes just north of the site.

Moccasin Area Sites

The Moccasin Peak and Moccasin Powerhouse Passive Reflector Sites are not located in the immediate vicinity of any major surface water features. The Moccasin Powerhouse is adjacent to the Moccasin Reservoir, which is part of the Hetch Hetchy water system.

Sierra Nevada Sites (Stanislaus National Forest and Yosemite National Park area)

Yosemite National Park in the areas of the proposed project sites has major surface water features, including Lake Eleanor, Hetch Hetchy Reservoir, and Tuolumne River. The Hetch Hetchy Reservoir falls within the Tuolumne River Watershed. Lake Eleanor is located within the Eleanor Creek Watershed. The proposed project sites in the Lake Eleanor, O'Shaughnessy, and Poopenaut Pass areas fall within the Tuolumne River Watershed. Annual precipitation ranges from 36 to 50 inches per year in Yosemite National Park (NPS 2004a). The Tuolumne River is one of the tributaries to the San Joaquin River Basin and drains the entire northern portion of the park, an area of approximately 680 square miles.

Hetch Hetchy and Lake Eleanor are reservoirs with a storage capacity of 360,360 acre-feet and 27,100 acre-feet respectively, and are part of the water and power production system operated by the City and County of San Francisco (NPS 2004a). The Hetch Hetchy system is a primary water source for a population of 2.5 million residents (NPS 2004a). The Sierra Nevada snowmelt flows down the Tuolumne River and into the Hetch Hetchy Reservoir, which provides the majority of the drinking water provided by the SFPUC (SFPUC 2006c).

Water quality throughout Yosemite National Park is considered to be good and generally above state and federal standards (NPS 2004a). There is some water quality degradation in areas of high visitor use, mainly along the Merced River (NPS 2000). The surface water quality of most park waters is considered by the State of California to be beneficial for wildlife habitat, freshwater habitat, and for canoeing, rafting, and other recreation, as indicated in the 1998 Central Valley Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan (NPS 2004a).

Major surface water features in the Stanislaus National Forest include Cherry Lake and the Tuolumne River. Cherry Lake is located within the Cherry Creek Watershed. Lake Eleanor, Cherry Lake, Hetch Hetchy Reservoir and the Tuolumne River in the vicinity of the project sites are not listed as impaired on the Environmental Protection Agency 303(d) list of water quality limited segments.

3.8.2.2 Thresholds of Significance

CEQA Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to hydrology and water quality, but considers that implementation of the proposed project would have a significant impact if it were to:

- Violate any water quality standards or waste discharge requirements;

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion of siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows; or
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam water related hazards such as flooding as a result of the failure of a levee or dam; or
- Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

NEPA Thresholds (National Park Service/US Forest Service Sites)

Impacts on hydrology, floodplain values, and water quality are discussed under this resource topic. Hydrology refers to hydrologic processes such as flooding, erosion and deposition, and channel movement. Floodplain values are attributes of flooding that contribute to ecosystem quality, such as recharge of riparian ground water. Particular attention was given to alterations or restoration of the floodplain (e.g., placement or restoration of facilities in a floodplain). Water quality refers to the suitability of surface water for recreational use and wildlife habitat, particularly the enhancement or degradation of water quality. The National Park Service *Freshwater Resource Management Guidelines* (found in NPS-77) requires the National Park Service to "maintain, rehabilitate, and perpetuate the inherent integrity of water resources and aquatic ecosystems." The Clean Water Act requires the National Park Service to "comply with all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution.

The Stanislaus Forest Plan as amended, Forestwide Standards and Guidelines for Water Quality has Water Quality Management Practice 18-A which gives general direction to comply with all applicable Federal and State water quality standards, and to prevent or minimize as much as possible any water quality impacts which may be caused by Forest management activities. The Standards and Guidelines for Management Practice 18-A requires the implementation of Best Management Practices to minimize or prevent water pollution generated by non-point sources, which is applicable to all Forest management activities.

Context of Impact

Localized impacts would occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action (e.g., radiating impacts of concentrated visitor use). Regional impacts would occur over a large area, such as Yosemite National Park or Stanislaus National Forest.

Duration of Impact

Short-term impacts occur during the alternative's implementation are usually considered to be less than two years in duration (e.g. construction projects). A period of one year is a common threshold used to distinguish a short-term impact from a longer-term or permanent impact. Long-term impacts remain after the alternative has been implemented and are usually longer than two years in duration.

Intensity of Impact

Negligible impacts would be imperceptible or not detectable. Minor impacts would be slightly perceptible and localized, without the potential to expand if left alone. Moderate impacts would be apparent and have the potential to become larger. Major impacts would be substantial, highly noticeable, and may be permanent, or could increase if left alone.

Type of Impact

Adverse impacts alter natural hydrologic conditions (e.g., impede flood flows, cause unnatural erosion or deposition, etc.) or degrade water quality (e.g., increase pollution or bacteria levels from recreational use). Beneficial impacts are those that restore natural hydrologic conditions (e.g., remove impediments to flood flows, stabilize riverbanks, etc.) or improve water quality (e.g., reduce non-point source pollution).

Assumptions

The analysis of impacts to hydrology and water quality is based on the assumption that the Proposed Action would include standard procedures related to grading and erosion control and stormwater runoff.

Grading and Erosion Control

The Proposed Actions at the sites could expose more than one (1) acre of disturbed construction area to stormwater runoff - particularly for the new project sites: Cherry Tower Site, Burnout Ridge, and Poopenaut Pass. Prior to construction, the applicant would file a Notice of Intent to discharge stormwater to the Regional Water Quality Control Board and prepare and implement provisions of a Storm Water Pollution Prevention Plan to control runoff from construction activities, which would be short-term in nature. The Best Management Practices specified in the SWPPP would specify means of waste disposal, post-construction sediment and erosion control, and maintenance responsibilities. The construction contractor(s) would also be required to implement appropriate hazardous materials management practices to reduce the possibility of chemical spills or releases of contaminants, including any non-stormwater discharge to drainage channels. Post-construction permanent BMPs would also be implemented where deemed necessary, to minimize long-term effects from land disturbances and contaminated runoff.

3.8.2.3 Environmental Consequences

Environmental Consequences of Alternative 1 (No Action)

The Hetch Hetchy Communication system would continue to operate as it currently does under Alternative 1. The Cherry Tower, Poopenaut Pass, and Burnout Ridge sites would not be developed and the system would continue to operate on the 2 GHz band. Therefore there would be no changes to impermeable surfaces such that the drainage and natural hydrologic flow in the vicinity of the project sites would occur. There would continue to be a need for updated and improved communication systems for HHW&P, National Park Service, and the US Forest Service. No changes to existing hydrology, floodplains, or water quality would occur. Alternative 1 would result in local, short-term, negligible, and adverse impacts to hydrologic processes.

Environmental Consequences of Alternative 2 (Preferred Alternative)

None of the project alternatives would require the construction of structures that would house people. Therefore people would not be exposed to significant loss, injury or death involving inundation by seiche, tsunami, or mudflow. Thus, this issue is not discussed further in this analysis.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	Local	Short-Term	Negligible	Adverse	LS

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse	MPH	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse Passive Reflector	MPR	Local	Short-Term	Negligible	Adverse	NI

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Oakdale and Moccasin Area Sites

No site preparation such as grading would be required at any of these sites. Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse would require the short-term removal of the existing asphalt paving to allow for the construction of the new tower foundation. These sites are not located near any rivers or surface waters and would therefore have no impact on river hydrology or present a potential flood hazard.

The maximum size of the square concrete cap foundation at Warnerville Switchyard for the tower would be approximately 23 feet by 23 feet. The maximum size of the square concrete cap foundation for the tower at Moccasin Peak would be approximately 17 feet by 17 feet. The maximum size of the concrete cap foundation for the tower would be a single circular pier with an estimated maximum dimension of six feet in diameter. The Moccasin Powerhouse Passive Reflector site only involves the removal of the

passive reflector. Therefore no new foundation construction would be required. The construction of the new concrete cap foundations at these sites would not constitute net new impermeable surfaces, as these sites are already covered by impermeable surfaces.

The proposed upgrades would occur within developed areas and would not result in increased impermeable surfaces, changes to the surface such that groundwater supplies would be depleted, result in runoff water that would exceed the capacity of existing stormwater drainage systems, place structures within a 100-year flood hazard area that would impede or redirect flood flows, or expose people or structures to water related hazards. Implementation of BMPs during the removal of existing asphalt paving and construction of new foundation would prevent any release and transportation of sedimentation off-site, and would not violate any water quality standards or waste discharge requirements.

Impacts to hydrology, floodplains, and water quality would be less than significant under CEQA and local, short-term, negligible and adverse under NEPA.

Impact Determination (Oakdale and Moccasin Areas)**:**

CEQA: Less than significant.

NEPA: Local, short-term, negligible and adverse.

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Dam Diversion Tunnel	ODT	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Stream Gauge	OSG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Quality Building	OWQ	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Chalet (Cottage 1)	OC1	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Bunkhouse	OBH	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Tanks	OWT	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor-Cherry Lake Tunnel	ECT	Local	Short-Term	Negligible	Adverse	LS
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Short-Term	Minor	Adverse	LSM
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

No site preparation such as grading or trenching would be required at any of these sites. Although located near water bodies, the proposed upgrades at the O'Shaughnessy and Lake Eleanor sites (with exception of Lake-Eleanor-Cherry Lake Tunnel site) would not involve ground disturbance, construction of additional

structures, or addition of impervious surfaces that would contribute to increased water runoff. The upgrades proposed at the O'Shaughnessy sites would occur inside existing buildings or in a wall-mounted cabinet on the exterior of the buildings. The installation of the pad-mounted communication cabinet of similar size to the communication cabinet already at the Lake Eleanor-Cherry Lake Tunnel would be a very small increase in impermeable surfaces in the area and would not alter the drainage courses and runoff patterns of the area. Minimal ground disturbance of approximately 24 sq. ft. would occur at the Lake Eleanor-Cherry Lake Tunnel site for the installation of the concrete equipment pad. Ground disturbance would be short-term, only for the duration that the equipment pad is installed.

The proposed upgrades at the O'Shaughnessy and Lake Eleanor sites would not result in changes to the surface such that groundwater supplies would be depleted, result in runoff water that would exceed the capacity of existing stormwater drainage systems, place structures within a 100-year flood hazard area that would impede or redirect flood flows, or expose people or structures to water related hazards.

The Lake Eleanor Dam Level Gauge area is already developed consisting of concrete surfaces. The installation of a pad-mounted communication cabinet at this site would not result in a net new increase in impermeable surfaces. These sites are not located near any rivers and would therefore have no impact on river hydrology or present a potential flood hazard as it would not impede or redirect flood flows. Although the O'Shaughnessy Stream Gauge is located adjacent to the Tuolumne River, the proposed upgrade to install an antenna to the existing stream gauge structure would not change the river hydrology or present a flood hazard. Impacts to hydrology, floodplains, and water quality would be less than significant and local, short-term, negligible and adverse. The proposed upgrades would occur within developed areas and would not result in increased impermeable surfaces, would not violate any water quality standards or waste discharge requirements, result in changes to the surface such that groundwater supplies would be depleted, result in runoff water that would exceed the capacity of existing stormwater drainage systems, place structures within a 100-year flood hazard area that would impede or redirect flood flows, or expose people or structures to water related hazards.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas)**:**

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Poopenaut Pass

Construction of the Poopenaut Pass site would include the development of an access trail, new communication structure, and new communication tower. Due to the topography and rocky nature of this site, site preparation would not involve grading or excavation using large construction equipment. However, the site would have short-term disturbance from the construction of the access trail, new communication tower, communication structure, and installation of electrical wire within the access trail. The disturbed areas from construction activities would be subject to erosion and discharge of sediment via stormwater runoff to off-site locations. In addition, construction materials such as fuels, paints, hydraulic fuel, and anti-freeze could accidentally spill from construction equipment or be transported off-site during storm events via runoff. The project contractor(s) shall implement Mitigation Measure 1 - Hydrology,

requiring implementation of an Oil and Hazardous Spill Prevention, Control, and Countermeasure Plan to address hazardous materials storage, spill prevention and response in the event of unexpected spills at the project sites during construction and operation; and Best Management Practices from the Storm Water Pollution Prevention Plan which would contain erosion control measures and would minimize construction-related non-point source water quality effects, and would not violate any water quality standards or waste discharge requirements. There are no surface water bodies in the vicinity of the Poopenaut Pass site, therefore there would be no impacts on river hydrology or potential flood hazard, nor would any persons or structures be exposed to water related hazards.

The trail would not be paved or have impermeable surfaces; however the new structures would create new impervious surfaces and construction of the new trail would alter drainage courses and runoff patterns at the site, especially in storm events. Poopenaut Pass Site's maximum size of the round circular piers (one for each leg of the tower) would be two feet in diameter. A 12-foot by 24-foot communication shelter is also proposed at Poopenaut Pass. Net new impervious surfaces at the Poopenaut Pass site would be approximately 307 sq. ft., which could potentially alter surface drainage of the site. In addition, the site within the fenced area would be graveled with a retaining wall uphill and downhill of the building to maintain the gravel path around the building. Although the gravel would be compacted, it could be potentially transported off-site during storm events. Mitigation Measure 2 - Hydrology, implementation of drainage plans that maintain a rate of stormwater runoff that does not exceed pre-project conditions, shall be implemented to minimize long-term water quality effects.

Long-term operations-related water quality could change as a result of the new site. The Poopenaut Pass site would be accessed by a foot trail. The communication shelter would be equipped with a manual transfer switch and means of connecting to a portable emergency generator. The emergency generator may be powered by propane, which could be a source of potential contaminants, and in the event of a spill, contaminants could be transported into local drainage courses. The implementation of Mitigation Measure 1 – Hydrology, would reduce potential impacts associated with unexpected on-site spills, and would also reduce potential operational water quality effects. Impacts to hydrology, floodplains, and water quality would be less than significant with mitigation incorporated under CEQA; and local, short-term, minor and adverse under NEPA, because they would be slightly perceptible and localized.

Impact Determination (Poopenaut Pass Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, minor and adverse.

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local	Short-Term	Negligible	Adverse	NI
Cherry Pump Station	CPS	Local	Short-Term	Negligible	Adverse	NI
Cherry Water Tanks	CWT	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Garage and Warehouse	CGW	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Camphouse	CCH	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #1	CC1	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #2	CC2	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #3	CC3	Local	Short-Term	Negligible	Adverse	NI
Cherry Lake Cottage #4	CC4	Local	Short-Term	Negligible	Adverse	NI
Cherry Tower Site	CTS	Local	Short-Term	Minor	Adverse	LSM
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Minor	Adverse	LSM
Intake Switchyard	ISY	Local	Short-Term	Negligible	Adverse	NI
Kirkwood Powerhouse	KPH	Local	Short-Term	Negligible	Adverse	NI
Holm Powerhouse	HPH	Local	Short-Term	Negligible	Adverse	NI
Duckwall Mountain						
Duckwall Mountain	DWM	Local	Short-Term	Negligible	Adverse	NI
Jones Point						
Jones Point	JPT	Local	Short-Term	Negligible	Adverse	NI
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Minor	Adverse	LSM
CEQA and NEPA Impacts: N/A = Not applicableNI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

No site preparation such as grading would be required at these sites with the exception of Intake Radio Site, which would require the removal of existing asphalt paving to allow for the construction of the new tower foundation. The proposed upgrades at Jones Point, Intake Switchyard Holm Powerhouse, Kirkwood Powerhouse, and Cherry Lake area sites would occur inside existing buildings or in a wall-mounted cabinet on the exterior of the buildings, and would not involve the construction of additional structures or addition of impervious surfaces that would contribute to increased water runoff, and would not violate any water quality standards or waste discharge requirements. The Duckwall Mountain and Jones Point sites would only involve the removal of the passive reflector. Therefore no new foundation construction would be required at these sites.

The proposed upgrades at these sites would occur within existing structures and would not result in increased impermeable surfaces, changes to the surface such that groundwater supplies would be depleted, result in runoff water that would exceed the capacity of existing stormwater drainage systems, place structures within a 100-year flood hazard area that would impede or redirect flood flows, or expose people or structures to water related hazards.

Impacts to hydrology, floodplains, and water quality at existing sites in the Cherry Lake, Early Intake and Tuolumne River, and Duckwall Mountain areas (not including Cherry Tower Site and Intake Radio Site) would be local, short-term, negligible and adverse.

Intake Radio Site

Intake Radio Site would require the removal of existing asphalt paving to allow for the construction of the new tower foundation. Intake Radio Site's maximum size of the square concrete cap foundation for the tower would be approximately 15 feet by 15 feet. A 12-foot by 24-foot communication shelter is also proposed at Intake Radio Site. Net new impervious surfaces at Intake Radio Site would be approximately 500 sq. ft., which could potentially alter surface drainage of the site. Adherence to Water Quality Management Practice (18-A) and implementation of Best Management Practices pre- and post-construction would reduce water quality and runoff impacts to less than significant levels. The site within the fenced area would be graveled, which could be potentially transported off-site during storm events. Currently the conceptual design of the site includes fencing, but no design features that would retain the gravel on the site. Mitigation Measure 2 - Hydrology shall be implemented to minimize long-term water quality effects. The propane tank at Intake Radio Site could be a source of potential contaminants, and in the event of a spill, contaminants could be transported into local drainage courses. Implementation of Mitigation Measure 1 – Hydrology would reduce potential impacts associated with on-site propane storage, spill prevention, and response in the event of unexpected spills, and would also reduce potential operational water quality effects. Mitigation Measure 2 - Hydrology shall be implemented to minimize long-term water quality effects through the development of drainage plans. The propane tank at Intake Radio Site could be a potential contaminant in the event of a spill, which can be transported into local drainage courses. Implementation of Mitigation Measure 1 – Hydrology, would reduce long-term operations-related water quality effects and would not violate any water quality standards or waste discharge requirements and would address the propane storage, spill prevention, and response in the event of unexpected spills.

Impacts to hydrology, floodplains, and water quality for Intake Radio Site would be less than significant with mitigation incorporated, local, short-term, minor and adverse.

Burnout Ridge

The construction of Burnout Ridge would involve short-term ground disturbance as a result of the site preparation and long-term disturbance due to new impermeable surfaces. Burnout Ridge's maximum size of the square concrete cap foundation for the tower would be approximately 23 feet by 23 feet. A 12-foot by 40-foot communication shelter is also proposed at Burnout Ridge. Approximately 1,500 feet of the remnant road leading to the Burnout Ridge site would require improvements to accommodate long-term access, as mentioned in Section 1.0 of this document. Net new impervious surfaces at the Burnout Ridge Site would be approximately 1,000 sq. ft. (not including engineered road). The road would include a drainage swale on one side, which would collect and direct runoff to Cherry Lake Road. The propane tank at Burnout Ridge could be a source of potential contaminants, and in the event of a spill, contaminants could be transported into local drainage courses. Implementation of Mitigation Measure 1 – Hydrology, would reduce potential impacts associated with on-site propane storage, spill prevention, and response in the event of unexpected spills, and would also reduce potential operational water quality

effects. Implementation of Mitigation Measure 1 – Hydrology, to reduce long-term operations-related water quality effects, would not violate any water quality standards or waste discharge requirements, and would address the propane storage, spill prevention, and response in the event of unexpected spills. Mitigation Measure 2 - Hydrology, implementation of drainage plans that maintain a rate of stormwater runoff that does not exceed pre-project conditions, shall be implemented to minimize long-term water quality effects.

The disturbed areas from construction activities would be subject to erosion and discharge of sediment via stormwater runoff to off-site locations. In addition, construction materials such as fuels, paints, hydraulic fuel, and anti-freeze could accidentally spill from construction equipment or be transported off-site during storm events via runoff. The project contractor(s) shall implement Mitigation Measure 3 – Hydrology, implementation of Best Management Practices to minimize soil erosion, and Best Management Practices from the Storm Water Pollution Prevention Plan, which would minimize construction-related non-point source water quality effects.

Adherence to Water Quality Management Practice 18-A and implementation of Best Management Practices pre- and post- construction would reduce water quality and runoff impacts to less than significant levels. The project applicant shall also adhere to Road Construction and Reconstruction Management Practice 16-A. Management Practice 16-A would require that the location, design and construction standards will protect soil, watersheds, fisheries and other resources. Additionally, road construction standards to protect watershed resources would include avoiding wetlands or minimizing effects to natural flow patterns in wetlands, and avoiding road construction in meadows. The site within the fenced area would be graveled. Although the gravel would be compacted, it could be potentially transported off-site during storm events. Currently the conceptual design of the sites includes fencing, but no design features that would retain the gravel within the sites. Mitigation Measure 1 – Hydrology, shall be implemented to minimize long-term water quality effects. Adherence to the Forest Service Management Practices and implementation of Best Management Practices would reduce runoff and potential impacts to hydrology, floodplains, and water quality to less than significant levels.

Impacts to hydrology, floodplains, and water quality for Burnout Ridge would be less than significant with mitigation incorporated, local, short-term, minor and adverse.

Cherry Tower Site

The construction of Cherry Tower Site would involve short-term ground disturbance as a result of the site preparation and long-term disturbance due to new impermeable surfaces. Cherry Tower Site's maximum size of the square concrete cap foundation for the tower would be approximately 15 feet by 15 feet. A 12-foot by 24-foot communication shelter is also proposed at Cherry Tower Site. Net new impervious surfaces at Cherry Tower Site would be approximately 500 sq. ft., which could potentially alter surface drainage of the site. Water quality could change as a result of the long-term operation of this new site. The communication shelter would be equipped with a manual transfer switch and means of connecting to a portable emergency generator. The emergency generator may be powered by propane, which could be a source of potential contaminants, and in the event of a spill, contaminants could be transported into local drainage courses. The implementation of Mitigation Measure 1 – Hydrology, would reduce potential

impacts associated with on-site spill prevention. Response in the event of unexpected spills would also reduce potential operational water quality effects. Mitigation Measure 2 - Hydrology, implementation of drainage plans that maintain a rate of stormwater runoff that does not exceed pre-project conditions, shall be implemented to minimize long-term water quality effects. Impacts to hydrology, floodplains, and water quality would be less than significant with mitigation incorporated under CEQA; and local, short-term, minor and adverse under NEPA, because they would be slightly perceptible and localized.

The disturbed areas from construction activities would be subject to erosion and discharge of sediment via stormwater runoff to off-site locations. Construction materials such as fuels, paints, hydraulic fuel, and anti-freeze could also accidentally spilled from construction equipment or be transported off-site during storm events via runoff. The project contractor(s) shall implement Mitigation Measure 3- Hydrology and BMPs from the Storm Water Pollution Prevention Plan, which would minimize construction-related non-point source water quality effects.

Adherence to Water Quality Management Practice 18-A and implementation of Best Management Practices pre- and post- construction would reduce water quality and runoff impacts to less than significant levels. The project applicant shall also adhere to Road Construction and Reconstruction Management Practice 16-A. Management Practice 16-A would require that the location, design and construction standards will protect soil, watersheds, fisheries and other resources. Additionally, road construction standards to protect watershed resources would include avoiding wetlands or minimizing effects to natural flow patterns in wetlands, and avoiding road construction in meadows. The site within the fenced area would be graveled. Although the gravel would be compacted, it could be potentially transported off-site during storm events. Currently the conceptual design of the sites includes fencing, but no design features that would retain the gravel within the sites. Mitigation Measure 1 – Hydrology, shall be implemented to minimize long-term water quality effects and would not violate any water quality standards or waste discharge requirements. Adherence to the Forest Service Management Practices and implementation of Best Management Practices would reduce runoff and potential impacts to hydrology, floodplains, and water quality to less than significant levels.

Impacts to hydrology, floodplains, and water quality for Cherry Tower Site would be less than significant with mitigation incorporated, local, short-term, minor and adverse.

Impact Determination (Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas)**:**

CEQA: No impact.

NEPA: Local, short-term, negligible, adverse impact.

Impact Determination (Intake Radio Site)

CEQA: Less than significant with mitigation incorporated

NEPA: Local, short-term, minor, adverse impact

Impact Determination (Burnout Ridge)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, minor, adverse impact.

Impact Determination (Cherry Tower Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, minor, adverse impact.

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Alternative 3 is similar to the Proposed Action, except the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road. Potential short-term construction related water quality impacts would be the same as those described for the Preferred Alternative. The impacts would be essentially identical to those described for the Preferred Alternative, since the Poopenaut Pass Site would still be constructed, but located north of the Preferred Alternative. Implementation of Best Management Practices, Mitigation Measures 1, 2 and 3 -Hydrology, and adherence to US Forest Service Management Practices (for USFS sites) would reduce short- and long-term effects to water quality.

3.8.2.4 Mitigation Measures

Mitigation Measure 1 – Hydrology – The SFPUC will review and approve the Oil and Hazardous Spill Prevention, Control, and Countermeasure Plan prepared by the construction contractor prior to the start of construction. The SFPUC will ensure that the plan addresses hazardous materials storage, spill prevention and response in the event of unexpected spills at the project sites during construction and operation. Spill response materials such as absorption materials shall be kept at each of the new sites.

Mitigation Measure 2 – Hydrology – The SFPUC will review and approve the drainage plans prepared for the Poopenaut Pass, Burnout Ridge, Cherry Tower Site and Intake Radio Sites prior to the start of construction. The SFPUC will ensure that the design plans provide for the minimization of stormwater runoff so that the rate of stormwater runoff does not exceed above pre-project conditions. Specifications shall include design features that address how the gravel would be retained within each of the sites.

Mitigation Measure 3 – Hydrology – The SFPUC shall ensure that the construction contractor implement the following Best Management Practices prior to the start of construction at Intake Radio Site, Cherry Tower Site, Poopenaut Pass, and Burnout Ridge: place straw rolls around stormwater inlets; install silt fences to prevent any construction water runoff from going off-site; use geotextile or plastic covers on stockpiled soil; and stabilize site ingress/egress locations to minimize erosion.

3.8.2.5 Impairment

Impacts to hydrology, floodplains, and water quality associated with Alternative 1 are expected to be local, short-term, negligible, and adverse. Impacts associated with the existing sites for Alternatives 2 and 3 are expected to be local, short-term, negligible, and adverse while the new sites are expected to be local, short-term, minor, and adverse. With the implementation of BMPs, Mitigation Measures 1 through

3 – Hydrology, and adherence to National Park Service *Freshwater Resource Management Guidelines* for park sites, hydrologic resources of the park would not be impaired for future generations.

3.8.2.6 Cumulative Impacts

Cumulative impacts to hydrologic processes are based on analysis of past, present, and reasonably foreseeable future actions proposed by SFPUC, and those within Stanislaus National Forest and Yosemite National Park in combination with potential effects of the Proposed Action. There are no cumulative projects known that would contribute to adverse onsite or offsite stormwater drainage, construction water quality effects, or long-term operations water quality effects. There are no projects that would constrain or have an adverse impact on the hydrology and flow or the Tuolumne River. The Tuolumne Wild and Scenic River Comprehensive Management Plan that is currently being developed by National Park Service and the Management Plan under the US Forest Service would protect river-related natural resources through the application of management elements. The SFPUC's WSIP would involve the improvement of Hetch Hetchy facilities; however, these improvements are primarily related to the water supply and are not located in the vicinity of the proposed project. The cumulative projects considered with Alternative 1 would have local, short-term, negligible, adverse effect on hydrology in Yosemite National Park and Stanislaus National Forest. Alternatives 2 and 3 would improve the access road drainage in the Burnout Ridge site area. The cumulative projects considered with Alternatives 2 and 3 would have local, short-term, minor, adverse effect on hydrology in Yosemite National Park and Stanislaus National Forest.

3.8.2.7 Conclusion Statement

Impacts on hydrology, floodplains, and water quality are summarized below:

Warnerville Switchyard, all Moccasin Sites, O'Shaughnessy Sites, Lake Eleanor Sites,

CEQA: Less than significant.

NEPA: Local, short-term, negligible and adverse.

Cherry Lake Sites (not including Cherry Tower Site), Early Intake & Tuolumne River Area (not including Intake Radio Site), Duckwall Mountain, and Jones Point:

CEQA: No impact.

NEPA: Local, short-term, negligible, adverse impact.

Poopenaut Pass, Intake Radio Site, Burnout Ridge, Cherry Tower Site:

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, minor and adverse.

3.8.3 Vegetation

3.8.3.1 Affected Environment

This section describes the existing vegetation at the Hetch Hetchy Communication System Upgrade project sites. Project sites that support native vegetation and where ground-disturbing activities will take place are described in more detail.

Oakdale Area Site (Warnerville Switchyard)

The Warnerville Switchyard site is located in Stanislaus County near the base of the Sierra Nevada foothills, about 2.5 miles southeast of the City of Oakdale. This is the westernmost of the project sites, located at an elevation of about 200 feet above sea level. The site is surrounded by actively managed agricultural fields. The existing facility where project activities will take place is devoid of native vegetation.

Moccasin Area Sites

The Moccasin Area sites are located within the Sierra Nevada foothills, near the intersection of Highways 49 and 120. The three sites in this area are located at elevations ranging from 1,000 feet to 3,000 feet and are surrounded by common vegetation types of the Sierra Nevada foothills such as chamise chaparral, foothill pine-oak woodland, and non-native annual grassland. Project activities at these sites will occur within existing facilities, which have already been cleared of native vegetation.

Sierra Nevada Sites (Stanislaus National Forest and Yosemite National Park area)

Early Intake and Tuolumne River Area

The five project sites in this area are located between 2,300 feet and 3,600 feet elevation near the confluence of the Cherry Creek and the Tuolumne River. Vegetation types in the area include foothill pine-oak woodland and chamise and manzanita chaparral on the steep south-facing slopes. Black oak woodland and mixed montane hardwood-conifer forests grow on the north facing slopes. Upgrades at the Intake Switchyard, Kirkwood Powerhouse, Holm Powerhouse, and Jones Point project sites will take place within existing facilities where vegetation has already be cleared. The Intake Radio Site, where an area adjacent to an existing facility will be cleared for a new tower, is located at an elevation of 4,079 feet and surrounded by black oak and gray pine woodland. The area to be prepared for the tower pad is a previously cleared area within pine-oak woodland that is characterized by sparse, non-native grassland vegetation.

O'Shaughnessy Dam sites

The O'Shaughnessy Dam sites are located at the O'Shaughnessy Dam and on the Tuolumne River below the dam at 3,500 feet to 3,700 feet elevation. The vegetation around these sites is dominated by Ponderosa pine, black oak and incense cedar. All project-related upgrades at these sites would occur within existing developed areas or on existing structures.

Cherry Lake and Lake Eleanor sites

These sites around Cherry Lake and Lake Eleanor are surrounded by ponderosa pine forest with scattered black oak, sugar pine, incense cedar and white fir. With the exception of the Cherry Tower site all project-related upgrades at these sites would occur within existing developed areas or on existing structures. The Cherry Tower site is located in an opening in the Ponderosa Pine forest and is mostly devoid of vegetation.

Poopenaut Pass

Poopenaut Pass is a proposed new site located in Yosemite National Park between the Hetch Hetchy Entrance Station and O'Shaughnessy Dam. The area is located in the yellow pine belt of the western Sierra Nevada. Because of the rocky substrate composed of an exfoliating granitic dome, and a history of frequent fires, the vegetation at this site is sparse and dominated by shrubs such as greenleaf manzanita (*Arctostaplylos patula)* and deerbrush (*Ceanothus integerrimus*). Other shrubs or subshrubs occurring on the site include bush chinquapin (*Chrysolepis sempervirens*), wooly sunflower (*Eriophyllum lanatum*), and yerba santa (*Eriodictyon californicum*). Occasional individual ponderosa pines (*Pinus ponderosa*), Jeffrey pines (*Pinus jeffreyi*), incense cedars (*Calocedrus decurrens*), and Douglas firs (*Pseudotsuga mensiezii*) occur scattered throughout the site. A few black oaks (*Quercus kelloggii*) occur in more sheltered locations near the road. On deeper soils in cracks of the granite, the herbaceous layer includes purple milkweed (*Asclepias cordifolia*), blue Penstemon (*Penstemon laetus*), two-lobe fairyfan (*Clarkia biloba* ssp. *biloba*), harlequin lupine (*Lupinus stiversii*), and Indian paintbrush (*Castilleja* sp.). Grasses include the native species California brome (*Bromus carinatus*) and small-flowered fescue (*Vulpia microstachys*).

Burnout Ridge

Burnout Ridge is located in the Stanislaus National Forest between Cherry Lake and Intake Switchyard and is a proposed new site for a communication tower. Burnout Ridge is at an elevation of about 5,500 feet, in the yellow pine belt (lower coniferous forest zone) of the western Sierra Nevada. Ponderosa pine is the dominant species with scattered incense cedar, sugar pine (*Pinus lambertiana*), and black oak. Understory shrubs include interior live oak, mountain misery, deerbrush, wooly sunflower, and Sierra gooseberry (*Ribes roezlii)*. The herbaceous layer includes native grasses such as blue wildrye (*Elymus glaucus*), California brome, one-sided bluegrass (Poa secunda) and six-weeks fescue (*Vulpia octoflora*), and native wildflowers such as blue penstemon, pine lupine (*Lupinus albicaulis*), Mariposa lily (*Calochortus leichtlinii*), harvest Brodiaea (*Brodiaea elegans*). Yellow star-thistle (*Centaurea solstitialis),* a California Department of Food and Agriculture listed noxious weed, as well as other non-native invasive pest plants of concern listed by the Stanislaus National Forest, including puncturevine (*Tribulus terrestris*), Italian thistle (*Carduus pycnocephalus*), tocalote (*Centaurea melitensis*), Himalayan blackberry (*Rubus discolor*), cheatgrass (*Bromus tectorum*), and medusahead (*Taeniatherum caput-medusae*) were observed at the Burnout Ridge site during site surveys and addressed in the Weed Risk Assessment prepared for this project.

Cheatgrass (*Bromus tectorum*), a non-native invasive grass species, is also conspicuous. The access route to be developed at this site would follow an old logging road that is characterized by regenerating conifers and shrubs.

Duckwall Mountain

HHW&P is one of several tenants at the site of the Duckwall mountain fire lookout, located at 5,835 feet elevation on the top of Mi-Wuk ridge in between the Moccasin and Cherry Lake areas. The only work to be done at this site as part of this project is the removal of HHW&P equipment, antennas and antenna feed systems. All project-related demolition at Duckwall Mountain would occur within existing developed areas and the site would be accessed by an existing road.

Thresholds of Significance

CEQA Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to vegetation, but considers that implementation of the proposed project would have a significant impact if it were to:

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or US Fish and Wildlife Service.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy ordinance.

NEPA Thresholds (National Park Service/US Forest Service Sites)

This impact assessment focuses on effects of project activities on vegetation communities. Vegetation is negatively affected when it is either temporarily or permanently removed, or when the natural processes that support it, such as hydrology, are interrupted. Disturbance that favors establishment of non-native species also impact vegetation. Non-native species can alter soil chemical and physical properties, hamper native species establishment, and ultimately alter native plant community structure and function. Impacts to vegetation communities were assessed in terms of context, duration, type, and intensity of impact, as discussed below.

Context of Impact

The context of the impact considers whether the impact would be local or regional. For the purpose of this analysis, local impacts are those that would occur within the immediate vicinity of the project site, including the land surrounding the proposed project sites.

Duration of Impact

Long-term impacts are defined as those that can be detected for longer than 20 years. Short-term impacts are defined as those lasting less than 20 years.

Intensity of Impact

The intensity of impacts on vegetation was evaluated by determining the extent to which the Hetch Hetchy Communication System Upgrade Project is proposed within vegetation communities.

- Negligible impacts would have no measurable or perceptible changes in plant community size, continuity, or integrity.
- Minor impacts would be measurable or perceptible and localized within an isolated area and the overall viability of the plant community would not be affected.
- Moderate impacts would cause a change in the plant community (e.g., size, continuity, and integrity); however, the impact would remain localized. The change would be measurable and perceptible, but could be reversed.
- Major impacts would be substantial, highly noticeable, and could be permanent in their effect on plant community size, diversity, continuity, or integrity.

Type of Impact

Impacts were classified as adverse if they would reduce the size, continuity, or integrity of a plant community. Conversely, impacts are considered beneficial if they would increase the size, continuity, or integrity of a plant community.

3.8.3.2 Environmental Consequences

Environmental Consequences of Alternative 1 (No Action)

The No Action Alternative maintains the status quo at all communication facility sites. This alternative provides a basis to compare the action alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Under this alternative, all communication sites would remain in their current state. No impacts on vegetation would be associated with implementation of this alternative.

Environmental Consequences of Alternative 2 (Preferred Alternative)

Alternative 2 would involve a proposed communication system upgrade project at 32 communication facility sites operated by HHW&P. For the majority of the sites, the upgrades would involve replacement or installation of communication equipment in such a manner that ground disturbance would not occur. Existing communication towers would remain in use, with upgraded equipment mounted on the existing towers; or the entire towers and other equipment would be built or replaced in areas that have previously been developed. Access to the sites and staging areas would be on existing roads. At these project sites there would be no impact to vegetation. At four of the 32 sites, project implementation would involve some degree of ground disturbance.

Impacts associated with the Proposed Action are evaluated based on their context, duration, intensity and type. The following tables and discussion provide information regarding the nature of impacts from the proposed project as they relate to vegetation.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	N/A	N/A	N/A	N/A	NI

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	N/A	N/A	N/A	N/A	NI
Moccasin Powerhouse	MPH	N/A	N/A	N/A	N/A	NI
Moccasin Powerhouse Passive Reflector	MPR	N/A	N/A	N/A	N/A	NI
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Oakdale and Moccasin Area Sites

Implementation of proposed communication facility upgrades at the Warnerville Switchyard, Moccasin Peak, Moccasin Powerhouse, and Moccasin Powerhouse Passive Reflector sites would take place within existing developed areas with access routes and staging areas on existing roads. There would be no impacts to vegetation as a result of the upgrades at these sites, and there would be no conflict with local policies or ordinances protecting biological resources.

Impact Determination (Oakdale and Moccasin Areas)**:**

CEQA: No Impact.

NEPA: No Impact.

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Dam Diversion Tunnel	ODT	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Stream Gauge	OSG	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Water Quality Building	OWQ	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Chalet (Cottage 1)	OC1	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Bunkhouse	OBH	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Water Tanks	OWT	N/A	N/A	N/A	N/A	NI
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	N/A	N/A	N/A	N/A	NI
Lake Eleanor-Cherry Lake Tunnel	ECT	N/A	N/A	N/A	N/A	NI
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Long-Term	Negligible	Adverse	LSM
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

Implementation of proposed communication facility upgrades at the O'Shaughnessy and Lake Eleanor Areas would take place within existing developed areas where vegetation has been cleared. No ground disturbance would occur at these sites, and therefore no impact to vegetation would result from construction activities.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas**):**

CEQA: No Impact.

NEPA: No Impact.

Poopenaut Pass

The proposed Poopenaut Pass site consists primarily of rock outcroppings on a relatively steep slope. Due to the site's topography, no flat location in which to place a proposed communication shelter and communication tower is available. Therefore, two options for construction at the site are considered: (1) creation of a flat shelf by building into the hillside, or (2) installation of piers of sufficient height to create a level surface for the shelter and tower. As this is primarily a rock outcropping, site preparation for the new communication tower and modular communication shelter would be very limited, and impacts to vegetation would be negligible. Removal of at least one tree would be required at this site. Best Management Practices, such as providing erosion and sediment control measures, and implementation of Mitigation Measure 2 – Hydrology, implementation of drainage plans that maintain a rate of stormwater runoff that does not exceed pre-project conditions, would prevent indirect impacts to vegetation from soil erosion associated with project activities. Implementation of Mitigation Measure 1- Vegetation, implementation of construction practices to prevent new infestation of noxious weeds at the project sites, would prevent impact on vegetation communities from the introduction and spread of noxious weeds.

Impact Determination (Poopenaut Pass Site**):**

CEQA: Less than significant with mitigation incorporated. NEPA: Local, long-term, negligible, adverse impact.

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	N/A	N/A	N/A	N/A	NI
Cherry Pump Station	CPS	N/A	N/A	N/A	N/A	NI
Cherry Water Tanks	CWT	N/A	N/A	N/A	N/A	NI
Cherry Lake Garage and Warehouse	CGW	N/A	N/A	N/A	N/A	NI
Cherry Lake Camphouse	CCH	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #1	CC1	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #2	CC2	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #3	CC3	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #4	CC4	N/A	N/A	N/A	N/A	NI
Cherry Tower Site	CTS	Local	Short-Term	Minor	Adverse	LS
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Minor	Adverse	LS
Intake Switchyard	ISY	N/A	N/A	N/A	N/A	NI
Kirkwood Powerhouse	KPH	N/A	N/A	N/A	N/A	NI
Holm Powerhouse	HPH	N/A	N/A	N/A	N/A	NI
Duckwall Mountain						
Duckwall Mountain	DWM	N/A	N/A	N/A	N/A	NI
Jones Point						
Jones Point	JPT	N/A	N/A	N/A	N/A	NI
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Moderate	Adverse	LSM

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

All project actions proposed for the existing communication sites in the Cherry Lake area (except for the Cherry Tower Site), Early Intake & Tuolumne River (except for Intake Radio Site) and Duckwall Mountain areas would take place within existing developed areas. No ground disturbance would occur at these sites, and therefore no impacts on vegetation would result from project activities.

Intake Radio Site

The Intake Radio Site is a developed site with existing facilities. Implementation of the Proposed Action at the Intake Radio Site would involve installation of a new communication tower, emergency generator and propane tank, and construction of a modular communication shelter located northeast of the existing facilities. The area that would be cleared for the new facilities is primarily characterized by non-native grassland with some interspersed native grasses and wildflowers. In addition to clearing the project area of non-native grassland, the removal of and/or topping of three trees (one oak and two pines) may also be necessary. The site would be accessed via the existing road to the site.

Construction of new facilities at the Intake Radio site has the potential to contribute to the spread of noxious weeds such as Barbed goatgrass (*Aegilops triuncialis*), and other non-native invasive pest plants of concern listed by the Stanislaus National Forest, including puncturevine (*Tribulus terrestris*), Italian

thistle (*Carduus pycnocephalus*), tocalote (*Centaurea melitensis*), Himalayan blackberry (*Rubus discolor*), cheatgrass (*Bromus tectorum*), and medusahead (*Taeniatherum caput-medusae*), which were observed at this site during surveys and addressed in the Weed Risk Assessment prepared for this project.

Implementation of pre- and post-construction BMPs that minimize ground disturbance and compliance with US Forest Service Standards and Guidelines outlined in the Forest Plan as amended (Stanislaus National Forest *Forest Plan Direction* July 2005), regarding prevention of noxious weeds, and summarized as Mitigation Measure 1 – Vegetation, will reduce the risk of adverse impacts on vegetation communities from the introduction and spread of noxious weeds would result in a less than significant, local, short-term, minor, adverse impacts related to vegetation.

Burnout Ridge

Implementation of the Proposed Action at the Burnout Ridge site would involve installation of a new communication tower, emergency generator, propane tank and pad mounted electrical transformer and modular communication shelter. All vegetation would be cleared within the approximately 6,500-square-foot area to accommodate the new facilities. The vegetation to be cleared consists of approximately seven trees (four black oaks and three ponderosa pines), shrubs, such as mountain misery and deerbrush, and native and non-native grasses and forbs common to the surrounding ponderosa pine forest. In addition, trees that may be hazardous to site workers and public safety would be removed. Dead and dying trees could be hazardous to site workers and public safety as they may have the potential to collapse and possibly injure personnel in the area as a result. Other trees may pose a hazard to site workers and public safety if it obstructs access to and from the site. Felled hazard trees would be left in place within log deficient areas, as identified by the wildlife biologist, or where these are insufficient down logs to comply with National Forest regional soil quality standards, found in the Forest Plan Standards and Guidelines, that minimize the risk of sediment delivery to aquatic systems from management activities. Hazard tree removal would occur adjacent to approximately 1,500 feet of US Forest Service roads used in conjunction with this project, specifically Cherry Oil Road and Road 1N86. Removal of these trees will be in accordance with the guidelines of the Stanislaus National Forest Hazard Tree Procedures for Forest Plan Compliance. The vegetation to be removed is common to the surrounding area, which is currently managed as timber lands, with active logging taking place.

Project activities at the Burnout Ridge site include engineering a 1,500-foot remnant road formerly used by the US Forest Service, connecting the new tower site to an existing well-traveled road. Preparation of the road entails clearing of vegetation that has grown on the old road since it was abandoned, and widening and grading of the roadbed. Trees and stumps to be removed would be chipped and spread or hauled offsite and disposed of appropriately as directed by the US Forest Service.

Construction of new facilities at the Burnout Ridge site has the potential to contribute to the spread of noxious weeds such as yellow star-thistle (*Centaurea solstitialis,*, and other non-native invasive pest plants of concern listed by the Stanislaus National Forest, including puncturevine (*Tribulus terrestris*), Italian thistle (*Carduus pycnocephalus*), tocalote (*Centaurea melitensis*), Himalayan blackberry (*Rubus discolor*), cheatgrass (*Bromus tectorum*), and medusahead (*Taeniatherum caput-medusae*), which were observed at the Burnout Ridge site during site surveys and addressed in the Weed Risk Assessment

prepared for this project. Best Management Practices, such as providing erosion and sediment control measures, and implementation of Mitigation Measure 3 – Hydrology would reduce indirect impacts to vegetation from soil erosion associated with project activities. Compliance with US Forest Service Standards and Guidelines outlined in the Forest Plan as amended (Stanislaus National Forest *Forest Plan Direction* July 2005), regarding prevention of noxious weeds, and summarized as Mitigation Measure 1 – Vegetation, will reduce the risk of adverse impacts on vegetation communities from the introduction and spread of noxious weeds.

With implementation of Mitigation Measure 3 – Hydrology, and Mitigation Measure 1 - Vegetation, construction of the road and clearing of the Burnout Ridge site in preparation of new facilities at the site would result in less than significant, local, short-term, moderate, adverse impacts to vegetation.

Cherry Tower Site

Proposed Actions at the Cherry Tower Site would involve installation of a communication tower, modular communication shelter, emergency generator, and propane tank. The area proposed for the new facilities is located in a clearing in a Ponderosa Pine forest and existing vegetation cover is minimal. The Proposed Actions call for minor clearing of the site to prepare it for new facilities. The proposed site would be accessed via an existing dirt road from the top of the dam along the face of the dam approximately 1/8 mile to the project site. With implementation of pre- and post-construction Best Management Practices that minimize ground disturbance, impacts to vegetation would be less than significant, local, short-term, minor, and adverse.

Impact Determination (Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas)**:**

CEQA: No Impact.

NEPA: No Impact.

Impact Determination (Intake Radio Site)

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

Impact Determination (Burnout Ridge)**:**

CEQA: Less than significant with mitigation.

NEPA: Local, short-term, moderate, adverse impact.

Impact Determination (Cherry Tower Site)**:**

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Alternative 3 is almost identical to Alternative 2, the Preferred Alternative, except that the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the Poopenaut Pass site identified for Alternative 2. Potential short-term and long-term impacts on vegetation would be the same as those described for the Alternative 2. The same facilities would be constructed and installed, but at a different location for the Poopenaut Pass site. The alternative site supports the same vegetation communities and the amount of vegetation to be cleared for this alternative is the same. Implementation of Best Management Practices and Mitigation Measure 1 – Vegetation and Mitigation Measure 3 - Hydrology would reduce short- and long-term effects to vegetation.

Mitigation Measures

Mitigation Measure 1 – Vegetation - SFPUC will review construction practices with its contractors to ensure that all off-road construction equipment, clothing, particularly footwear, and other equipment, including the transport vehicles be free of soil, mud (wet or dried), seeds, vegetative matter or other debris that could contain seeds in order to prevent new infestation of noxious weeds in the project area. Dust or very light dirt which would not contain weed seed is not a concern. The SFPUC will convey the finding of the Weed Risk Assessment to contractors so that where possible, all on- or off-road construction equipment will be kept out of sites infested with noxious weeds. Where it is not possible to keep heavy equipment out of sites infested with noxious weeds, heavy equipment will be cleaned so that it is free of soil, seeds, vegetative matter or other debris prior to being moved from infested sites to un-infested sites and prior to being transported out of the project area. Following construction activities at the Burnout Ridge and Intake Radio Site, monitoring of the new facilities post construction is required to detect new occurrences of noxious weeds and non-native invasive pest plants of concern listed by the Stanislaus National Forest and remove them when detected.

3.8.3.3 Impairment

No impacts to vegetation are expected to be associated with Alternative 1. No impacts are expected to be associated with Proposed Actions at the existing sites for Alternative 2 and 3, while impacts associated with the new sites for Alternative 2 and 3 are expected to be local, short- and long-term, minor to moderate, and adverse. With the implementation of Mitigation Measures (for Vegetation and Hydrology), and adherence to US Forest Service Management Practices (for USFS sites), vegetation of the park and forest would not be impaired for future generations.

3.8.3.4 Cumulative Impacts

Cumulative effects on vegetation are based on analysis of projects in the Hetch Hetchy Communication System Upgrade project area. Vegetation at the project sites has been impacted by development and maintenance of HHW&P facilities, past logging activities in the area, catastrophic fires, and visitor activities. Cumulative impacts from future projects would combine both adverse and beneficial effects. Beneficial effects on vegetation include restoration and rehabilitation while adverse effects would be related to increased development. However, future projects within the project area would be subject to

US Forest Service Management Practices (for USFS sites), Vegetation Management Plan (for National Park Service sites), implementation of Best Management Practices, and Mitigation Measures that minimize ground disturbance, clearing of vegetation, and spread of noxious weeds. Therefore, cumulative impacts would not be adverse.

3.8.4 Wildlife

This section describes the existing wildlife resources of the Hetch Hetchy Communication System Upgrade project area, and evaluates potential impacts of implementing the proposed project on wildlife resources. This analysis focuses on common wildlife resources and impact evaluation thresholds that do not address sensitive resources. Existing conditions and analysis of potential project effects on sensitive biological resources (e.g., special-status species) are addressed in Section 3.7.5 (*Rare, Threatened and Endangered Species*) of this document and in the biological evaluation/biological assessment (BE/BA) prepared for the project (EDAW 2007a).

To evaluate and describe the presence and quality of common and sensitive biological resources on the project sites, and identify potential effects of project implementation on those resources, an EDAW wildlife biologist conducted a reconnaissance survey of the proposed project sites on January 23-25, 2007. Previous site visits were conducted on June 8-10, 2004. Additional site surveys of Poopenaut Pass and Burnout Ridge were completed in June 2005. A focused rare plant survey was conducted on May 30, 2006 at the Poopenaut Pass alternative site. Existing information regarding wildlife resources and regulatory objectives was also obtained from the following sources and reviewed: (1) Biological Evaluation/Biological Assessment of the Hetch Hetchy Water & Power Microwave Replacement Project (EDAW 2007a)[3]; (2) US Fish and Wildlife Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers (USFWS 2000); (3) California Department of Fish and Game (DFG) California Natural Diversity Database (CNDDB 2006); (4) a species list of endangered and threatened species provided by the US Fish and Wildlife Service (USFWS 2007); (5) communications with Roy Bridgman, wildlife biologist on the Groveland Ranger District (Bridgman, pers. comm., 2007); (6) Biological Survey Report for the Hetch Hetchy Water & Power Microwave Replacement Project (EDAW 2007b); and (7) Management Indicator Species (MIS) Report for the Hetch Hetchy Water & Power Communication System Upgrade Project (EDAW 2007c).[4]

3.8.4.1 Affected Environment

The project sites are distributed along an elevation gradient on the west slope of the Sierra Nevada; the types and distribution of wildlife habitats in the project area are strongly influenced by this gradient. The hydrologic, topographic, and elevation variation present in the project area support a diverse mix of plant communities and wildlife habitats, including grassland, chaparral, and foothill pine-oak woodland in the low to mid-elevation range; and primarily conifer forest in the upper elevation range. In addition to biophysical gradients, several other factors affect the distribution and quality of wildlife habitats,

[3] This document is on file at the San Francisco Planning Department, Yosemite National Park, and Stanislaus National Forest Groveland Ranger District and available for public review as part of the project file.
[4] This document is on file at the San Francisco Planning Department, Yosemite National Park, and Stanislaus National Forest Groveland Ranger District and available for public review as part of the project file.

abundance and distribution of species, and animal community structure in portions of the area. These include recreation use, land use patterns and management activities (e.g., agriculture, logging, fuels management), livestock grazing, and natural disturbance regimes (e.g., fire history).

Overall, despite its disturbance history, the project region provides valuable habitat for a variety of wildlife species, including amphibians, reptiles, birds, and mammals. Because many of the project sites are disturbed or are adjacent to disturbed areas, wildlife species utilizing the project area are a combination of those adapted to relatively disturbed or urbanized environments and those that rely on more natural environments with extensive vegetative cover. Species richness is highest during summer months when the resident avifauna is supplemented by common migratory birds.

The following sections summarize habitat functions of the dominant vegetation types in the overall project area. Because many of the project sites are currently disturbed or developed, these descriptions may apply only to the vicinity of some project sites. Descriptions of specific conditions at each project site follow these sections, referencing the habitat descriptions where appropriate.

A Management Indicator Species (MIS) report was completed for the Hetch Hetchy Communication System Upgrade Project (Table 3.8.4-1). Table 3.8.4-1 displays the terrestrial MIS included in the project level analysis. Category 1 MIS are those whose habitat is not in or adjacent to the project area and would not be affected by the project. These species are: Lahonton cutthroat trout, peregrine falcon, willow flycatcher, and Pacific fisher. Category 2 MIS are those whose habitat is in or adjacent to the project area, but would not be directly or indirectly affected by the project; these are: resident trout, great gray owl, northern goshawk, and bald eagle, riparian bird assemblage, oak woodland bird assemblage, meadow edge bird assemblage, mature mixed conifer bird assemblage, and American marten. Category 3 MIS are those whose habitat would be either directly or indirectly affected by the project. Category 3 MIS are pileated woodpecker, mule deer, and western gray school. MIS in Categories 1 or 2 were not considered in the project analysis. Only Category 3 MIS was analyzed in the Management Indicator Species report.

Habitat alterations would not occur at most of the sites. The number and size classes of snags to be removed at the Burnout Ridge site has not been determined, however, it is not expected to affect the overall forest structure, composition, or wildlife habitat relationships (WHR) types and distribution in the Burnout Ridge vicinity. The MIS report indicated that the Proposed Action is not expected to directly or indirectly affect habitat for pileated woodpecker.

Table 3.8.4-1
Stanislaus National Forest Management Indicator Species and Selection of Management Indicator Species for Project-Level Analysis for the Hetch Hetchy Communication System Upgrade Project

Management Indicator Species	Regulatory Status	Forest Plan Habitat Indicator	Category for Project Analysis
Resident Trout	None	Riparian/Instream Habitat	2
Lahonton Cutthroat Trout (Oncorhynchus clarki henshawi)	T	Riparian/Instream habitat; limited range	1
Great Gray Owl	S, CE	Large meadows surrounded by forest with	2

Table 3.8.4-1
Stanislaus National Forest Management Indicator Species and Selection of Management Indicator Species for Project-Level Analysis for the Hetch Hetchy Communication System Upgrade Project

(Strix nebulosa)		abundant snags	
Northern Goshawk (Accipiter gentilis)	S, CSC	Moderately open late seral stage conifer forest at all elevations	2
Bald Eagle (Haliaeetus leucocephalus)	S	Open, mature, uneven-aged forest near lakes or large rivers	2
Peregrine Falcon (Falco peregrinus)	S, FP	Cliffs	1
Pileated Woodpecker (Dryocopus pileatus)	None	Coniferous forest with large snags	3
Willow Flycatcher (Empidonax traillii brewsteri)	S, CE	Wet meadows with willow stands	1
Riparian Bird Assemblage	None	Trees and shrubs near streams and lakes	2
Oak Woodland Bird Assemblage	None	Oak woodland in one or more seral stages	2
Meadow Edge Bird Assemblage	None	Transition zone where forests and meadows meet	2
Mature Mixed Conifer Bird Assemblage	None	Older seral stages of mixed conifer forest	2
American Marten (Martes americana)	S, CSC	High elevation medium to late seral stage forests with riparian and small meadow habitats	2
Pacific Fisher (Martes pennanti)	C, S, CSC	Late seral stage mixed conifer and higher elevation forests	1
Mule Deer (Odocoileus hemionus)	None	Early seral stage forest with meadows, riparian, brush, or other habitat types	3
Western Gray Squirrel (Sciurus griseus)	None	Oak woodlands or mixed conifer and ponderosa pine forests with oak components	3

Category Definitions:
Category 1: MIS whose habitat is not in or adjacent to the project area and would not be affected by the project
Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project
Category 3: MIS whose habitat would be either directly or indirectly affected by the project

Species Regulatory Status:
T – Listed as threatened under the federal Endangered Species Act (ESA)
FPD – Federally proposed for delisting from the ESA
C – Candidate for listing as threatened or endangered under the ESA
S – USFS sensitive species, Region 5 Forester's Species List
FP – Fully Protected under the California Fish and Game Code
CE – Listed as endangered under the California Endangered Species Act (CESA)
CSC – California species of special concern

Mule deer and Western gray squirrel habitat would be affected only at the Burnout Ridge project site as all vegetation would be cleared within the approximately 6,500 sq. ft. area to accommodate the new facilities and addition disturbance of vegetation to prepare the road for access. Although mule deer could use could use these areas as foraging habitat, they probably do not provide fawning habitat or important hiding/thermal cover due to past and ongoing disturbances (e.g., logging, vehicular access). Nearby areas, such as the post-fire habitat matrix around Burnout Ridge, likely provide better conditions for foraging and hiding. The loss and disturbance of vegetation as a result of project implementation at Burnout Ridge would result in a slight reduction of potential mule deer foraging habitat. In general,

habitat loss could contribute to the decline in deer and gray squirrel abundance on the Stanislaus National Forest. However, the availability of habitat where the project would be implemented is not expected to limit deer and gray squirrel populations on the Stanislaus National Forest. In addition, habitat disturbance and loss would be confined to a small area, and there would be no impacts to ratios of forage to cover for mule deer and stands of oak woodland would not be affected for gray squirrels. The MIS report indicated that the project-level habitat impacts are not expected to contribute substantially to existing forest-wide trends.

Wildlife Habitats and Communities

Foothill Pine-Oak Woodland, Chaparral, and Non-native Annual Grassland

Habitats within the lower elevations of the project area primarily include foothill pine-oak woodland, chaparral, and non-native annual grassland. These habitats have been affected by a long history of human land uses, including agricultural uses and development.

In foothill pine-oak woodland, native wildlife species that forage primarily on acorns, including acorn woodpecker (*Melanerpes formicivorus*), western scrub-jay (*Aphelocoma californica*), and western gray squirrel (*Sciurus griseus*) are well-represented. Large trees for perching and nesting adjacent to open foraging areas provide suitable habitat for a diverse raptor community, including red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), Cooper's hawk (*Accipiter cooperii*), and great horned owl (*Bubo virginianus*). Other common birds in oak woodland include black phoebe (*Sayornis nigricans*), western scrub-jay (*Aphelocoma californica*), oak titmouse (*Baeolophus inornatus*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), northern mockingbird (*Mimus polyglottos*), and spotted towhee (*Pipilo maculatus*). Mammals observed or expected to occur in the vicinity of the project area include mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), black-tailed jackrabbit (*Lepus californicus*), raccoon (*Procyon lotor*), opossum (*Didephis virginiana*), and striped skunk (*Mephitis mephitis*). Reptiles and amphibians found in oak woodlands include western rattlesnake (*Crotalus viridis*), western fence lizard (*Sceloporus occidentalis*), kingsnake (*Lampropeltis* spp.), and Pacific treefrog (*Hyla regilla*).

Chaparral generally has lower wildlife diversity than most woodland habitats. However, chaparral does provide habitat for many wildlife species, including some that are considered rare elsewhere. Reptiles found in chaparral include western rattlesnake, western fence lizard, and western whiptail (*Aspidoscelis tigris*). Common birds in chaparral at low elevations include Bewick's wren (*Thryomanes bewickii*), California towhee (*Pipilo crissalis*), and California quail (*Callipepla californica*). Mammals commonly associated with chaparral include gray fox and mule deer.

Annual grasslands generally support lower wildlife diversity when compared to woodland and shrub-dominated habitats but are important to several grassland-associated species in the project area. A great diversity and abundance of insects rely on grasslands. Reptiles found in annual grasslands include western fence lizard and gopher snake (*Pituophis catenifer*). Avian species observed or expected in this area include western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), white-crowned sparrow (*Zonotrichia leucophrys*), savannah sparrow (*Passerculus sandwichensis*), and Brewer's blackbird (*Euphagus cyanocephalus*). Similar to oak woodlands, grasslands support a variety of small

mammals and provide high quality foraging habitat for several raptor species, including red-tailed hawk, Swainson's hawk (*Buteo swainsoni*), northern harrier (*Circus cyaneus*), and ferruginous hawk (*Buteo regalis*). Mammals known to utilize this habitat include California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit, pocket gopher (*Thomomys bottae*), deer mouse (*Peromyscus maniculatus*), house mouse (*Mus musculus*), and coyote.

Conifer Forest

Conifer forest is a common wildlife habitat in the upper elevations of the project region. Most conifer forest in the project area is dominated by ponderosa pine, with a mix of white fir, incense cedar, sugar pine, and other conifer species in some locations. Black oak occurs with ponderosa pine in the lower elevation limits of this habitat type.

The habitat quality and wildlife species composition of conifer forest varies with several factors including seral stage, forest structure (e.g. variation in tree size and canopy closure), plant species composition, and disturbance history. For example, large white fir trees can provide excellent habitat for snag and cavity nesting bird species due to their susceptibility to breaking limbs during wind events and heart rot fungus (Shimamoto 1988). In addition, white fir can provide foraging habitat for insect-gleaning birds, such as warblers, tanagers, and chickadees. Ponderosa pine provides seeds for many bird species, as well as nesting habitat. The bark and foliage of pines are also important food sources for chipmunks (*Tamias* spp.) and deer (McBride 1988).

Open canopy forest areas are favored by some species, such as dusky flycatcher (*Empidonax oberholseri*), western tanager (*Piranga ludoviciana*), and Calliope hummingbird (*Stellula calliope*). Other species prefer more closed canopies, such as golden-crowned kinglet (*Regulus satrapa*), pileated woodpecker (*Dryocopus pileatus*), and California spotted owl (*Strix occidentalis occidentalis*).

Some of the common bird species observed or likely to occur in the project area include: mountain chickadee (*Poecile gambeli*), olive-sided flycatcher (*Contopus borealis*), brown creeper (*Certhia americana*), red-breasted nuthatch (*Sitta canadensis*), golden-crowned kinglet, western tanager, dark-eyed junco (*Junco hyemalis*), northern flicker (*Colaptes auratus*), and Steller's jay (*Cyanocitta stelleri*). Common mammals likely to be present include Douglas' squirrel (*Tamiasciurus douglasii*), golden-mantled ground squirrel (*Spermophilus lateralis*), deer mouse, raccoon, deer, black bear (*Ursus americanus*), and coyote.

The following sections summarize wildlife habitat attributes for each project site. Scientific names for plant species are provided in Section 3.7.3 (*Vegetation*).

Oakdale Area Site (Warnerville Switchyard)

The Warnerville Switchyard site is located in Stanislaus County near the base of the Sierra Nevada foothills, about 2.5 miles southeast of the City of Oakdale. This is the westernmost project site, located at an elevation of about 200 feet above sea level. The site is in a grassland-foothill transitional zone and surrounded by actively managed agricultural fields. The existing facility where project activities will take place is devoid of native vegetation. Wildlife species adapted to high disturbance levels and human development such as rock pigeon (*Columba livia*) or house sparrow (*Passer domesticus*) are likely to

occupy the project site. Several additional wildlife species such as California ground squirrel, western meadowlark, and horned lark, and potentially some special-status wildlife species such as Swainson's hawk, may use the surrounding agricultural areas.

Moccasin Area Sites

The Moccasin Area sites are located within the Sierra Nevada foothills, near the intersection of Highways 49 and 120. The three sites in this area are located at elevations ranging from 1,000 feet to 3,000 feet and are surrounded by common vegetation types of the Sierra Nevada foothills such as chamise chaparral, foothill pine-oak woodland, and non-native annual grassland. Project activities at these sites would occur within existing facilities, which have already been cleared of native vegetation. Wildlife species common to the Sierra Nevada foothills occur in the vicinity of the Moccasin Area sites and may occasionally use the project area sites where they are not excluded by fencing. These include species associated with foothill pine-oak woodland, chaparral, and grassland habitat, which are described above.

Sierra Nevada Sites (Stanislaus National Forest and Yosemite National Park area)

Early Intake and Tuolumne River Area

The five project sites in this area are located between 2,300 feet and 3,600 feet elevation near the confluence of the Cherry Creek and the Tuolumne River. Vegetation types in the area include foothill pine-oak woodland and chamise and manzanita chaparral on the steep south-facing slopes. Black oak woodland and mixed montane hardwood-conifer forests grow on the north facing slopes. Upgrades at the Intake Switchyard, Kirkwood Powerhouse, Holm Powerhouse, and Jones Point sites will take place within existing facilities where vegetation has already been cleared. The wildlife community expected to occur in the vicinity of the project sites is composed of species associated with chaparral, pine-oak woodland, and conifer forest, which are described previously. Additionally, wildlife species common to the deep river canyons of the west slope Sierra Nevada could occur in the vicinity, including mountain lion (*Felis concolor*) and foothill yellow-legged frog (*Rana boylii*).

The Intake Radio Site, where an area adjacent to an existing facility will be cleared for a new tower, is located at an elevation of 4,079 feet and surrounded by open black oak and gray pine woodland. The area to be prepared for the tower pad is a previously cleared area within pine-oak woodland that is characterized by sparse, non-native grassland vegetation. The wildlife community that occurs in the vicinity of this site is composed of species associated with pine-oak woodland, which is described above.

O'Shaughnessy Dam sites

The O'Shaughnessy Dam sites are located at the O'Shaughnessy Dam and on the Tuolumne River below the dam at 3,500 feet to 3,700 feet elevation. The vegetation around these sites is generally dominated by ponderosa pine, black oak, and incense cedar. Also, oak woodland interspersed with rock outcrops occurs in some locations. All project-related upgrades at these sites would occur within existing developed areas or on existing structures. The wildlife community that occurs near the O'Shaughnessy Dam sites is composed of species associated with both pine-oak woodland and conifer forest, and particularly common species tolerant of human disturbance.

Cherry Lake and Lake Eleanor sites

The sites around Cherry Lake and Lake Eleanor are surrounded by ponderosa pine forest with scattered black oak, sugar pine, incense cedar, and white fir. With the exception of the Cherry Tower site, all project-related upgrades at these sites would occur within existing developed areas or on existing structures. The Cherry Tower site is located in an opening in the ponderosa pine forest and is mostly devoid of vegetation. The wildlife community expected to occur in the vicinity of the project sites at Cherry Lake and Lake Eleanor is similar to that described previously for conifer forest habitats. Additionally, various waterfowl species, bald eagle, and osprey use Cherry Lake and Cherry Creek for foraging and breeding habitat.

Burnout Ridge

Burnout Ridge, located in the Stanislaus National Forest between Cherry Lake and Intake Switchyard, is a proposed new site that would support a communication tower. Burnout Ridge is at an elevation of about 5,500 feet, in the yellow pine belt (lower coniferous forest zone) of the western Sierra Nevada. Ponderosa pine is the dominant species with scattered incense cedars, sugar pines, and black oaks. Understory shrubs include interior live oak, mountain misery, deerbrush, wooly sunflower, and Sierra gooseberry. The access route to be developed at this site would follow an old logging road that is characterized by regenerating conifers and shrubs. The wildlife community expected to occur at Burnout Ridge is similar to that previously described for conifer forest habitats.

Poopenaut Pass

Poopenaut Pass is a proposed new site located in Yosemite National Park between the Hetch Hetchy Entrance Station and O'Shaughnessy Dam. The area is located in the yellow pine belt of the western Sierra Nevada. Because of the rocky substrate composed of an exfoliating granitic dome, and a history of frequent fires, the vegetation at this site is sparse and dominated by shrubs such as greenleaf manzanita and deerbrush. Occasional individual ponderosa pines, Jeffrey pines, incense cedars, and Douglas firs occur scattered throughout the site. A few black oaks occur in more sheltered locations near the road. The wildlife community expected to occur at or adjacent to the Poopenaut Pass site is similar to that previously described for conifer forest habitats.

Duckwall Mountain

HHW&P is one of several tenants at the site of the Duckwall mountain fire lookout, located at 5,835 feet elevation on the top of Mi-Wuk ridge in between the Moccasin and Cherry Lake areas. The only work to be done at this site as part of this project is the removal of HHW&P equipment, antennas and antenna feed systems. All project-related demolition at Duckwall Mountain would occur within existing developed areas and the site would be accessed by an existing road. The wildlife community expected to occur at or adjacent to the Duckwall Mountain site is similar to that previously described for conifer forest habitats.

3.8.4.2 Thresholds of Significance

CEQA Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to wildlife, but considers that implementation of the proposed project would have a significant impact if it were to:

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Significance criteria for sensitive wildlife resources (e.g., special-status species) are addressed in Section 3.8.5 (*Rare, Threatened and Endangered Species*).

NEPA Thresholds (National Park Service/US Forest Service Sites)

Impacts to wildlife and their habitats were assessed in terms of type, intensity, and duration of impact, as discussed below. Unless otherwise noted, local impacts were considered to be those that occur in the immediate vicinity of an action or in a nearby area that could be indirectly affected by the action.

Duration of Impact

The duration of impacts to wildlife was characterized as short-term or long-term. Short-term impacts would be expected to last for less than 20 years. All short-term impacts to wildlife and habitat from implementation of an alternative would relate to construction activities and their immediate effects on wildlife. Most of these potential impacts end with completion of construction activity, or soon thereafter, and could include:

- Noise, dust, and light emanating from construction sites could affect the use of surrounding habitats by wildlife.
- Vegetation removed, trampled, or run-over during temporary use of some habitat as areas for staging of machinery or materials would affect wildlife until such areas could be restored after the project.
- Wildlife could be killed by traffic or machinery associated with construction.
- Pits and trenches could entrap wildlife, resulting in their death.
- Spills of fuel, oil, hydraulic fluid, antifreeze, and other toxic chemicals could affect wildlife, especially those in aquatic environments.

Long-term impacts have been defined as those lasting 20 years or longer. Subsequent impact analyses focused primarily on long-term effects of implementation during the operational lifetime of the alternatives that result in changes in the abundance, diversity, and distribution of wildlife species or habitats.

Intensity of Impact

The intensity of impacts on wildlife was evaluated in the following way:

- Negligible impacts are those that would not be measurable or perceptible.
- Minor impacts would be measurable or perceptible; however, they would be localized within a relatively small area, occur over a short-term, and not cause a substantial long-term change in habitat abundance or quality. Minor impacts could affect individuals of some wildlife species but would not affect the distribution, abundance, or long-term viability of a species population or subpopulation. Without further impacts, negative effects could be reversed and the resource would recover.
- Moderate impacts could be sufficient to cause a long-term or permanent change in wildlife habitat quality or abundance, and/or affect individuals of some wildlife species. However, the impact would remain localized and would not substantially affect the distribution, abundance, or long-term viability of a species population or subpopulation.
- Major impacts would be substantial, highly noticeable, and could be permanent in their effect on population or subpopulation viability without active management.

Type of Impact

Impacts were classified as adverse if they would negatively affect the size, continuity, or integrity of wildlife habitat, or result in unnatural changes in the abundance, diversity, or distribution of wildlife species. Conversely, impacts were classified as beneficial if they would positively affect the size, continuity, or integrity of wildlife habitat.

3.8.4.3 Environmental Consequences

This section evaluates potential effects of implementing the project alternatives on common wildlife species and habitats. The relationship of vegetation impacts and effects on wildlife is described within this section. Adverse effects to wildlife without physical modifications to wildlife habitat (e.g., vegetation effects) are also considered. A detailed analysis of potential impacts on sensitive wildlife resources is presented in Section 3.8.5 (*Rare, Threatened and Endangered Species*) of this document and in the Biological Evaluation/Biological Analysis prepared for the project (EDAW 2007a).

Environmental Consequences of Alternative 1 (No Action)

The No Action Alternative maintains the existing conditions, infrastructure, and operations at all communication facility sites. This alternative provides a basis to compare the action alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Under this alternative, all communication sites would remain in their current state. No impacts on wildlife resources would be associated with implementation of this alternative.

Environmental Consequences of Alternative 2 (Preferred Alternative)

Alternative 2 would involve a proposed communication system upgrade project at 32 communication facility sites operated by HHW&P. For the majority of the sites, the upgrades would involve replacement or installation of communication equipment without ground disturbance. Existing communication towers would remain in use, with upgraded equipment mounted on the existing towers; or the entire towers and other equipment would be built or replaced in areas that have previously been developed. Access to the sites and staging areas would be on existing roads. At these project sites there would be no impact to

vegetation. At four of the 32 sites, project implementation would involve some degree of ground disturbance.

Impacts associated with the project are evaluated based on their context, duration, intensity and type. The following discussion is organized into three geographic or management categories: Oakdale and Moccasin Area Sites, Yosemite National Park Sites, and Stanislaus National Forest Sites. Under each category, a table summary of the NEPA and CEQA impact determination for each site is first presented, followed by the supporting analysis for each site or group of sites.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	Local	Long-Term	Minor	Adverse	LS

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	Local	Long-Term	Minor	Adverse	LS
Moccasin Powerhouse	MPH	Local	Long-Term	Minor	Adverse	LS
Moccasin Powerhouse Passive Reflector	MPR	Local	Short-Term Long-Term	Minor Minor	Adverse Beneficial	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Oakdale and Moccasin Area Sites

Warnerville Switchyard and Moccasin Peak

Project activities at the Warnerville Switchyard and Moccasin Peak project sites include installation of new communication facilities within existing developed areas with access routes and staging areas on existing roads. At Warnerville Switchyard, the project involves the removal of a passive reflector and associated 120-foot tower located on the west side of the switchyard. The existing 20-foot communication tower and parabolic dish antenna located adjacent to the existing control building would also be removed. A new 120-foot high lattice type communication tower would be installed adjacent to the existing control building and equipped with one parabolic dish antenna. At Moccasin Peak, a new 60-foot high lattice-type communication tower would be installed with three new parabolic dish antennas. The new tower would be located adjacent to the existing tower and communication building at this site. Because project activities will be confined to existing developed areas, there would be no impacts to wildlife habitat composition or structure.

Short-term, direct impacts as a result of these activities could include temporary disturbances to foraging, movement, and reproductive activities, and temporary displacement of wildlife species, resulting from noise or other project-related factors. However, project activities will be dispersed and localized, and project activities at each location will be completed over a short period. Despite this short disturbance period, project-related noise could disturb individuals and possibly disrupt breeding activities in some locations. Disturbances resulting from project activities would occur within developed sites and the

existing road prism (during access and maintenance), which currently experience noise and other disturbances associated with motorized and non-motorized traffic and routine maintenance. Implementation of this alternative is not expected to disturb foraging, reproductive, or movement behavior of common wildlife species above existing disturbance levels.

Access to the sites along existing roads during construction or future maintenance could result in increased vehicular-related mortality or injury of wildlife. However, the incremental increase in frequency of vehicle access above existing levels, and concomitant effects on population viability of common wildlife species, would be negligible.

Indirect impacts at these two project sites could result from the installation and long-term presence of new communication towers. Migratory and resident bird species could be adversely affected by the presence of a communication tower as a result of collision and mortality. Several factors are thought to influence the likelihood of bird collisions with towers including tower height, lighting, weather and visibility, and migration patterns (Shire et al. 2000). While some species may collide with unlit towers during nighttime migrations (such as ducks), other species might be attracted to lighted towers and then collide with those towers (such as songbirds). This effect has been identified in the mortalities of many songbirds that have been attracted to a lighted tower, then collided with or circled the tower until exhaustion. Other birds, including raptors, might use a new tower for perching.

USFWS (2000) provided guidance on the siting, construction, operation, and decommissioning of communication towers. These guidelines will be followed during design and implementation of this project.[5] The US Fish and Wildlife Service encourages the use of existing towers for multiple users, but if a new tower is proposed, recommends: (1) limiting tower height to less than 199 feet above ground level so that lighting is not required, (2) siting towers outside of known biologically-sensitive areas and bird concentration areas, (3) installing new towers within existing sites or clusters of towers, (4) avoiding the use of guy wires, (5) minimizing the tower footprint, (6), down-shielding lights to keep light within site boundaries, and (7) encouraging use of a site by multiple providers. Both the Moccasin Peak and Warnerville Switchyard towers meet USFWS guidelines for siting and design to minimize effects on resident and migratory birds.

Although the tower specifications incorporate US Fish and Wildlife Service guidelines, occasional bird injuries or mortalities from collisions with the proposed towers could occur. However, the new lattice-type 120-foot tower at the Warnerville Switchyard site would replace an existing 120-foot tower; therefore, there would be no additional risk of avian collisions above existing conditions. At Moccasin Peak, the new 60-foot high lattice-type communication tower and antennas would be installed adjacent to the existing tower and communication building at this site. Any additional risk of avian collisions is expected to be negligible and not likely to affect the viability of common species.

[5] The USFWS guidelines were developed to aid Fish and Wildlife Service staff to minimize impacts under NEPA to species protected by the Migratory Bird Treaty Act. The guidelines represent current research on bird strikes and related mortality from communications towers, and factors that can limit these risks. These guidelines were provided by USFS staff which has been used as the most current information regarding communication towers and bird strikes. Therefore these guidelines were used to aid in the analysis regarding communication towers and bird strikes.

Moccasin Powerhouse and Moccasin Powerhouse Passive Reflector

Project activities at the Moccasin Powerhouse include the removal of existing equipment and installation of a new monopole-type communication tower. The existing parabolic dish antenna and associated support structure would be removed from the roof of the existing powerhouse. A new 80-foot high monopole type communication tower would be installed equipped with one new parabolic dish antenna to replace the existing antenna. No site preparation such as grading would be required. Therefore, there would be no impacts to wildlife habitat composition or structure. Potential direct and indirect impacts are the same as those described for the Warnerville Switchyard and Moccasin Peak sites.

The types and intensity of potential direct impacts at the Moccasin Powerhouse Passive Reflector site as a result of project implementation would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). Potential indirect, long-term effects at this site could be beneficial to wildlife. Because communication equipment would be removed and not replaced, less travel to and disturbance at the project site from maintenance or other project activities are expected.

None of the Moccasin or Oakdale Area sites are expected to be part of important wildlife movement corridors or contain important native wildlife nursery sites. In addition, project activities and new communication system infrastructure at these locations are not likely to interfere substantially with the movement of any native resident or migratory fish or wildlife species.

Impact Determination:

Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse:

CEQA: Less than significant.

NEPA: Local, long-term, minor, adverse impact.

Moccasin Powerhouse Passive Reflector:

CEQA: Less than significant.

NEPA: Local, minor, adverse (short-term) and beneficial (long-term) impact.

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Dam Diversion Tunnel	ODT	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Stream Gauge	OSG	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Water Quality Building	OWQ	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Chalet (Cottage 1)	OC1	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Bunkhouse	OBH	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Water Tanks	OWT	Local	Short-Term	Minor	Adverse	LS
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local	Short-Term	Minor	Adverse	LS
Lake Eleanor-Cherry Lake Tunnel	ECT	Local	Short-Term	Minor	Adverse	LS
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Long-Term	Moderate	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

Implementation of proposed communication facility upgrades at the O'Shaughnessy and Lake Eleanor Areas would occur within existing developed areas where vegetation has been cleared. Project activities at the O'Shaughnessy and Lake Eleanor Area sites include installation of communication cabinets on existing buildings, and installation of some conduits into existing buildings. No ground disturbance would occur at these sites, and therefore no impact to vegetation would result from construction activities. There would be no impacts to wildlife habitat composition or structure.

The types and intensity of potential direct impacts as a result of project implementation would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). Because project activities will be confined to existing developed areas and structures, and no new communication towers would be installed at the O'Shaughnessy and Lake Eleanor Area sites, no long-term impacts to wildlife resources are expected.

Poopenaut Pass

Project activities at the Poopenaut Pass project site include construction of a tower pad into granite outcrops, installation of a 35 to 40-foot tall lattice-type communication tower, security fencing, and a 12-foot by 24-foot communication shelter building.

The proposed Poopenaut Pass site consists primarily of rock outcroppings on a relatively steep slope. Due to the site's topography, there is no flat location on which to place the proposed communication shelter and communication tower. Therefore, two options for construction at the site are considered: (1) creation of a flat shelf by building into the hillside, or (2) installation of piers of sufficient height to create a level surface for the shelter and tower. As this is primarily a rock outcropping, site preparation for the new

communication tower and modular communication shelter would be very limited, and impacts to vegetation would be minor. Removal of at least one tree would be required at this site.

The types and intensity of potential direct impacts as a result of project implementation would be similar to those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). An additional direct impact would be the loss of a small amount of granite outcrop. This feature does not provide significant habitat value for wildlife; and its loss is not expected to affect the viability of wildlife species in the area. Potential indirect impacts on resident and migratory birds as a result of installing a new 35 to 40-foot communication tower are similar to those described for the Warnerville Switchyard and Moccasin Peak sites. Unlike the previously mentioned sites, there are no towers at the Poopenaut Pass site; construction of a new tower at this location could result in a net increase in bird-strike risk. However, tower installation at this site would meet US Fish and Wildlife Service guidelines for siting and design to minimize effects on resident and migratory birds; and the height of this tower would be relatively low (35 feet to 40 feet). Therefore, the risk of avian collisions is expected to be low and not likely to affect the viability of common species. Other potential indirect effects of project implementation, such as disturbances to wildlife associated with future maintenance, access, or other project-related activities at the site, are expected to be negligible.

None of the Yosemite National Park sites are expected to be part of important wildlife movement corridors, or contain important native wildlife nursery sites. In addition, the project activities and new communication system infrastructure at these locations are not likely to interfere substantially with the movement of any native resident or migratory fish or wildlife species.

Impact Determination

Poopenaut Pass:

CEQA: Less than significant.

NEPA: Local, long-term, moderate, adverse impact.

All O'Shaughnessy and Lake Eleanor Sites:

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local	Short-Term	Minor	Adverse	LS
Cherry Pump Station	CPS	Local	Short-Term	Minor	Adverse	LS
Cherry Water Tanks	CWT	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Garage and Warehouse	CGW	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Camphouse	CCH	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Cottage #1	CC1	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Cottage #2	CC2	Local	Short-Term	Minor	Adverse	LS

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake Cottage #3	CC3	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Cottage #4	CC4	Local	Short-Term	Minor	Adverse	LS
Cherry Tower Site	CTS	Local	Long-Term	Moderate	Adverse	LS
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Long-Term	Moderate	Adverse	LS
Intake Switchyard	ISY	Local	Short-Term	Negligible	Adverse	LS
Kirkwood Powerhouse	KPH	Local	Short-Term	Negligible	Adverse	LS
Holm Powerhouse	HPH	Local	Short-Term	Negligible	Adverse	LS
Duckwall Mountain						
Duckwall Mountain	DWM	Local	Short-Term Long-Term	Minor Minor	Adverse Beneficial	LS
Jones Point						
Jones Point	JPT	Local	Short-Term Long-Term	Minor Minor	Adverse Beneficial	LS
Burnout Ridge						
Burnout Ridge	BOR	Local	Long-Term	Moderate	Adverse	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

All project actions proposed for the existing communication sites in the Cherry Lake, Early Intake & Tuolumne River, and Duckwall Mountain areas would take place in existing developed areas. Except at Intake Radio Site (discussed below), no ground disturbance would occur at these sites; and there would be no impacts to wildlife habitat composition or structure.

Project activities at existing Cherry Lake area sites include installation of communication cabinets on existing buildings, installation of some conduits into existing buildings, and a minimal amount of trenching for an underground cable at the Cherry Valve House and Cherry Water Tanks. Potential direct impacts include those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). In addition, a small amount of native vegetation may need to be cleared at the Cherry Water Tanks for installation of an underground cable. This potential short-term vegetation removal is not expected to significantly contribute to changes in habitat structure or composition in the project area. No long-term impacts are expected at any of these sites.

Project activities at existing sites in the Early Intake and Tuolumne River area would occur entirely within existing structures. The types of potential direct impacts as a result of project implementation would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances to wildlife associated with access and construction); however, because activities would be limited to existing structures, the intensity of these potential impacts would be negligible. No long-term impacts are expected.

Project activities at the Duckwall Mountain and Jones Point project sites include the removal of existing communication equipment from these developed sites. The types and intensity of potential direct impacts as a result of project implementation would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). Potential indirect, long-term effects at this site could be beneficial to wildlife. Because communication equipment would be removed and not replaced, less travel to and disturbance at the project site from maintenance or other project activities are expected.

The Intake Radio Site is a developed site with existing facilities. Implementation of Proposed Actions at the Intake Radio Site would involve installation of a new 40-foot communication tower, emergency generator and propane tank, and construction of a modular communication shelter in an area to the northeast of the existing facilities. The area to be cleared for the new facilities is characterized primarily by non-native grassland with some interspersed native grasses and wildflowers. While it would be avoided if feasible, the removal of and/or topping of three trees (one oak and two pines) may be necessary. The types and intensity of potential direct impacts as a result of project implementation would be similar to those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). Additionally, a small amount of grassland habitat and up to three trees would be removed as a result of constructing the new facilities. As described in 3.8.3 (*Vegetation*), implementation of pre- and post-construction Best Management Practices that minimize ground disturbance would minimize the loss of vegetation. Removing a small amount of this common habitat type, particularly within this existing disturbed area, is not expected to significantly contribute to changes in habitat structure or composition or affect the viability of wildlife species in the area. The types and intensity of potential indirect impacts on resident and migratory birds as a result of installing a new 40-foot communication tower are similar to those described for the Warnerville Switchyard and Moccasin Peak sites.

Burnout Ridge

Implementation of the Proposed Action at the Burnout Ridge site would involve installation of a new 120-foot communication tower, emergency generator, propane tank and pad mounted electrical transformer, and modular communication shelter. All vegetation would be cleared within the approximately 6,500 sq. ft. (0.15 acre) area to accommodate the new facilities. The vegetation to be cleared consists of approximately seven trees (four black oaks and three ponderosa pines), shrubs, and native and non-native grasses and forbs common to the surrounding ponderosa pine forest. Additional trees that may be hazardous to site workers and public safety would also be removed. The vegetation to be removed is common to the surrounding area, which is currently managed as timber land with active logging taking place.

Project activities also include improving and re-establishing a 1,500-foot remnant road formerly used by the US Forest Service, connecting the new tower site to an existing well-traveled road. Preparation of the road entails clearing of vegetation that has grown on the old road since it was abandoned, and widening and grading of the roadbed. Also, approximately 6,752 feet of underground cable would be installed within the Burnout Ridge access road right-of-way.

The types and intensity of potential direct impacts as a result of project implementation would be similar to those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). Additionally, 6,500 sq. ft. (0.15 acre) of common wildlife habitat would be permanently removed to accommodate the new facilities; and vegetation would be removed as a result of re-establishing the access road. The access route would follow an old logging road that is recovering from past disturbance. This corridor is characterized by regenerating conifers and shrubs. Although the new facility sites and the access corridor do not provide high-value habitat for wildlife, common bird and mammal species likely use this area for foraging or breeding activities. However, removing 0.15 acre of common wildlife habitat (including approximately seven trees) at the new facility sites, and re-establishing an access road in the previous road corridor, are not expected to significantly contribute to changes in habitat structure (e.g., forest canopy closure, tree size distribution) or composition or affect the viability of common wildlife species in the area.

The types and intensity of potential indirect impacts on resident and migratory birds as a result of installing a new 120-foot communication tower are similar to those described for the Warnerville Switchyard and Moccasin Peak sites. Additionally, development of the access route along the old road corridor could increase motorized or non-motorized use (public or project-related) there, which could result in increased vehicular-related mortality or injury of wildlife over the long-term. Other potential effects of increased use on wildlife behavior depend on several factors, including the type, magnitude, frequency, and predictability of travel or use; location and timing; and the sensitivity of a species based on its life history characteristics (Knight and Cole 1995). It is assumed that individuals of common wildlife species in this area are not particularly sensitive to road-related disturbances. The incremental increase in frequency of vehicle access above existing disturbance levels in the area, and concomitant effects on population viability of common wildlife species (through behavioral effects or mortality), are expected to be minor or negligible. Other potential indirect effects of project implementation, such as disturbances to wildlife associated with future maintenance or other project-related activities at the site, are expected to be negligible.

Cherry Tower Site

Project activities at the Cherry Tower Site would involve installation of a 40-foot communication tower, modular communication shelter, emergency generator, and propane tank. The area proposed for the new facilities is located in a clearing in ponderosa pine forest; existing vegetation cover there is minimal. The proposed site would require minor clearing and preparation to accept a communication tower, modular communication shelter, emergency generator, and propane tank. The proposed site would be accessed via an existing dirt road from the top of the dam along the face of the dam approximately 1/8 mile to the project site. With implementation of pre- and post-construction Best Management Practices that minimize ground disturbance, impacts to vegetation would be minimized.

The types and intensity of potential direct impacts as a result of project implementation would be similar to those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). An additional direct impact would be the loss of a small amount of common habitat as a result of site preparation and clearing. This site does not provide significant habitat value for wildlife; and its loss is not expected to significantly contribute to

changes in habitat structure (e.g., forest canopy closure, tree size distribution) or composition, or affect the viability of common wildlife species in the area.

Potential indirect impacts on resident and migratory birds as a result of installing a new 40-foot communication tower are similar to those described for the Warnerville Switchyard and Moccasin Peak sites. However, unlike those sites, there are no towers at the Cherry Tower site and construction of a new tower could result in a net increase in bird-strike risk. However, tower installation at this site would meet US Fish and Wildlife Service guidelines for siting and design to minimize effects on resident and migratory birds; and the height of this tower would be relatively low (40 feet). Therefore, the risk of avian collisions is expected to be low and not likely to affect the viability of common species. Other potential indirect effects of project implementation, such as disturbances to wildlife associated with future access and maintenance, are expected to be negligible.

None of the Stanislaus National Forest sites are expected to be part of important wildlife movement corridors, or contain important native wildlife nursery sites. In addition, the project activities and new communication system infrastructure at these locations are not likely to interfere substantially with the movement of any native resident or migratory fish or wildlife species.

Impact Determination:

Cherry Tower, Intake Radio, and Burnout Ridge:

CEQA: Less than significant.

NEPA: Local, long-term, moderate, adverse impact.

All Cherry Lake sites except Cherry Tower:

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

Duckwall Mountain and Jones Point:

CEQA: Less than significant

NEPA: Local, minor, adverse (short-term) and beneficial (long-term) impact.

Intake Switchyard, Kirkwood Powerhouse, and Holm Powerhouse:

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Alternative 3 is the same as Alternative 2, the Preferred Alternative, except that the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the Poopenaut Pass site identified for Alternative 2. Potential short-term and long-term impacts on vegetation would be the

same as those described for the Alternative 2. The same facilities would be constructed and installed, but at a different location for the Poopenaut Pass site. The alternative site supports the same vegetation communities and wildlife habitat, and the amount of vegetation to be cleared for this alternative is the same. Potential impacts to wildlife species would also be the same for both alternatives.

3.8.4.4 Mitigation Measures

None required.

3.8.4.5 Impairment

No impacts to wildlife resources are expected to be associated with Alternative 1. Under Alternatives 2 and 3, some direct and indirect impacts to wildlife resources would occur, including some loss of common wildlife habitat, potential disturbances to wildlife foraging or breeding activities, and risk of avian collisions with new communication towers at some sites. Overall, most of these impacts are expected to be local, short- to long-term, minor to moderate, and adverse. Project activities at sites where only removal of existing equipment would occur (Moccasin Powerhouse Passive Reflector, Duckwall Mountain and Jones Point) could have a minor beneficial effect on wildlife. With the implementation of US Fish and Wildlife Service guidelines for siting and design of communication towers to minimize effects on resident and migratory birds, and implementation of pre- and post-construction Best Management Practices that minimize the loss of vegetation, wildlife resources of the park and forest would not be impaired for future generations.

3.8.4.6 Cumulative Impacts

Cumulative effects of the Proposed Action on wildlife resources are based on the direct and indirect effects of the project when considered in combination with the effects of past, present, and planned future actions in the project area and vicinity. Wildlife habitat and communities at each of the project sites have been impacted by development and maintenance of HHW&P facilities, past logging and other management activities in the area, and fire history. Implementation of the proposed project is not expected to substantially contribute to changes in habitat structure (e.g., forest canopy closure, tree size distribution) or composition, or affect the viability of common wildlife species in the area. Therefore, any potential cumulative impacts are expected to be minor and not significant.

3.8.4.7 Conclusion Statement

Impacts on common wildlife resources are summarized below.

Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse:

CEQA: Less than significant.

NEPA: Local, long-term, minor, adverse impact.

Moccasin Powerhouse Passive Reflector, Duckwall Mountain, and Jones Point:

CEQA: Less than significant.

NEPA: Local, minor, adverse (short-term) and beneficial (long-term) impact.

Poopenaut Pass, Cherry Tower, Intake Radio, and Burnout Ridge:

CEQA: Less than significant.

NEPA: Local, long-term, moderate, adverse impact.

All O'Shaughnessy and Lake Eleanor Sites:

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

All Cherry Lake sites except Cherry Tower:

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

Intake Switchyard, Kirkwood Powerhouse, and Holm Powerhouse:

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

3.8.5 Rare, Threatened and Endangered Species

This section describes the existing special-status species (i.e., rare, threatened and endangered plant and animal species) setting of the Hetch Hetchy Communication System Upgrade project area, and evaluates potential impacts of implementing the proposed project on special-status species. Existing conditions and analysis of potential project effects on common biological resources, vegetation communities, and wildlife habitats are addressed in Sections 3.8.3 (*Vegetation*) and 3.8.3 (*Wildlife*) of this document.

EDAW prepared separately a biological evaluation for plant species (Plant BE) (EDAW 2007d) and a biological evaluation/biological assessment for wildlife species (Wildlife BE/BA) (2007a) for this project. These analyses focused specifically on effects of project implementation on: (1) species designated as sensitive by the US Forest Service Regional Forester in Region 5 and/or (2) species listed as endangered or threatened, proposed for listing, or candidates for listing under the federal Endangered Species Act (ESA). In this Environmental Assessment/Initial Study, the Plant Biological Evaluation and Wildlife BE/BA are incorporated by reference where appropriate.

3.8.5.1 Affected Environment

Many sensitive biological resources in California are protected and/or regulated by federal, state, and local plans, policies, regulations, and laws. The following sections provide a summary of those that may be applicable to biological resources in the project area.

Federal

Federal Endangered Species Act

Pursuant to the federal Endangered Species Act, the US Fish and Wildlife Service has regulatory authority over federally listed species. Under the ESA, a permit to "take" a listed species is required for any federal action that may harm an individual of that species. Take is defined under Section 9 of the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under federal regulation, take is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Section 7 of the ESA outlines procedures for federal interagency cooperation to conserve federally listed species and designated critical habitat. Section 7(a)(2) requires federal agencies to consult with USFWS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species. For projects where federal action is not involved and take of a listed species may occur, the project proponent may seek to obtain an incidental take permit under Section 10(a) of the ESA. Section 10(a) allows USFWS to permit the incidental take of listed species if such take is accompanied by a habitat conservation plan that includes components to minimize and mitigate impacts associated with the take.

Clean Water Act

Section 404 of the Clean Water Act (CWA) requires project proponents to obtain a permit from the US Army Corps of Engineers prior to performing any activity that involves any discharge of dredged or fill material into "waters of the United States," including wetlands. Waters of the United States include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Many surface waters and wetlands in California meet the criteria for waters of the United States.

In accordance with Section 401 of the CWA, projects that apply for a USACE permit for discharge of dredged or fill material must obtain water quality certification from the appropriate Regional Water Quality Control Board, in this case the Central Valley RWQCB, indicating that the project will uphold state water quality standards.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements domestically a series of international treaties that provide for migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (US Code Title 16, Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific

collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

US Forest Service

Management direction on US Forest Service lands in the project area is defined in the Stanislaus National Forest Plan (USDA Forest Service 1991). The Forest Plan was amended by the Sierra Nevada Forest Plan Amendment (SNFPA) Final Environmental Impact Statement (EIS) Record of Decision (ROD) (USDA Forest Service 2001) and SNFPA Supplemental EIS ROD (USDA Forest Service 2004). The standards and guidelines of the Forest Plan amendment are described in detail in the ROD (USDA Forest Service 2004a). These and other amendments were incorporated in the Stanislaus Forest Plan Direction (USDA Forest Service 2004).

Current US Forest Service management and regulatory direction for the desired future conditions for threatened, endangered, and sensitive species on the Stanislaus National Forest are included in the following documents:

- Stanislaus National Forest Land and Resource Management Plan (Forest Plan, USDA Forest Service, 1991), as amended;
- US Forest Service Manual and Handbooks (FSM/H 2670);
- National Forest Management Act of 1976 (as amended) (NFMA);
- ESA;
- National Environmental Policy Act (NEPA);
- Recovery Plans that establish population goals for recovery of federally listed species;
- Sensitive species lists and life history accounts;
- Species management plans;
- Species management guides or conservation strategies; and
- Regional Forester policy and management direction;

US Forest Service management direction for threatened, endangered, and sensitive species is summarized below.

Threatened and Endangered Species (FSM 2670.31)

The following summarizes the US Forest Service's general management direction for species listed as threatened or endangered under the Endangered Species Act. This section also summarizes management direction specifically for species listed under the ESA that are addressed in this analysis (valley elderberry longhorn beetle).

1. Place top priority on conservation and recovery of endangered, threatened, and proposed species and their habitats through relevant National Forest System, State and Private Forestry, and Research activities and programs.

2. Establish through the Forest planning process objectives for habitat management and/or recovery of populations, in cooperation with States, the US Fish and Wildlife Service and other Federal agencies.

3. Through the biological assessment process, review actions and programs authorized, funded, or carried out by the US Forest Service to determine their potential for effect on threatened and endangered species and species proposed for listing.

4. Avoid all adverse impacts on threatened and endangered species and their habitat except when it is possible to compensate adverse effect totally through alternatives identified in a biological opinion rendered by the US Fish and Wildlife Service; when an exemption has been granted under the act, or when the USFWS biological opinion recognizes an incidental taking. Avoid adverse impacts on species proposed for listing during the conference period and while their Federal status is being determined.

5. Initiate formal consultation or conference with the USFWS when the US Forest Service determines that proposed activities may have an adverse effect on threatened, endangered, or proposed species or when US Forest Service projects are for the specific benefit of a threatened or endangered species.

6. Identify and prescribe measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species. Protect individual organisms or populations from harm or harassment as appropriate.

Sensitive Species (FSM 2670.32)

The following summarizes the US Forest Service's general management direction for species designated as sensitive by the Regional Forester. The Regional Forester maintains a list of sensitive plants and animals that should be addressed when a project may affect US Forest Service lands.

1. Assist states in achieving their goals for conservation of endemic species.

2. As part of the NEPA process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.

3. Avoid or minimize impacts to species whose viability has been identified as a concern.

4. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat in the area of concern and on the species as a whole.

5. Establish management objectives in cooperation with the states when a project on National Forest System lands may have a significant effect on sensitive species population numbers or distribution. Establish objectives for Federal candidate species, in cooperation with the US Fish and Wildlife Service and the States.

State

California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA), a permit from the California Department of Fish and Game (DFG) is required for projects that could result in the take of a plant or animal species that is state listed as threatened or endangered. Under CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species, but the CESA definition of take does not include "harming" or "harassing," as the ESA definition does. As a result, the threshold for take is higher under CESA than under the ESA. Authorization for take of state-listed species can be obtained through a California Fish and Game Code Section 2080.1 Consistency Determination or a Section 2081 Incidental Take Permit.

California Fish and Game Code Sections 3503 and 3503.5—Protection of Bird Nests and Raptors

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders Falconiformes and Strigiformes), including their nests or eggs. Typical violations of these codes include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Section 3503.5 could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction. This statute does not provide for the issuance of any type of incidental take permit.

California Fish and Game Code—Fully Protected Species

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species and do not provide for authorization of incidental take of fully protected species. DFG has informed nonfederal agencies and private parties that their actions must avoid take of any fully protected species.

California Fish and Game Code Section 1602—Streambed Alteration

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by DFG under Section 1602 of the California Fish and Game Code. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first notifying DFG: substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. DFG's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A DFG streambed alteration agreement must be obtained for any project that would result in an impact on a river, stream, or lake.

Porter-Cologne Water Quality Control Act—California Water Code Section 13000 et seq.

Under the Porter-Cologne Water Quality Control Act, "waters of the state" fall under the jurisdiction of the appropriate Regional Water Quality Control Board. The RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters of the state must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the Clean Water Act.

Data Review

To aid preliminary identification of special-status species that could occur in the project area, the following sources were reviewed: (1) California Native Plant Society *Electronic Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2006); (2) Yosemite National Park's sensitive species list; (3) Regional Forester's (Forest Service Region 5) Sensitive Species List for Stanislaus National Forest; (4) California Department of Fish and Game (DFG) California Natural Diversity Database (CNDDB 2006); (5) a species list of endangered and threatened species provided by the US Fish and Wildlife Service (USFWS 2007); (6) communications with Roy Bridgman, wildlife biologist on the Groveland Ranger District (Bridgman, pers. comm., 2007), and (7) Biological Survey Report for the Hetch Hetchy Water & Power Microwave Replacement Project (EDAW 2007b).

Field Surveys

As part of the preliminary Biological Survey Report for the project (EDAW 2007b), EDAW biologists conducted multiple reconnaissance surveys of all project sites in 2004 and 2005. The purpose of these initial surveys was to identify suitable habitat for special-status species at each of the project sites. The surveys covered areas identified for vegetation removal at each of the project sites and noted any plant communities of special concern, such as wetlands, or plant communities that would have a high potential to contain special-status species.

To further evaluate and describe the known or potential presence of special-status wildlife species on the project site, and identify potential effects of project implementation on those species, an EDAW wildlife biologist conducted an additional reconnaissance survey of the proposed project sites on January 23-25, 2007.

Local Rare, Threatened and Endangered Species

Preliminary initial data review identified 59 special-status plant and 38 special-status animal species that could occur in the project region. It was determined that the project sites, or habitats in the vicinity of project sites, could support five of those plant species and 23 wildlife species. This determination was based primarily on (1) the extent and quality of habitat in or near the project sites documented during the field surveys, and (2) the proximity of the project area to known extant occurrences of the species and the regional distribution and abundance of the species. Although several of these species are not likely to be affected directly or indirectly by the proposed project, all special-status species that could occur in the

vicinity of project sites are carried forward and analyzed here for consistency. These species, their regulatory status, and habitat associations are summarized in Tables 3.8.5-1 and 3.8.5-2.

Table 3.8.5-1
Rare, Threatened and Endangered Plant Species with Potential to Occur at Project Sites

Species	Regulatory Status				Habitat Preference and Blooming Period/Nesting Period
	CDFG	USFWS	USFS	CNPS*	
Plants					
Clarkia australis Small's southern clarkia	--	--	S	1B	Cismontane woodland, lower montane coniferous forest at 2,925-6,695 feet elevation. Blooms mid-June to August.
Clarkia biloba ssp. australis Mariposa clarkia	--	--	S	1B	Chaparral, cismontane woodland at 945-4,600 feet elevation. Blooms May to July
Hulsea brevifolia Short-leaved Hulsea	--	--	S	1B	On granitic or volcanic soil in lower to upper montane coniferous forest from 4,920 – 10,500 feet elevation. Blooms July to mid-August.
Lewisia disepala Yosemite lewisia			S	1B	Montane coniferous forest, pinyon juniper woodland (granitic sand from 4,400 – 7,800').
Mimulus filicaulis slender-stemmed monkeyflower	--	--	S	1B	Vernally mesic, open areas in cismontane woodland and montane coniferous forest from 2,970 to 5,775 feet elevation. Blooms late April to mid-June.
Mimulus pulchellus Pansy monkeyflower	--	--	S	1B	Meadows, seeps and vernally mesic locations in lower montane coniferous forest at 1,900 – 6,500 feet elevation. Blooms mid-April to late May.

Regulatory Status Definitions
USFWS US Fish & Wildlife Service
USFS US Forest Service
CDFG California Department of Fish & Game
CNPS California Native Plant Society

USFWS Listing Categories
E Endangered
T Threatened (legally protected)

USFS Listing Categories
S Sensitive (no formal protection)
W Watchlist (no formal protection)
-- Not listed

State Listing Categories (DFG)
E Endangered
T Threatened (legally protected)
R Rare
-- Not listed

*CNPSCategories
1B Considered rare or endangered in California and elsewhere (but not legally protected under ESA or CESA)
2 Considered rare or endangered in California but more common elsewhere (but not legally protected under ESA or CESA)

Source: EDAW 2007d, USFWS species list, CNPS, USFS pers. com

Table 3.8.5-2
Rare, Threatened and Endangered Animal Species Known or with Potential to Occur at or Near the Project Sites

Species	Regulatory Status			Habitat Association
	CDFG	USFWS	USFS	
Invertebrates				
Valley elderberry longhorn beetle	--	T	--	Requires elderberry (*Sambucus mexicana*) shrubs, typically in riparian habitats.

Table 3.8.5-2
Rare, Threatened and Endangered Animal Species Known or with Potential to Occur at or Near the Project Sites

Species	Regulatory Status			Habitat Association
	CDFG	USFWS	USFS	
Desmocerus californicus dimorphus				
Amphibians and Reptiles				
Foothill yellow-legged frog *Rana boylii*	CSC	--	S	Small to medium sized streams with shallow, flowing water, some cobble-sized substrates, and sparse riparian cover.
Mountain yellow-legged frog *Rana muscosa*	CSC	C, E*	S	Upper elevation lakes, ponds, and slow-moving alpine streams. Almost always found within one meter of water, and associated with montane riparian habitats in lodgepole pine, ponderosa pine, Jeffrey pine, sugar pine, white fir, whitebark pine, and wet meadow vegetation types.
Western pond turtle *Clemmys marmorata*	CSC	--	S	Associated with permanent or semi-permanent water in a variety of habitats, including freshwater marsh, ponds, lakes, and rivers; requires basking sites and suitable upland for egg-laying.
Birds				
Northern goshawk *Accipiter gentilis*	CSC	--	S	In the Sierra Nevada, generally requires mature conifer forests with large trees, snags, downed logs, dense canopy cover, and open understories for nesting; aspen stands are also used for nesting. Foraging habitat includes forests with dense to moderately open overstories, and open understories interspersed with meadows, brush patches, riparian areas, or other natural or artificial openings. Goshawks reuse old nest structures and maintain alternate nest sites.
Cooper's hawk *Accipiter cooperii*	CSC	--	--	Nests in oak woodlands, other mixed evergreen forest, or coniferous forest. Forages in a variety of habitats-from open areas to dense forests.
Sharp-shinned hawk *Accipiter striatus*	CSC	--	--	Nests in coniferous or mixed forests, usually selecting a conifer for the nest tree. Forages in a wide variety of coniferous, mixed, or deciduous woodlands.
Swainson's hawk *Buteo swainsoni*	T	--	S	Nests in large trees within open woodland, riparian forest, or scattered trees. Requires adjacent grasslands or agricultural fields with adequate rodent populations for foraging.
Prairie falcon *Falco mexicanus*	CSC	--	--	Nests on cliff ledges and rock outcrops in dry, open terrain.
American peregrine falcon *Falco peregrinus*	E, FP	--	S	Cliffs or rocky outcrops for nesting. Forages over a variety of habitats but mostly prefers aquatic associated areas where abundant aerial prey is present.
Bald eagle *Haliaeetus leucocephalus*	E, FP	Delisted Aug. 8, 2007	S	Uses ocean shorelines, lake margins, and river courses for both nesting and wintering. Most nests are within one mile of water in large trees with open branches, especially ponderosa pine. Nest tree is typically large, old-growth, or dominant live tree communally in winter.
Osprey	CSC	--	--	Associated strictly with large fish-bearing

Table 3.8.5-2
Rare, Threatened and Endangered Animal Species Known or with Potential to Occur at or Near the Project Sites

Species	Regulatory Status			Habitat Association
	CDFG	USFWS	USFS	
Pandion haliaetus				waters, including ocean shorelines, bays, lakes, and rivers. Nest usually within 0.25 mile of fish-producing water, but may nest up to 1.5 miles from water. Builds large nests in tall trees.
Great gray owl *Strix nebulosa*	E	--	S	Mixed conifer or red fir forest, in or on edge of meadows. Requires large diameter snags in a forest with high canopy closure and cool sub-canopy microclimate.
California spotted owl *Strix occidentalis occidentalis*	--	--	S	Occurs in several forest vegetation types, including mixed conifer, ponderosa pine, red fir and montane hardwood. Nesting habitat is generally characterized by dense canopy closure (i.e., >70%) with medium to large trees and multi-storied stands (i.e., at least two canopy layers). Foraging habitat can include intermediate to late-successional forest with greater than 40% canopy cover.
Mammals				
Pallid bat *Antrozous pallidus*	CSC	--	S	Deserts grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting.
Sierra Nevada mountain beaver *Aplodontia rufa californica*	CSC	--	--	Occurs in riparian habitats with soft, deep soils for burrowing, lush growth of preferred food sources such as willow and alder, and a variety of herbaceous species for bedding material throughout the Sierra Nevada, Cascades, and Klamath Mountains. Vegetation types include wet meadows and willow-alder dominated riparian corridors, typically near water sources. Suitable riparian habitats are characterized by dense growth of small deciduous trees and shrubs near permanent water. Burrows in soft soil. Mountain beavers are generally solitary except during their short breeding system, and spend a high proportion of their time in extensive underground burrow systems with multiple openings, tunnels, and food caches.
Townsend's big-eared bat *Corynorhinus townsendii*	CSC	--	S	Roost sites include caves, tunnels, mines, and buildings.
Spotted bat *Euderma maculatum*	CSC	--	--	Variety of habitats from arid deserts and grasslands to mixed coniferous forests. Feeds over water and along washes; needs rock crevices on cliffs or caves for roosting.
Western mastiff bat *Eumops perotis californicus*	CSC	--	--	Many open, semi-arid to arid habitats including coniferous & deciduous woodlands, coastal scrub, grasslands, chaparral etc. Roosts in crevices in cliff faces, high buildings, trees & tunnels.
Western red bat *Lasiurus borealis*	--	--	S	Found in mixed conifer forests and woodlands on the west slope of the Sierra Nevada
American marten *Martes Americana*	--	--	S	Typically occurs in closed-canopy, mature forest stands with high structural diversity.
Pacific fisher	CSC	C	S	Intermediate to large-tree stages (mature) of

Table 3.8.5-2
Rare, Threatened and Endangered Animal Species Known or with Potential to Occur at or Near the Project Sites

Species	Regulatory Status			Habitat Association
	CDFG	USFWS	USFS	
Martes pennanti pacifica				coniferous forests and deciduous-riparian areas with dense canopy closure.
Vulpes vulpes necator Sierra Nevada red fox	T	--	S	Upper montane and alpine habitats of Sierra Nevada, Cascade, Klamath, and north Coast Ranges. Needs water source and denning sites.

Legal Status Definitions
USFWS US Fish & Wildlife Service
USFS US Forest Service
CDFG California Department of Fish & Game
CNPS California Native Plant Society

USFWS Listing Categories
E Endangered
E* Gabriel, San Jacinto & San Bernadino Mtns. populations only
T Threatened (legally protected)
C Candidate for Listing
FPD Proposed for Delisting

USFS Listing Categories
S Sensitive (no formal protection)

State Listing Categories (CDFG)
E Endangered
T Threatened (legally protected)
FP Protected
CSC California Species of Special Concern

Fifteen of the 38 animal species identified in the initial data review were excluded from further analyses. These species, their regulatory status, and rationale for excluding them from further evaluation are summarized in Table 3.8.5-3. Many of the special-status plant species on the initial lists were excluded from the final analysis because they occur outside of the elevation or expected geographic range of the project sites that would experience vegetation removal. Additional special-status plant species were excluded from the final analysis because suitable habitat for these species was lacking at those sites where Proposed Actions would result in physical changes to the environment. The initial list of special-status plant species for consideration can be found in the Preliminary Biological Survey report (EDAW 2007b).

The Plant Biological Evaluation and Wildlife BE/BA contain known occurrence information on species designated as sensitive by the Regional Forester and species listed under the Endangered Species Act.

3.8.5.2 Thresholds of Significance

CEQA Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to special-status species, but considers that implementation of the proposed project would have a significant impact if it were to:

- Impact any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service directly or through habitat modifications; or
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Table 3.8.5-3
Rare, Threatened and Endangered Animal Species Excluded from Further Analysis

Species	Legal Status			Rationale
	CDFG	USFWS	USFS	
Amphibians and Reptiles				
California tiger salamander *Ambystoma californiense*	--	T	S	Projects are outside of this species geographic range.
Hell Hollow slender salamander *Batrachoseps diabolicus*	--	--	S	Project vicinity is outside of this species geographic range.
Yosemite toad *Bufo canorus*	CSC	--	S	No suitable wet meadow habitat present.
Limestone salamander *Hydromantes brunus*	FP	--	S	Project vicinity is outside of this species geographic range.
California red-legged frog *Rana aurora draytonii*	CSC	T	--	No suitable aquatic habitat present.
Western spadefoot *Scaphiopus hammondii*	CSC	--	--	No suitable vernal pool habitat present.
Birds				
Mountain plover *Charadrius montanus*	CSC	--	S	No suitable wintering habitat present.
Willow flycatcher *Empidonax traillii brewsteri*	E	--	S	No suitable meadow-riparian habitat present.
Mammals				
California wolverine *Gulo gulo*	T, FP	--	S	Rare species; very few recent occurrence records from California; project area is likely below the elevation range of this species; habitat not suitable due to disturbance levels.
Fishes				
Delta smelt *Hypomesus transpacificus*	--	T	S	Project vicinity is outside of this species' geographic range.
San Joaquin roach *Lavinia symmetricus* ssp.	CSC	--	S	Project vicinity is outside of this species' geographic range.
Hardhead *Mylopharodon conocephalus*	--	--	S	Project vicinity is outside of this species' geographic range.
Lahontan cutthroat trout *Oncorhynchus clarki henshawi*	--	T	S	Project vicinity is outside of this species' geographic range.
Paiute cutthroat trout *Oncorhynchus clarki seleniris*	--	T	S	Project vicinity is outside of this species' geographic range.
Central Valley steelhead *Oncorhynchus mykiss*	--	T	S	Project vicinity is outside of this species' geographic range.

Legal Status Definitions
USFWS US Fish & Wildlife Service
USFS US Forest Service
CDFG California Department of Fish & Game
CNPS California Native Plant Society

USFWS Listing Categories
E Endangered
T Threatened (legally protected)

USFS Listing Categories
S Sensitive (no formal protection)

State of CA Listing Categories (DFG)
E Endangered
T Threatened (legally protected)
R Rare
CSC California Species of Special Concern

NEPA Thresholds (National Park Service/US Forest Service Sites)

Impacts to special-status species and their habitats were assessed in terms of type, intensity, and duration of impact, as discussed below. Unless otherwise noted, local impacts were considered to be those that

occur in the immediate vicinity of an action or in a nearby area that could be indirectly affected by the action.

Duration of Impact

The duration of impacts to special-status species was characterized as short-term or long-term. Short-term impacts would be expected to last for less than 20 years. All short-term impacts to special-status species from implementation of an alternative would relate to construction activities and their immediate effects on species or habitats. Most of these potential impacts end with completion of construction activity. Long-term impacts are defined as those lasting 20 years or longer. The impact analysis focused primarily on long-term effects of implementation during the operational lifetime of the alternatives that result in changes in the abundance, diversity, and distribution of special-status species or their habitats.

Intensity of Impact

The intensity of impacts on special-status species was evaluated in the following way:

- Negligible impacts are those that would not be measurable or perceptible.
- Minor impacts would be slightly measurable or perceptible; however, they would be localized within a relatively small area, occur over a short-term, and not cause a substantial long-term change in habitat abundance or quality. Minor impacts could affect individuals of some species but would not affect the distribution, abundance, or long-term viability of a species population or subpopulation. Without further impacts, negative effects could be reversed and the resource would recover.
- Moderate impacts could be sufficient to cause a long-term or permanent change in habitat quality or abundance, and/or affect individuals of some species. However, the impact would remain localized and would not substantially affect the distribution, abundance, or long-term viability of a species population or subpopulation.
- Major impacts would be substantial, highly noticeable, larger in scale, and could be permanent in their effect on population or subpopulation viability without active management.

Type of Impact

Impacts were classified as adverse if they would negatively affect the size, continuity, distribution, or integrity of a species or its habitat. Conversely, impacts were classified as beneficial if they would positively affect these attributes.

3.8.5.3 Environmental Consequences

This section evaluates potential effects of implementing the project alternatives on special-status species. Specific project activities at each site that pertain to biological resources are described in Section 3.8.3 (*Vegetation*) and 3.8.3 (*Wildlife*) and not repeated here.

The impact evaluation for special-status plant species in this analysis was based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the project area; (2) the direct physical loss of habitat; (3) the effective loss of habitat by means such as soil erosion or competition from noxious weed infestations. Impact evaluations determined the location of species in

proximity to the proposed project disturbance, and assessed the sensitivity of a species to impacts (considering rarity, resilience, population size, and distribution of species).

The impact evaluation for special-status animal species in this analysis was based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the project area; (2) the direct physical loss or adverse modification of habitat; (3) the effective loss of habitat (through avoidance or abandonment) due to construction activity or noise, or the species' sensitivity to human disturbance. Also, analysis of potential effects of installing communication towers on migratory and resident birds was based partly on the *US Fish and Wildlife Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* (USFWS 2000).

The Plant BE and Wildlife BE/BA contain known occurrence information on species designated as sensitive by the Regional Forester and species listed under the ESA. This analysis incorporates that information by reference.

Environmental Consequences of Alternative 1 (No Action)

The No Action Alternative maintains the existing conditions, infrastructure, and operations at all communication facility sites. This alternative provides a basis to compare the action alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Under this alternative, all communication sites would remain in their current state. No impacts on special-status species would be associated with implementation this alternative.

Environmental Consequences of Alternative 2 (Preferred Alternative)

Alternative 2 would involve a proposed communication system upgrade project at 32 communication facility sites operated by HHW&P. For the majority of the sites, the upgrades would involve replacement or installation of communication equipment without ground disturbance. Existing communication towers would remain in use, with upgraded equipment mounted on the existing towers; or the entire towers and other equipment would be built or replaced in areas that have previously been developed. Access to the sites and staging areas would be on existing roads. At these project sites there would be no impact to vegetation. At four of the 32 sites, project implementation would involve some degree of ground disturbance.

Impacts associated with the project are evaluated based on their context, duration, intensity and type. The following discussion is organized into three geographic or management categories: Oakdale and Moccasin Area Sites, Yosemite National Park Sites, and Stanislaus National Forest Sites. Under each category, a table summary of the NEPA and CEQA impact determination for each site is first presented, followed by the supporting analysis for each site or group of sites.

There are no habitat conservation plans or other local, regional or state habitat conservation plans in the vicinity of the project sites. Thus, this issue is not discussed further in this analysis.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard (WSY)	Wildlife	Local	Long-Term	Minor	Adverse	LS

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak (MPK)	Wildlife	Local	Long-Term	Minor	Adverse	LS
Moccasin Powerhouse (MPH)	Wildlife	Local	Long-Term	Negligible	Adverse	LS
Moccasin Powerhouse Passive Reflector (MPR)	Wildlife	Local	Short-Term	Negligible	Adverse	LS

CEQA and NEPA Impacts:
NA = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Oakdale and Moccasin Area

Rare, Threatened and Endangered Plants

Implementation of proposed communication facility upgrades at the Warnerville Switchyard, Moccasin Peak, Moccasin Powerhouse, and Moccasin Powerhouse Passive Reflector sites would take place within existing developed areas with access routes and staging areas on existing roads. There would be no impacts to special-status plant species as a result of the upgrades at these sites.

Rare, Threatened and Endangered Wildlife

No special-status wildlife species are expected to use the Warnerville Switchyard, Moccasin Peak, Moccasin Powerhouse, and Moccasin Powerhouse Passive Reflector sites for breeding, foraging, or roosting due to the lack of suitable habitat there. These sites are developed and experience considerable disturbance levels. Because project activities would be confined to existing developed areas and access routes, there would be no impacts to wildlife habitat composition or structure.

Several of the special-status species listed in Table 3.8.5-2, including Swainson's hawk, valley elderberry longhorn beetle, prairie falcon, Cooper's hawk, western red bat, western mastiff bat, Townsend's big-eared bat, pallid bat, and spotted bat, could use habitats in the vicinity of the project sites. Short-term, direct impacts to bird and mammal species as a result of project activities could extend immediately beyond the project sites; these include temporary disturbances to foraging, movement, and reproductive activities of birds and mammals, and temporary displacement of some species, resulting from noise or other project-related factors. However, project activities would be dispersed and localized, and project activities at each location will be completed over a short period. Despite this short disturbance period, project-related noise could disturb individuals and possibly disrupt breeding activities in some locations. Disturbances resulting from project activities would occur within developed sites and the existing road prism (during access), which currently experience noise and other disturbances associated with motorized and non-motorized traffic and routine maintenance. Implementation of this alternative is not expected to

disturb foraging, reproductive, or movement behavior of special-status wildlife species above existing disturbance levels.

Access to the sites along existing roads during construction or subsequent maintenance visits could result in increased vehicular-related mortality or injury of wildlife. However, the likelihood that a special-status species would use the existing access roads is low; also, the incremental increase in frequency of vehicle access above existing levels, and concomitant effects on population viability of any wildlife species, would be negligible.

Indirect impacts to special-status bird species at the Warnerville Switchyard and Moccasin Peak sites could result from the installation and long-term presence of new communication towers at these two project sites. Migratory and resident bird species could be adversely affected by the presence of a communication tower as a result of collision and mortality. Although the project sites do not support suitable habitat for special-status bird species that could occur in the vicinity (e.g., Cooper's hawk, prairie falcon), some of these species could fly over the sites during foraging, daily movements, or migration. Several factors are thought to influence the likelihood of bird collisions with towers, including tower height, lighting, weather and visibility, and avian migration patterns (Shire et al. 2000). While some species may collide with unlit towers during nighttime migrations (such as ducks), others might be attracted to lighted towers and then collide with them (such as songbirds). This effect has been identified in the mortalities of many songbirds that have been attracted to a lighted tower, then collided with or circled the tower until exhaustion. Other birds, including raptors, might use a new tower for perching. Providing perch sites to predatory birds could indirectly result in increased mortality of prey species (e.g., songbirds, small mammals).

USFWS (2000) provided guidance on the siting, construction, operation, and decommissioning of communication towers. These guidelines will be followed during design and implementation of this project. USFWS encourages the use of existing towers for multiple users, but if a new tower is proposed, recommends: (1) limiting tower height to less than 199 feet above ground level, so that lighting is not required; (2) siting towers outside of known biologically-sensitive areas and bird concentration areas; (3) installing new towers within existing sites or clusters of towers; (4) avoiding the use of guy wires; (5) minimizing the tower footprint; (6), down-shielding lights to keep light within site boundaries; and (7) encouraging use of a site by multiple providers. The Moccasin Peak and Warnerville Switchyard tower proposals follow USFWS guidelines for siting and design to minimize effects on resident and migratory birds.

Although the tower specifications incorporate USFWS guidelines, occasional bird injuries or mortalities from collisions with the proposed towers could occur. However, the new lattice-type 120-foot tower at the Warnerville Switchyard site would replace an existing 120-foot tower; therefore there would be no additional risk of avian collisions above existing conditions. At Moccasin Peak, the new 60 foot high lattice-type communication tower and antennas would be installed adjacent to the existing tower and communication building at this site. Any additional risk of avian collisions is expected to be minor and not likely to affect the viability of any special-status species.

Impact Determination (Oakdale and Moccasin Areas)**:**

CEQA: Less than significant impact

NEPA: Local, long-term, minor, adverse impact (Warnerville Switchyard and Moccasin Peak)

Local, long-term, negligible, adverse impact (Moccasin Powerhouse)

Local, short-term, negligible, adverse (Moccasin Powerhouse Passive Reflector)

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery (ODG)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
O'Shaughnessy Dam Diversion Tunnel (ODT)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
O'Shaughnessy Stream Gauge (OSG)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
O'Shaughnessy Water Quality Building (OWQ)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
O'Shaughnessy Chalet (Cottage 1) (OC1)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
O'Shaughnessy Watershed Keeper's Office (Cottage 4) (OC4)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
O'Shaughnessy Bunkhouse (OBH)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
O'Shaughnessy Water Tanks (OWT)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Lake Eleanor						
Lake Eleanor Dam Level Gauge (EDS)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Lake Eleanor-Cherry Lake Tunnel (ECT)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Poopenaut Pass						
Poopenaut Pass (PPP)	Vegetation	Local	Long-Term	Negligible	Adverse	LSM
	Wildlife	Local	Long-Term	Minor	Adverse	LS
CEQA and NEPA Impacts: NA = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

Rare, Threatened and Endangered Plants:

Implementation of proposed communication facility upgrades at the O'Shaughnessy and Lake Eleanor Areas would take place within existing developed areas where vegetation has been cleared. No ground disturbance or would occur at these sites, and therefore no impact to special-status plant species would result from construction activities.

Rare, Threatened and Endangered Wildlife:

No rare, threatened or endangered wildlife species are expected to use the O'Shaughnessy and Lake Eleanor Area sites for breeding, foraging, or roosting due to the developed conditions and existing disturbance levels at the project sites. Implementation of proposed communication facility upgrades at the O'Shaughnessy and Lake Eleanor Areas would occur within existing developed areas where vegetation has been cleared. Project activities at the O'Shaughnessy and Lake Eleanor Area sites include

installation of communication cabinets on existing buildings, and installation of some conduits into existing buildings. No ground disturbance would occur at these sites; therefore, no impact to vegetation would result from construction activities. There would be no impacts to special-status wildlife habitat composition or structure.

Several of the special-status species listed in Table 3.8.5-2, including mountain yellow-legged frog, American peregrine falcon, bald eagle, northern goshawk, California spotted owl, great gray owl, osprey, American marten, Sierra Nevada red fox, may occur in the vicinity of the project sites or in suitable habitats along access routes to the proposed project sites. However, no removal or alteration of habitat for any of these species would occur as part of the proposed activities at the O'Shaughnessy and Lake Eleanor Area sites. Bat species, including western red bat, western mastiff bat, Townsend's big-eared bat, and spotted bat, may occur in the vicinity of the project sites; however, these species are not expected to use project sites (e.g., existing buildings) for roosting due to regular maintenance of facilities and high disturbance levels there. Also, project-related work is expected to be within the range of disturbances associated with current activities at the project sites.

The types, intensity, and likelihood of other direct and indirect impacts resulting from noise, vehicle access, and other project-related factors to special-status bird and mammal species that could occur in the vicinity of project sites would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas)**:**

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Poopenaut Pass

Rare, Threatened and Endangered Plants

The sparsely vegetated granite outcrops that characterize the proposed Poopenaut Pass site provide suitable habitat for five of the species considered in this analysis: *Clarkia australis* (Small's southern clarkia), *Hulsea brevifolia* (short-leaved hulsea), *Lewisia disepala* (Yosemite lewisia), *Mimulus filicaulis* (slender-stemmed monkeyflower) and *Mimulus pulchellus* (pansy monkeyflower) have potential to occur on this site. These species were targeted during focused special-status plant surveys conducted by an EDAW botanist on May 30, 2006. None of these species were encountered during that survey; however, slender-stemmed monkeyflower is known to occur in an area along the side of O'Shaughnessy Dam Road that may be used as a staging area (Acree, pers. comm. 2006). Supplemental surveys for special status plant species were conducted in 2007 by Yosemite National Park staff and the locations of *Mimulus filicaulis* were recorded with a Global Positioning System (GPS) so that they can be fenced prior to construction activities at this site. With implementation of Mitigation Measure 1 – Rare, Threatened and Endangered Species - protection of known populations of slender-stemmed monkeyflower, impacts to rare, threatened and/or endangered species from the proposed project at the Poopenaut Pass project site are expected to be less than significant and local, long-term, negligible and adverse under NEPA. Impacts would be less than significant with mitigation incorporated under CEQA.

Rare, Threatened and Endangered Wildlife

No rare, threatened or endangered wildlife species are expected to use the Poopenaut Pass site for breeding, foraging, or roosting due to the lack of suitable habitat conditions there. The Poopenaut Pass site is primarily a rock outcropping; therefore, site preparation for the new communication tower and modular communication shelter would be very limited, and impacts to vegetation would be minor. Removal of at least one tree would be required at this site. Because the site does not support suitable habitat for special-status species, vegetation disturbances at this site would not affect special-status wildlife habitat composition or structure.

Several of the special-status species listed in Table 3.8.5-2, including American peregrine falcon, great gray owl, Sierra Nevada red fox, western red bat, western mastiff bat, Townsend's big-eared bat, pallid bat, and spotted bat, may occur in the vicinity of the project site or in suitable habitats along the access route to the proposed project site. However, no removal or alteration of habitat for any of these species would occur as part of the proposed activities at the Poopenaut Pass site. Short-term, direct impacts to bird and mammal species as a result of project activities could extend immediately beyond the project sites; these include temporary disturbances to foraging, movement, and reproductive activities of birds and mammals, and temporary displacement of some species, resulting from noise or other project-related factors. However, project activities would be dispersed and localized, and project activities at each location will be completed over a short period. Despite this short disturbance period, project-related noise could disturb individuals and possibly disrupt breeding activities in some locations. Disturbances resulting from project activities would occur within developed sites and the existing road prism (during access), which currently experience noise and other disturbances associated with motorized and non-motorized traffic and routine maintenance. Implementation of this alternative is not expected to disturb foraging, reproductive, or movement behavior of special-status wildlife species above existing disturbance levels.

Potential indirect impacts on resident and migratory birds as a result of installing a new 35 to 40-foot communication tower at the Poopenaut Pass site are similar to those described for the Warnerville Switchyard and Moccasin Peak sites. Migratory and resident bird species could be adversely affected by the presence of a communication tower as a result of collision and mortality. Although the project sites do not support suitable habitat for special-status bird species that could occur in the vicinity (e.g., Cooper's hawk, prairie falcon), some of these species could fly over the sites during foraging, daily movements, or migration. Unlike the Warnerville Switchyard and Moccasin Peak sites, there are no towers at the Poopenaut Pass site and construction of a new tower there could result in a net increase in bird-strike risk. However, tower installation at this site would meet USFWS guidelines for siting and design to minimize effects on resident and migratory birds; and the height of this tower would be relatively low (35 to 40 feet). The risk of avian collisions is expected to be low and not likely to affect the viability of any special-status species.

Impact Determination (Poopenaut Pass**):**

CEQA: Less than significant with mitigation incorporated (Plants)

Less than significant (Wildlife)

NEPA: Local, long-term, negligible, adverse impact (Plants)

Local, long-term, minor, adverse impact (Wildlife)

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House (CVH)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Cherry Pump Station (CPS)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Cherry Water Tanks (CWT)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Garage and Warehouse (CGW)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Camphouse (CCH)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #1 (CC1)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #2 (CC2)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #3 (CC3)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #4 (CC4)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Cherry Tower Site (CTS)	Vegetation	Local	Long-Term	Negligible	Adverse	LS
	Wildlife	Local	Long-Term	Minor	Adverse	LS
Early Intake & Tuolumne River Area						
Intake Radio Site (IRS)	Vegetation	Local	Long-Term	Negligible	Adverse	LS
	Wildlife	Local	Long-Term	Minor	Adverse	LS
Intake Switchyard (ISY)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Kirkwood Powerhouse (KPH)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Holm Powerhouse (HPH)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Jones Point (JPT)	Wildlife	Local	Short-Term	Negligible	Adverse	LS
Duckwall Mountain						
Duckwall Mountain (DVM)	Wildlife	Local	Short-Term	Moderate	Adverse	LSM
Burnout Ridge						
Burnout Ridge (BOR)	Vegetation	Local	Long-Term	Negligible	Adverse	LS
	Wildlife	Local	Long-Term	Minor	Adverse	LS

CEQA and NEPA Impacts:
NA = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

Rare, Threatened and Endangered Plants

All project actions proposed for the existing communication sites in the Cherry Lake (except for the Cherry Tower Site), Early Intake & Tuolumne River (except for Intake Radio Site), Duckwall Mountain, and Jones Point areas would take place in existing developed areas. No ground disturbance would occur at these sites, and therefore no impact to special-status plant species would result from project activities.

The Intake Radio Site is a developed site with existing facilities. The additional area to be cleared for proposed facilities at the Intake Radio Site is comprised of ruderal and grassland vegetation dominated by non-native grasses and forbs. The clearing has a low to moderate potential to provide suitable habitat for the species that potentially occur in the area. No special-status plant species were observed during focused surveys carried out for Small's southern clarkia, short-leaved hulsea, Yosemite lewisia, slender-stemmed monkeyflower and pansy monkeyflower in late May 2006, or during subsequent surveys conducted on

July 19, 2007. Impacts to rare, threatened and/or endangered species resulting from implementation of the proposed project at the Intake Radio Site are expected to be less than significant and local, long-term, negligible and adverse. No mitigation would be required.

Rare, Threatened and Endangered Wildlife

Species Addressed in the Wildlife Biological Evaluation/Biological Assessment

The Wildlife Biological Evaluation/Biological Assessment (BE/BA) describes the known or potential for occurrence of the following species at or near each project site on Stanislaus National Forest lands: bald eagle, California spotted owl (including protected activity centers [PACs]), northern goshawk (including protected activity centers [PACs]), great gray owl, valley elderberry longhorn beetle, western pond turtle, pallid bat, western red bat, Townsend's big-eared bat, Pacific fisher, Sierra Nevada red fox, California wolverine, mountain yellow-legged frog, foothill yellow-legged frog, and 13 additional species. The Wildlife BE/BA also provides a detailed analysis of potential effects of project implementation at Stanislaus National Forest sites on these species. In this Environmental Assessment/Initial Study, the determination of impacts at Stanislaus National Forest sites on those species is based on the findings presented in the BE/BA; however, that information is not repeated here. The following briefly summarizes potential effects on California spotted owl and northern goshawk, because measures to avoid impacts to nesting pairs of these species were developed and required in the BE/BA.

Northern goshawk and California spotted owl are not expected to occur at most of the project site locations, and nesting is not expected in any of the project site locations. Existing access roads cross or pass within 0.5 mile of California spotted owl and northern goshawk Protected Activity Centers in the Cherry Lake and Duckwall Mountain areas. Habitat for these species would not be removed or altered, and potential effects of construction access or other activities (e.g., noise-related disturbances) would be negligible or minor. However, if active nests associated with these PACs are located adjacent to the existing access routes, some disturbances to spotted owl or goshawk nesting attempts could occur. Therefore, as described in the Wildlife BE/BA, a limited operating period (LOP) would be implemented within 0.25 mile of an active spotted owl or goshawk nest. This requirement is incorporated as Mitigation Measure 3 – Rare, Threatened and Endangered Wildlife (Protect Active Spotted Owl and Northern Goshawk Nest Sites).

The following discussion focuses on special-status wildlife species that are not addressed in the BE/BA.

Other Species

No other special-status wildlife species are expected to use the existing sites in the Cherry Lake, Early Intake and Tuolumne River, or Duckwall Mountain Areas for breeding, foraging, or roosting due to the developed conditions and existing disturbance levels at the project sites. All project actions proposed for the existing communication sites in the Cherry Lake, Early Intake & Tuolumne River, and Duckwall Mountain areas would take place in existing developed areas. Except at Intake Radio Site (discussed below), no ground disturbance would occur at these sites; and there would be no impacts to wildlife habitat composition or structure.

Several of the special-status species listed in Table 3.8.5-2 that were not addressed in the Biological Evaluation/Biological Assessment, including Cooper's hawk, sharp-shinned hawk, and osprey, could occur in the vicinity of the project sites or in suitable habitats along access routes to the proposed project sites.

Project activities at existing Cherry Lake area sites include installation of communication cabinets on existing buildings, installation of some conduits into existing buildings, and a minimal amount of trenching for an underground cable at the Cherry Valve House and Cherry Water Tanks. The types, intensity, and likelihood of direct and indirect impacts resulting from noise, vehicle access, and other project-related factors to special-status bird, bat, and other mammal species that could occur in the vicinity of project sites would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites. In addition, a small amount of native vegetation may need to be cleared at the Cherry Water Tanks for installation of an underground cable. This potential short-term vegetation removal is not expected to substantially contribute to changes in wildlife habitat structure or composition in the project area; also, because no suitable habitat for special-status species occurs there, no impacts to special-status habitat would result from trenching. No long-term impacts are expected.

Project activities at existing sites in the Early Intake and Tuolumne River area would occur entirely within existing structures. The types, intensity, and likelihood of direct and indirect impacts resulting from noise, vehicle access, and other project-related factors to special-status bird, bat, and other mammal species that could occur in the vicinity of project sites would be similar those described for the Warnerville Switchyard and Moccasin Peak sites. Because activities would be limited to existing structures, the intensity of these potential impacts would be negligible. No long-term impacts are expected.

Project activities at the Duckwall Mountain and Jones Point project sites include the removal of existing communication equipment from these developed sites. The types and intensity of potential direct impacts as a result of project implementation would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). Potential indirect, long-term effects at this site could be beneficial to wildlife. Because communication equipment would be removed and not replaced, less travel to and disturbance at the project site from maintenance or other project activities are expected.

The Intake Radio Site is a developed site with existing facilities. Implementation of Proposed Actions at the Intake Radio Site would involve installation of a new 40-foot communication tower, emergency generator and propane tank, and construction of a modular communication shelter in an area to the northeast of the existing facilities. The area to be cleared for the new facilities is characterized primarily by non-native grassland with some interspersed native grasses and wildflowers. While it would be avoided if feasible, the removal of and/or topping of three trees (one oak and two pines) may be necessary. The types, intensity, and likelihood of direct and indirect impacts resulting from noise, vehicle access, and other project-related factors to special-status bird, bat, and other mammal species that could occur in the vicinity of project sites would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites. Additionally, a small amount of grassland habitat and up to three trees would

be removed as a result of constructing the new facilities. As described in Section 3.8.3 (*Vegetation*), implementation of pre- and post-construction Best Management Practices that minimize ground disturbance would minimize the loss of vegetation. Removing a small amount of this common habitat type, particularly within this existing disturbed area, is not expected to significantly contribute to changes in habitat structure or composition or affect the viability of wildlife species in the area; also, because no suitable habitat for special-status species occurs there, no impacts to special-status habitat would result from ground disturbance. The types and intensity of potential indirect impacts on resident and migratory birds as a result of installing a new 40-foot communication tower are similar to those described for the Warnerville Switchyard and Moccasin Peak sites. No long-term impacts are expected.

Burnout Ridge

Rare, Threatened and Endangered Plants

Previous surveys and consultation with a US Forest Service botanist identified five species with potential to occur in the impacted area at Burnout Ridge. Small's southern clarkia, short-leaved hulsea, Yosemite lewisia, slender-stemmed monkeyflower and pansy monkeyflower all have the potential to occur on the Burnout Ridge site. No special-status plant species were observed during focused surveys for these five species conducted at the Burnout Ridge site in late May 2006, or during subsequent surveys conducted on July 19, 2007. Impacts to rare, threatened and/or endangered species resulting from implementation of the proposed project at the Burnout ridge project site are expected to be less than significant under CEQA and local, long-term, negligible and adverse under NEPA. No mitigation would be required.

Rare, Threatened and Endangered Wildlife

Species Addressed in the Wildlife Biological Evaluation/Biological Assessment

As discussed previously, the Wildlife BE/BA describes the known or potential for occurrence of the following species at or near each project site on Stanislaus National Forest lands: bald eagle, California spotted owl (including protected activity centers [PACs]), northern goshawk (including protected activity centers [PACs]), great gray owl, valley elderberry longhorn beetle, western pond turtle, pallid bat, western red bat, Townsend's big-eared bat, Pacific fisher, Sierra Nevada red fox, California wolverine, mountain yellow-legged frog, foothill yellow-legged frog, and 13 additional species. The Wildlife BE/BA also provides a detailed analysis of potential effects of project implementation at Stanislaus National Forest sites on these species. In this EA/IS, the determination of impacts at Stanislaus National Forest sites on those species is based on the findings presented in the BE/BA; however, that information is not repeated here. The following discussion focuses on special-status wildlife species that are not addressed in the BE/BA.

Other Species

No other special-status wildlife species are expected to use the Burnout Ridge site or access routes for breeding, foraging, or roosting due to the lack of suitable habitat there. Several of the special-status species listed in Table 3.8.5-2 that were not addressed in the Biological Evaluation/Biological Assessment, including Cooper's hawk, sharp-shinned hawk, western mastiff bat, and spotted bat, could occur in the vicinity of the project site.

Implementation of the Proposed Action at the Burnout Ridge site would involve installation of a new 120-foot communication tower, emergency generator, propane tank and pad mounted electrical transformer, and modular communication shelter. All vegetation would be cleared within the approximately 6,500 sq. ft. (0.15 acre) area to accommodate the new facilities. The vegetation to be cleared consists of approximately seven trees (four black oaks and three ponderosa pines), shrubs, and native and non-native grasses and forbs common to the surrounding ponderosa pine forest. Additional trees that may be hazardous to site workers and public safety would also be removed. The vegetation to be removed is common to the surrounding area, which is currently managed as timber land with active logging taking place.

Project activities also include improving and re-establishing a 1,500-foot remnant road formerly used by the US Forest Service, connecting the new tower site to an existing well-traveled road (Forest Service Road 1N86). Preparation of the road entails clearing of vegetation that has grown on the old road since it was abandoned, and widening and grading of the roadbed. Hazard tree removal would occur adjacent to approximately 1,500 feet of US Forest Service roads used in conjunction with this project, specifically Cherry Oil Road and Road 1N86. Also, approximately 6,752 feet of underground cable would be installed within the Burnout Ridge access road right-of-way.

The types, intensity, and likelihood of potential direct impacts as a result of project implementation would be similar to those described for the Warnerville Switchyard and Moccasin Peak sites (i.e., disturbances, injury, or mortality to wildlife associated with access and construction). Additionally, 6,500 sq. ft. (0.15 acre) of common wildlife habitat would be permanently removed to accommodate the new facilities; and vegetation would be removed as a result of re-establishing the access road. The access route would follow an old logging road that is recovering from past disturbance. This corridor is characterized by regenerating conifers and shrubs. Removing 0.15 acre of common wildlife habitat (including approximately seven trees) at the new facility sites, and re-establishing an access road in the previous road corridor, are not expected to significantly contribute to changes in habitat structure (e.g., forest canopy closure, tree size distribution) or composition. Also, because no suitable habitat for special-status species occurs there, no impacts to special-status habitat would result from project activities.

The types and intensity of potential indirect impacts on resident and migratory birds as a result of installing a new 120-foot communication tower are similar to those described for the Warnerville Switchyard and Moccasin Peak sites. Unlike those sites, there are no towers at the Burnout Ridge site so construction of a new tower there could result in a net increase in bird-strike risk. However, tower installation at this site would meet US Fish and Wildlife Service guidelines for siting and design to minimize effects on resident and migratory birds. The risk of avian collisions is expected to be low and not likely to affect the viability of any special-status species. Occasionally, special-status bird species could use the new tower for perching; however, the Burnout Ridge tower would not likely function as an important perch location due to an abundance of suitable natural perches in the general vicinity. Other potential indirect effects of project implementation, such as disturbances to wildlife associated with future access and maintenance, are expected to be negligible.

Additionally, development of the access route along the old road corridor could increase or facilitate motorized or non-motorized use (public or project-related) there, which could result in increased vehicular-related mortality or injury of wildlife over the long-term. Other potential effects of increased use on wildlife behavior depend on several factors, including the type, magnitude, frequency, and predictability of travel or use; location and timing; and the sensitivity of a species based on its life history characteristics (Knight and Cole 1995a, b). The incremental increase in frequency of vehicle access above existing disturbance levels in the area, and concomitant effects on population viability of any wildlife species (through behavioral effects or mortality), are expected to be negligible or minor. Habitat conditions in the vicinity are considered marginal or unsuitable for special-status wildlife species due to the disturbance history there (e.g., intensive logging, severe fire). Therefore, although they could occur in some locations, special-status species are not expected to regularly use areas adjacent to the access corridor. Other potential indirect effects of project implementation, such as disturbances to wildlife associated with future maintenance or other project-related activities at the site, are expected to be negligible.

Cherry Tower Site

Rare, Threatened and Endangered Plants

The location identified for proposed facilities at the Cherry Tower Site occurs in a clearing in the forest near the face of Cherry Lake Dam and is mostly devoid of vegetation. The site will require only minimal clearing in preparation of the tower installation. The footprint of the new tower and associated facility has a low potential to provide suitable habitat for the special-status species with potential to occur in the area. Impacts to rare, threatened and/or endangered plant species resulting from project activities at the Cherry Tower site are expected to be less than significant under CEQA and local, long-term, negligible and adverse under NEPA. No mitigation would be required.

Rare, Threatened and Endangered Wildlife

Species Addressed in the Wildlife Biological Evaluation/Biological Assessment

As discussed previously, the determination of impacts at Stanislaus National Forest sites on species addressed in the Wildlife BE/BA is based on the findings presented in the BE/BA; that information is not repeated here. The following discussion focuses on special-status wildlife species that are not addressed in the BE/BA.

Other Species

Project activities at the Cherry Tower Site would involve installation of a 40-foot communication tower, modular communication shelter, emergency generator, and propane tank. The area proposed for the new facilities is located in a clearing in ponderosa pine forest; existing vegetation cover there is minimal. The proposed site would require minor clearing and preparation to accept a communication tower, modular communication shelter, emergency generator, and propane tank. The proposed site would be accessed via an existing dirt road from the top of Cherry Lake Dam along the face of the dam approximately 0.13 mile to the project site.

A potential direct impact would be the loss of a small amount of common habitat as a result of site preparation and clearing. However, no special-status wildlife species are expected to use the Cherry Tower site for breeding, foraging, or roosting due to the developed conditions and existing disturbance levels at the project site. Vegetation loss there is not expected to significantly contribute to changes in habitat structure (e.g., forest canopy closure, tree size distribution) or composition or affect the viability of any wildlife species in the area. With implementation of pre- and post-construction Best Management Practices that minimize ground disturbance, impacts to vegetation would be minimized.

Several of the special-status species listed in Table 3.8.5-2, including Cooper's hawk, sharp-shinned hawk, western mastiff bat, and spotted bat, could occur in the vicinity of the project site or in suitable habitats along access routes to the proposed project sites. The types, intensity, and likelihood of other direct and indirect impacts resulting from noise, vehicle access, and other project-related factors to special-status wildlife species that could occur in the vicinity of project sites would be the same as those described for the Warnerville Switchyard and Moccasin Peak sites.

Potential indirect impacts on resident and migratory birds as a result of installing a new 40-foot communication tower are similar to those described for the Warnerville Switchyard and Moccasin Peak sites. Unlike those sites, there are no towers at the Cherry Tower site and construction of a new tower there could result in a net increase in bird-strike risk. However, tower installation at this site would meet US Fish and Wildlife Service guidelines for siting and design to minimize effects on resident and migratory birds; and the height of this tower would be relatively low (40 feet). The risk of avian collisions is expected to be low and not likely to affect the viability of any special-status species. Other potential indirect effects of project implementation, such as disturbances to wildlife associated with future access and maintenance, are expected to be negligible.

Impact Determination (Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas):

CEQA: Less than significant (Cherry Pump Station, Cherry Water Tanks, Intake Switchyard, Kirkwood Powerhouse, Holm Powerhouse, Jones Point) (Wildlife)

Less than significant with mitigation incorporated (Cherry Valve House, Cherry Lake Garage and Warehouse, Cherry Lake Camphouse, Cherry Lake Cottages #1-4, Duckwall Mountain) (Wildlife)

NEPA: Local, short-term, moderate, adverse (Cherry Valve House, Cherry Lake Garage and Warehouse, Cherry Lake Cottages #1-4, Duckwall Mountain) (Wildlife)

Local, short-term, negligible, adverse (Cherry Pump Station, Cherry Water Tanks, Kirkwood Powerhouse, Holm Powerhouse, Jones Point) (Wildlife)

Impact Determination (Intake Radio Site):

CEQA: Less than significant (Plants)

Less than significant (Wildlife)

NEPA: Local, long-term, negligible, adverse (Plants)

Local, long-term, minor, adverse (Wildlife)

Impact Determination (Burnout Ridge):

CEQA: Less than significant (Plants)

Less than significant (Wildlife)

NEPA: Local, long-term, negligible, adverse (Plants)

Local, long-term, minor, adverse (Wildlife)

Impact Determination (Cherry Tower Site):

CEQA: Less than significant (Plants and Wildlife)

NEPA: Local, long-term negligible, adverse (Plants)

Local, long-term, minor, adverse (Wildlife)

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Rare, Threatened and Endangered Plants

Alternative 3 is the same as Alternative 2, the Preferred Alternative, except that the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the Poopenaut Pass site identified for Alternative 2. The alternative Poopenaut Pass site has the same potential to provide suitable habitat for the five plants mentioned above and potential short-term and long-term impacts are expected to be the same as those described for Alternative 2. Implementation of Mitigation Measures 1 – Rare, Threatened and Endangered Species, would reduce short- and long-term effects to special-status species.

Rare, Threatened and Endangered Wildlife

Alternative 3 is the same as Alternative 2, the Preferred Alternative, except that the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the Poopenaut Pass site identified for Alternative 2. Potential short-term and long-term impacts on vegetation would be the same as those described for the Alternative 2. The same facilities would be constructed and installed, but at a different location for the Poopenaut Pass site. The alternative site supports the same vegetation communities and wildlife habitat, and the amount of vegetation to be cleared for this alternative is the same. Potential impacts to special-status wildlife species would also be the same for both alternatives.

3.8.5.4 Mitigation Measures

Mitigation Measure 1 – Rare, Threatened and Endangered Plants: Protect Known Occurrences of Special-status Plant Species – The SFPUC will notify NPS Resource management staff two weeks in advance of construction activities at the Poopenaut Pass project site so that known occurrences of *Mimulus filicaulis* at that site will be fenced by NPS staff. Any construction related activities shall be

restricted to the outside of the fenced-off area, and the fencing shall remain present for the duration of the construction.

Mitigation Measure 2 – Special Species Wildlife: Protect Active Spotted Owl and Northern Goshawk Nest Sites – Prior to implementation of the Proposed Action, the SFPUC will conduct surveys for California spotted owl and northern goshawk in the identified Protected Activity Centers (and other suitable habitat in the action area if necessary) to determine whether active nest sites associated with these PACs are located within 0.25 mile of project activities, including construction access routes. If the US Forest Service/National Park Service wildlife biologists determine that existing information is current and sufficient, these surveys may not be necessary.

If active nest sites are determined to exist within 0.25 mile of project activities, the SFPUC will implement limited operating periods (LOPs) within 0.25 mile of active nest sites prior to commencement of any project construction activities to avoid construction or access-related disturbances to breeding activities and habitat of California spotted owl and northern goshawk. A Limited Operating Period constitutes a period during which project activities will not occur, and will be enforced in project implementation contracts as follows:

- An LOP between February 15 and September 15 will be imposed within 0.25 mile of an active nest site. The main access road to Cherry Lake passes within 0.5 mile of PAC 54-36 and 54-21; and the access road to some sites on Yosemite National Park lands (Lake Eleanor) passes through PAC 54-13. Although these sites will be accessed on existing roads, and potential effects of access-related disturbances to nesting attempts are expected to be minor, implementing the LOP within 0.25 mile of an active nest would avoid potential disturbances.
- An LOP between March 1 and August 31 will be imposed within 0.25 mile of an active spotted owl nest site. The access road (1N07) to all of the Cherry Lake sites passes through PAC TL029. Although these sites will be accessed on existing roads, and potential effects of access-related disturbances to nesting attempts are expected to be minor, implementing the LOP within 0.25 mile of an active nest would avoid potential disturbances.

3.8.5.5 Impairment

Rare, Threatened and Endangered Plants

No impacts to special-status species are expected to be associated with Alternative 1. No adverse impacts are expected to be associated with Proposed Actions at the existing sites for Alternative 2 and 3, while impacts associated with the new sites for Alternative 2 and 3 are expected to be local, long-term, negligible to minor, and adverse. With the implementation of BMPs, and Mitigation Measures 1 – Rare, Threatened and Endangered Plants for special-status plant species special-status species of the park would not be impaired for future generations.

Rare, Threatened and Endangered Wildlife

No impacts to special-status wildlife resources are expected to be associated with Alternative 1. Under Alternatives 2 and 3, some direct and indirect impacts to wildlife resources would occur, including some loss of common wildlife habitat, potential disturbances to wildlife foraging or breeding activities, and risk

of avian collisions with new communication towers at some sites. Overall, most of these impacts are expected to be local, short- to long-term, minor to moderate, and adverse. Project activities at sites where only removal of existing equipment would occur (Moccasin Powerhouse Passive Reflector, Duckwall Mountain, and Jones Point) could have a minor beneficial effect on wildlife. With the implementation of USFWS guidelines for siting and design of communication towers to minimize effects on resident and migratory birds, Mitigation Measure 2 – Rare, Threatened and Endangered Wildlife, and implementation of pre- and post-construction BMPs that minimize the loss of vegetation, special-status wildlife resources of the park would not be impaired for future generations.

3.8.5.6 Cumulative Impacts

Cumulative effects of the Proposed Action on special-status wildlife resources are based on the direct and indirect effects of the project when considered in combination with the effects of past, present, and planned future actions in the project area and vicinity.

Rare, Threatened and Endangered Plants

Potential habitat for special-status species at each of the project sites has been impacted by development and maintenance of HHW&P facilities, logging in the area, or catastrophic fires. Future projects within the project area would be subject to either BMPs or US Forest Service Standards and Guidelines (for sites on the Stanislaus National Forest) and Mitigation Measures that minimize ground disturbance and disturbance of habitat for special-status species. Therefore, cumulative impacts would not be adverse.

Rare, Threatened and Endangered Wildlife

Wildlife habitat and communities at each of the project sites have been impacted by development and maintenance of HHW&P facilities, past logging and other management activities in the area, and fire history. Implementation of the proposed project is not expected to substantially contribute to changes in special-status wildlife habitat structure (e.g., forest canopy closure, tree size distribution) or composition or affect the viability of special-status wildlife species in the area. Therefore, any potential cumulative impacts are expected to be minor and not significant.

3.8.5.7 Conclusion Statement

Impacts on special-status plant and wildlife species are summarized below:

Warnerville Switchyard, All Moccasin Area Sites, O'Shaughnessy Sites, Lake Eleanor Sites, Cherry Pump Station, Cherry Water Tanks, Cherry Tower, Early Intake & Tuolumne River Area Sites Except Intake Radio Site, and Jones Point

CEQA: Less than significant

NEPA: Local, short- to long-term, negligible to minor, adverse impact.

Poopenaut Pass; All Cherry Lake Sites Except Cherry Pump Station, Cherry Water Tanks, and Cherry Tower; Intake Radio; Duckwall Mountain; and Burnout Ridge

CEQA: Less than significant with mitigation.

NEPA: Local, short- to long-term, negligible to moderate, adverse impact.

3.8.6 Air Quality

This section describes the existing air quality setting of the Hetch Hetchy Communication System Upgrade project site areas, including a description of existing air quality conditions in the vicinity of the project sites.

3.8.6.1 Affected Environment

The Oakdale Area site is located within the San Joaquin Valley Air Basin (SJVAB), under the jurisdiction of San Joaquin Valley Air Pollution Control District (SJVAPCD). The Moccasin, Duckwall Mountain, Early Intake and Tuolumne River, Cherry Lake and Lake Eleanor, and Poopenaut Pass and O'Shaughnessy area sites are located within the Mountain Counties Air Basin (MCAB), under the jurisdiction of the Tuolumne County Air Pollution Control District (TCAPCD). Air quality in these areas is also regulated by the US Environmental Protection Agency (EPA) and California Air Resources Board (CARB). Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate.

The SJVAB and MCAB are well-defined climatic regions with distinct topographic features. The Coast Ranges, which have an average elevation of 3,000 feet, are located on the western border of the SJVAB. The San Emigdio Mountains, which are part of the Coast Ranges, and the Tehachapi Mountains, which are part of the Sierra Nevada, are both located on the south side of the SJVAB. The Sierra Nevada forms the eastern border of the SJVAB and the western border of the MCAB. Air flows into the SJVAB and MCAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin River Delta from the San Francisco Bay Area. The surrounding mountains create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution.

The climate types of the SJVAB and MCAB are a result of the topography and the strength and location of a semipermanent, subtropical high-pressure cell. During summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface as a result of the northwesterly flow produces a band of cold water off the California coast.

The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. Precipitation and fog tend to reduce or limit some pollutant concentrations. For instance, clouds and fog block sunlight, which is required to fuel photochemical reactions that form ozone. Because carbon monoxide (CO) is partially water-soluble, precipitation and fog also tend to reduce concentrations in the atmosphere. In addition, respirable and fine particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}) can be washed from the atmosphere through wet deposition processes (e.g., rain). However, between winter storms, high pressure and light winds lead to the creation of low-level temperature inversions and stable atmospheric conditions, resulting in the concentration of air pollutants (e.g., CO and PM_{10}).

Summer is characterized by poor air movement in the mornings and by longer daylight hours, which provides a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and nitrogen oxides (NO_X). These photochemical reactions result in ozone formation. During the summer, wind speed and direction data indicate that summer wind usually originates at the north end of the San Joaquin Valley and flows in a south-southeasterly direction through the San Joaquin Valley, through Tehachapi Pass, and into the Southeast Desert Air Basin and MCAB (SJVAPCD 2002).

Air quality regulations focus on the following air pollutants: ozone, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM_{10}, respirable and fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead, for which the concentration thereof are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health, and because there is extensive documentation available on health-effect criteria for these pollutants, they are commonly referred to as "criteria air pollutants."

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). The EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. General conformity requirements were also adopted by Congress as part of the CAAA and were implemented by EPA regulations in 1993. General conformity requires that all federal actions conform to the SIP as approved or promulgated by EPA. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain NAAQS. Before a federal action is taken, it must be evaluated for conformity with the SIP. All reasonably foreseeable emissions, both direct and indirect, that are predicted to result from the action are taken into consideration. The location and quantity of emissions must be identified. If it is found that the action would create emissions above de minimis threshold levels specified in EPA regulations, or if the activity is considered regionally significant because its emissions

exceed 10% of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the project into conformance.

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish California ambient air quality standards (CAAQS). CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS.

SJVAPCD and TCAPCD seek to improve air quality conditions in Stanislaus and Tuolumne counties through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of SJVAPCD and TCAPCD include preparing plans and programs to attain ambient air quality standards, adopting and enforcing rules and regulations, and issuing permits for stationary sources. SJVAPCD and TCAPCD also inspect stationary sources, respond to citizen complaints, monitor ambient air quality and meteorological conditions, and implement other programs and regulations required by the CAA, CAAA, and CCAA.

Both CARB and EPA use monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. With respect to ozone, Stanislaus County is currently designated as a nonattainment area for the state 1-hour (severe) and national 8-hour (serious) ambient air quality standards (CARB 2007, EPA 2007). Tuolumne County is also currently designated as a nonattainment area for the state 1-hour (serious) and national 8-hour ambient air quality standards. With respect to particulate matter, Stanislaus County is designated as a nonattainment area for the both the state and national PM_{10} and $PM_{2.5}$ (i.e., respirable particulate matter with an aerodynamic diameter of 10 and 2.5 micrometers or less, respectively) ambient air quality standards (CARB 2007). For all other state and national ambient air quality standards, Stanislaus and Tuolumne counties are designated as an attainment and/or unclassified area.

Sensitive receptors are identified areas that would be used by persons most sensitive to the effects of air pollution, such as the very young, the elderly, or people weak from illness or disease. These receptors are generally residential land uses, schools, hospitals, and retirement homes. Existing nearby sensitive receptors include single-family residential dwellings located along Warnerville Road, near the entrance to the Warnerville Switchyard Site, and in the town of Moccasin, near the Moccasin Powerhouse site. The other project sites are located in rural and remote areas of the counties.

3.8.6.2 Thresholds of Significance

CEQA Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to air quality, but considers that implementation of the proposed project would have a significant impact if it were to:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations, or
- Create objectionable odors affecting a substantial number or people.

NEPA Thresholds (National Park Service/US Forest Service Sites)

Context of Impact

The context considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within the immediate vicinity of the Proposed Action, unless otherwise noted.

Duration of Impact

Short-term impacts would be impacts created through the construction phase of the alternative action. Long-term impacts would be impacts created through permanent changes in air quality emissions, and which are expected to prevail following implementation of the alternative action.

Intensity of Impact

The intensity of an impact considers whether the impact is judged negligible, minor, moderate, or major relative to baseline conditions (No Action Alternative). For this analysis, air quality impacts are based on the degree of predicted change in emissions from the No Action Alternative.

For purposes of this analysis, negligible impacts are those that would be barely perceptible and confined to a small area. Minor impacts would be perceptible and remain localized and confined. Moderate impacts would be sufficient to cause a change in air quality. Major impacts would result in substantial and highly noticeable changes in air quality.

Type of Impact

Impacts were considered beneficial or adverse to air quality. Beneficial air quality impacts would reduce emissions or lower pollutant concentrations, while adverse impacts would increase emissions or raise pollutant concentrations.

3.8.6.3 Environmental Consequences

Environmental Consequences of Alternative 1 (No Action)

The No Action Alternative maintains the status quo at all communication facility sites. This alternative provides a basis to compare the action alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Under this alternative, all communication sites would remain in their current state. No impacts would be associated with this alternative.

Environmental Consequences of Alternative 2 (Preferred Alternative)

Impacts associated with the project are evaluated based on their context, duration, intensity and type. The following tables and discussion provide information regarding the nature of impacts from the proposed project as they relate to air quality. None of the project alternatives would create objectionable odors affecting a substantial number of people. Thus, this issue is not discussed further in this analysis.

Project-Generated, Construction-Related Air Pollutant Emissions

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	Local	Short-Term	Minor	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Oakdale Area Site

The Oakdale Area site is located in Stanislaus County, with is under the jurisdiction of the SJVAPCD. Implementation of proposed communication facility upgrades at the Oakdale Area site would take place within existing developed areas. Preparation of the communication tower foundations at Warnerville Switchyard would require the removal of existing asphalt paving where the new tower would be located, followed by the construction of the new tower foundation. Construction-related activities would result in project-generated emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG and NO_X) from heavy-duty on-site equipment, material transport, and worker commute exhaust emissions; and ground disturbance. Exact project-specific data (e.g., construction equipment types and number requirements, and maximum daily acreage disturbed) were not available at the time of this analysis, but on-site equipment for installation of concrete foundations would likely include backhoes, excavators, compactors, concrete trucks, cranes, and augers. Worst-case project-generated, construction-related emissions of regional criteria air pollutants and precursors were modeled in accordance with SJVAPCD-recommended methodologies based on general information provided in the project description and default model settings and parameters.

Table 3.8.6-1 summarizes the modeled project-generated, construction-related emissions of criteria air pollutants and precursors from foundation installation. Construction-related air quality effects were determined by comparing these modeling results with applicable SJVAPCD significance thresholds. As

shown Table 3.8.6-1, foundation installation would result in total unmitigated emissions of approximately 11 lb/day (1 tpy) of ROG and 59 lb/day (8 tpy) of NOx, which would not exceed SJVAPCD's threshold of 10 tpy. With respect to PM_{10}, all construction activities at the Warnerville Switchyard site would comply with SJVAPCD's Regulation VIII, "Fugitive Dust Prohibitions," and all applicable control measures would be implemented, as required by law.

Table 3.8.6-1
Summary of Modeled Worst-Case Construction-Related
Criteria Air Pollutant and Precursor Emissions

Source	Emissions (lb/day) 1				Emissions (tpy) 1			
	ROG	CO	NOx	PM10	ROG	CO	NOx	PM10
FOUNDATION INSTALLATION								
Total Unmitigated (Site Preparation)	10.9	45.1	58.6	40.8	1.4	5.9	7.7	5.4
SITE PREPARATION								
Total Unmitigated (Foundation Installation)	9.0	38.7	60.9	41.1	1.2	5.1	8.0	5.4
OPTIC FIBER AND ELECTRICAL LINE INSTALLATION								
Total Unmitigated (Fiber and Line Installation)	10.1	42.4	57.8	40.9	1.3	5.6	7.6	5.4
ROAD IMPROVEMENTS								
Total Unmitigated (Road Improvement)	12.0	62.0	68.0	42.0	0.8	3.6	4.7	4.6
Maximum Emissions Unmitigated All Activities	42.0	188.1	245.3	164.7	4.7	20.2	28.0	20.8

[1] Based on emission factors contained in the Road Construction Emission Model, Version 5.2 (SMAQMD 2006), general information provided in the project description, and default model settings and parameters. Total emissions include heavy-duty on-site equipment, material transport, and worker commute exhaust emissions; and ground disturbance.

Refer to Air Quality Appendix for all input assumptions and modeling results.

Source: Data modeled by EDAW in 2007.

In addition, the following standard dust control measures would be implemented by SFPUC during construction:

- Erosion and sedimentation controls tailored to the site and project;
- Preparation of a dust control plan;
- Preservation of existing vegetation;
- Use of wind erosion control (e.g., geotextile or plastic covers on stockpiled soil);
- Sweeping of nearby streets at least once per day; and/or stabilization of site ingress/egress locations; and,
- Spraying the disturbed areas of the site, or any stockpiled soil, with water to minimize fugitive dust emissions.

Construction-related activities would also result in short-term project-generated emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment. Diesel PM was identified as a toxic air contaminant (TAC) by CARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential non-cancer health impacts (CARB 2003). At this time,

SJVAPCD has not adopted a methodology for analyzing such impacts and does not recommend the completion of health risk assessments for construction-related emissions of TACs (Reed, pers. comm., 2007).

It is important to note that construction equipment emissions would be reduced over the period of project development. In January 2001, the EPA promulgated a Final Rule to reduce emission standards for 2007 and subsequent model year heavy-duty diesel engines. These emission standards represent a 90% reduction in NO_X, 72% reduction of nonmethane hydrocarbon emissions, and 90% reduction of PM emissions in comparison to the 2004 model year emission standards.

More specifically, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project (e.g., approximately 18 months, or roughly 2% of the exposure period for the entire project) (Salinas, pers. comm., 2004). Thus, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002) project-generated, construction-related emissions of TACs would not expose sensitive receptors to substantial concentrations of TACs. It is important to note that there are many rural residences dispersed throughout the area where construction activities would occur; however, due to the reasons listed above, none would be exposed to harmful levels of TAC emissions.

In summary, worst-case construction-generated emissions would not exceed the SJVAPCD's applicable threshold of 10 tpy. Therefore, construction of the project would not be anticipated to violate an air quality standard, or contribute substantially to an existing or projected air quality violation. Finally, due to the reasons explained above, construction activities would not expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered less than significant under CEQA, and local, short-term, minor, and adverse under NEPA.

Impact Determination (Oakdale Area)**:**

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	Local	Short-Term	Minor	Adverse	LS
Moccasin Powerhouse	MPH	Local	Short-Term	Minor	Adverse	LS
Moccasin Powerhouse Passive Reflector	MPR	Local	Short-Term	Minor	Adverse	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Dam Diversion Tunnel	ODT	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Stream Gauge	OSG	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Water Quality Building	OWQ	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Chalet (Cottage 1)	OC1	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Bunkhouse	OBH	Local	Short-Term	Minor	Adverse	LS
O'Shaughnessy Water Tanks	OWT	Local	Short-Term	Minor	Adverse	LS
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local	Short-Term	Minor	Adverse	LS
Lake Eleanor-Cherry Lake Tunnel	ECT	Local	Short-Term	Minor	Adverse	LS
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Short-Term	Minor	Adverse	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local	Short-Term	Minor	Adverse	LS
Cherry Pump Station	CPS	Local	Short-Term	Minor	Adverse	LS
Cherry Water Tanks	CWT	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Garage and Warehouse	CGW	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Camphouse	CCH	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Cottage #1	CC1	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Cottage #2	CC2	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Cottage #3	CC3	Local	Short-Term	Minor	Adverse	LS
Cherry Lake Cottage #4	CC4	Local	Short-Term	Minor	Adverse	LS
Cherry Tower Site	CTS	Local	Short-Term	Minor	Adverse	LS
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Minor	Adverse	LS
Intake Switchyard	ISY	Local	Short-Term	Minor	Adverse	LS
Kirkwood Powerhouse	KPH	Local	Short-Term	Minor	Adverse	LS
Holm Powerhouse	HPH	Local	Short-Term	Minor	Adverse	LS
Duckwall Mountain						
Duckwall Mountain	DWM	Local	Short-Term	Minor	Adverse	LS
Jones Point						
Jones Point	JPT	Local	Short-Term	Minor	Adverse	LS
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Minor	Adverse	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Moccasin, Yosemite National Park, Stanislaus National Forest Area Sites

The Moccasin, Yosemite National Park, Stanislaus National Forest Area sites are located in Tuolumne County, which is under the jurisdiction of the TCAPCD. As described in the project description, construction activities at the various sites in the Moccasin, Yosemite National Park, Stanislaus National Forest Areas associated would include site preparation; installation of concrete foundations, optic cable, and underground electrical distribution lines; and road improvements (i.e., access road at BOR). Construction-related activities would result in project-generated emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG and NO_X) from heavy-duty on-site equipment, material transport, and worker commute exhaust emissions; and ground disturbance. Exact project-specific data (e.g., construction equipment types and number requirements, and maximum daily acreage disturbed) were not available at the time of this analysis, but on-site equipment for site preparation activities would likely include excavators, front-end loaders, graders, compactors, backhoes, and trenchers for site preparation. For installation of concrete foundations, equipment would include backhoes, excavators, compactors, concrete trucks, cranes, and augers. For installation of optic cable and underground electrical distribution lines, equipment would include cranes, bucket trucks, stationary reel trucks/trailers, winch trucks/trailers, cable support equipment (i.e., cable chutes and blocks), trenchers, backhoes, and compacters. For road improvements, equipment would include graders, dozers, backhoes, scrapers, compactors, and haul trucks. Construction at these sites would occur within the 18 months for the overall project construction.

Worst-case project-generated, construction-related emissions of regional criteria air pollutants and precursors were modeled in accordance with TCAPCD-recommended methodologies based on general information provided in the project description and default model settings and parameters.

Table 3.8.6-1 summarizes the modeled project-generated, construction-related emissions of criteria air pollutants and precursors from each type of construction activity. Construction-related air quality effects were determined by comparing these modeling results with applicable TCAPCD significance thresholds. As shown Table 3.8.6-1, all types of activities occurring simultaneously would result in total unmitigated emissions of approximately 42 lb/day (5 tpy) of ROG, 188 lb/day (20 tpy) of CO, 245 lb/day (28 tpy) of NO_X, and 165 lb/day (21 tpy) of PM_{10}, which would not exceed TCAPCD's significance thresholds of 1,000 lb/day (100 tpy) for ROG, CO, NOx, and PM_{10}.

Construction-related activities would also result in short-term project-generated emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment. For the same reasons as discussed above for the Oakdale Area, project-generated, construction-related emissions of TACs would not expose sensitive receptors, which are widely dispersed throughout the project area, to substantial emissions of TACs.

Thus, construction-related emissions would not be anticipated to violate an air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered less than significant under CEQA, and local, short-term, minor, and adverse under NEPA.

Impact Determination (Moccasin, Yosemite National Park, Stanislaus National Forest Area Sites)

CEQA: Less than significant.

NEPA: Local, short-term, minor, adverse impact.

Project-Generated, Operation-Related Stationary and Mobile Source Air Pollutant Emissions.

Oakdale Area						
		NEPA				**CEQA**
Site		**Context**	**Duration**	**Intensity**	**Type**	**Impact**
Warnerville Switchyard	WSY	Local/Regional	Long-Term	Negligible	Adverse	LS
Moccasin Area						
		NEPA				**CEQA**
Site		**Context**	**Duration**	**Intensity**	**Type**	**Impact**
Moccasin Peak	MPK	Local/Regional	Long-Term	Negligible	Adverse	LS
Moccasin Powerhouse	MPH	Local/Regional	Long-Term	Negligible	Adverse	LS
Moccasin Powerhouse Passive Reflector	MPR	Local/Regional	Long-Term	Negligible	Adverse	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local/Regional	Long-Term	Negligible	Adverse	LS
O'Shaughnessy Dam Diversion Tunnel	ODT	Local/Regional	Long-Term	Negligible	Adverse	LS
O'Shaughnessy Stream Gauge	OSG	Local/Regional	Long-Term	Negligible	Adverse	LS
O'Shaughnessy Water Quality Building	OWQ	Local/Regional	Long-Term	Negligible	Adverse	LS
O'Shaughnessy Chalet (Cottage 1)	OC1	Local/Regional	Long-Term	Negligible	Adverse	LS
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local/Regional	Long-Term	Negligible	Adverse	LS
O'Shaughnessy Bunkhouse	OBH	Local/Regional	Long-Term	Negligible	Adverse	LS
O'Shaughnessy Water Tanks	OWT	Local/Regional	Long-Term	Negligible	Adverse	LS
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local/Regional	Long-Term	Negligible	Adverse	LS
Lake Eleanor-Cherry Lake Tunnel	ECT	Local/Regional	Long-Term	Negligible	Adverse	LS
Poopenaut Pass						
Poopenaut Pass	PPP	Local/Regional	Long-Term	Negligible	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Pump Station	CPS	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Water Tanks	CWT	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Lake Garage and Warehouse	CGW	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Lake Camphouse	CCH	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Lake Cottage #1	CC1	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Lake Cottage #2	CC2	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Lake Cottage #3	CC3	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Lake Cottage #4	CC4	Local/Regional	Long-Term	Negligible	Adverse	LS
Cherry Tower Site	CTS	Local/Regional	Long-Term	Negligible	Adverse	LS
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local/Regional	Long-Term	Negligible	Adverse	LS
Intake Switchyard	ISY	Local/Regional	Long-Term	Negligible	Adverse	LS
Kirkwood Powerhouse	KPH	Local/Regional	Long-Term	Negligible	Adverse	LS
Holm Powerhouse	HPH	Local/Regional	Long-Term	Negligible	Adverse	LS
Duckwall Mountain						
Duckwall Mountain	DWM	Local/Regional	Long-Term	Negligible	Adverse	LS
Jones Point						
Jones Point	JPT	Local/Regional	Long-Term	Negligible	Adverse	LS
Burnout Ridge						
Burnout Ridge	BOR	Local/Regional	Long-Term	Negligible	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Oakdale, Moccasin, Yosemite National Park, and Stanislaus National Forest Area Sites

With respect to mobile sources, long-term operations at the Oakdale, Moccasin, Yosemite National Park, and Stanislaus National Forest Area sites would only generate vehicle trips from routine maintenance, as no additional staff would be required. Routine maintenance trips would result in a negligible contribution of mobile source emissions (i.e., 0.1 lb/day or less of ROG, NO_X, and PM_{10}; and 1 lb/day of CO). Thus, operation of the proposed project would not result in a significant increase in long-term regional ROG, NO_X, and PM_{10} or local CO emissions associated with increases in mobile sources. Because implementation of the proposed project would not result in a significant increase in vehicle miles traveled, it would not conflict with or obstruct implementation of the air planning effort of TCAPCD and SJVAPCD air planning efforts.

Construction of the proposed project would not result in the operation of any major stationary emission sources; however, the long-term operation of the Moccasin Peak, Intake Radio Site, Cherry Tower Site, and Burnout Ridge sites would include the use of an emergency backup generator. However, the proposed emergency generators at Moccasin Peak and Intake Radio Site would replace those that currently exist on the sites and, with respect to the Cherry Tower Site and Burnout Ridge, there are no sensitive receptors within the vicinity and the generators would be self-contained. Nonetheless, stationary sources of air-pollutant emissions that comply with applicable regulations pertaining to best available control technology (BACT) and offset requirements are not considered to have significant air quality impacts. In fact, such emissions are not typically included in CEQA/NEPA analyses unless the operation of a stationary source results in surplus emissions in excess of BACT and offsets. Stationary sources proposed as part of this project would be subject to permitting and BACT requirements for both criteria air pollutant and precursor emissions, and toxic air contaminant emissions.

Thus, long-term operational emissions would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, conflict with air quality plans, or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered less than significant under CEQA, and local, long-term, negligible, and adverse under NEPA.

Impact Determination (Oakdale, Moccasin, Yosemite National Park, Stanislaus National Forest Areas)**:**

CEQA: Less than significant.

NEPA: Local and regional, long-term, negligible, adverse impact.

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Alternative 3 is the same as Alternative 2, the Preferred Alternative, except that the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the Poopenaut Pass site identified for Alternative 2. Potential short-term and long-term air quality impacts would be the same as those described for the Alternative 2. The same facilities would be constructed and installed, but at a different location for the Poopenaut Pass site. Compliance with applicable regulations would reduce short-term effects to air quality.

3.8.6.4 Mitigation Measures

None required.

3.8.6.5 Impairment

Impacts to air quality associated with all alternatives are expected to be local, short-term, negligible, and beneficial. Therefore, air quality would not be impaired for future generations.

3.8.6.6 Cumulative Impacts

Cumulative effects on air quality are based on analysis of projects in the Hetch Hetchy Communication System Upgrade project area. There are no identifiable projects that would contribute to adverse air quality impacts. Other projects within the project area would be subject to implement project-specific mitigation measures, and comply with applicable regulations. Therefore, cumulative air quality impacts would not be significant or adverse.

3.8.6.7 Conclusion Statement

Impacts on air quality are summarized below:

Project-Generated, Construction-Related Air Pollutant Emissions.

Oakdale Area**:**

CEQA: Less than significant

NEPA: Local, short-term, minor, adverse impact

All Moccasin Sites, O'Shaughnessy Sites, Lake Eleanor Sites, Poopenaut Pass, Cherry Lake Sites, Early Intake & Tuolumne River Area, Duckwall Mountain, Jones Point, and Burnout Ridge.

CEQA: Less than significant

NEPA: Local, short-term, minor, adverse

Project-Generated, Operation-Related Stationary and Mobile Source Air Pollutant Emissions

Oakdale area, all Moccasin Sites, O'Shaughnessy Sites, Lake Eleanor Sites, Poopenaut Pass, Cherry Lake Sites, Early Intake & Tuolumne River Area, Duckwall Mountain, Jones Point and Burnout Ridge.

CEQA: Less than significant

NEPA: Local and regional, long-term, negligible, adverse

3.8.7 Noise

This section describes the existing noise setting of the Hetch Hetchy Communication System Upgrade project site areas. This section includes a description of acoustic fundamentals and existing noise conditions in the vicinity of the proposed project sites, as well as the regulatory setting for the analysis of noise (and vibration) effects.

3.8.7.1 Affected Environment

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration, and as any pressure variation in air that the human ear can detect.

Sound Properties

A sound wave is introduced into a medium (air) by a vibrating object. The vibrating object (e.g., vocal cords, the string and sound board of a guitar, or the diaphragm of a radio speaker) is the source of the disturbance that moves through the medium. Regardless of the type of source creating the sound wave, the particles of the medium through which the sound moves are vibrating in a back-and-forth motion at a given frequency (pitch). The frequency of a wave refers to how often the particles vibrate when a wave passes through the medium. The frequency of a wave is measured as the number of complete back-and-forth vibrations of a particle per unit of time. If a particle of air undergoes 1,000 longitudinal vibrations in 2 seconds, then the frequency of the wave would be 500 vibrations per second. A commonly used unit for frequency is cycles per second, called hertz (Hz).

Each particle vibrates as a result of the motion of its nearest neighbor. For example, the first particle of the medium begins vibrating at 500 Hz and sets the second particle of the medium into motion at the same frequency (500 Hz). The second particle begins vibrating at 500 Hz and thus sets the third particle into motion at 500 Hz. The process continues throughout the medium; hence each particle vibrates at the same frequency, which is the frequency of the original source. Subsequently, a guitar string vibrating at 500 Hz will set the air particles in the room vibrating at the same frequency (500 Hz), which carries a sound signal to the ear of a listener that is detected as a 500 Hz sound wave.

The back-and-forth vibration motion of the particles of the medium would not be the only observable phenomenon occurring at a given frequency. Because a sound wave is a pressure wave, a detector could be used to detect oscillations in pressure from high to low and back to high pressure. As the compression (high-pressure) and rarefaction (low-pressure) disturbances move through the medium, they would reach the detector at a given frequency. For example, a compression would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Similarly, a rarefaction would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Thus, the frequency of a sound wave refers not only to the number of back-and-forth vibrations of the particles per unit of time but also to the number of compression or rarefaction disturbances that pass a given point per unit of time. A detector could be used to detect the frequency of these pressure oscillations over a given period of time. The period of the

sound wave can be found by measuring the time between successive high-pressure points (corresponding to the compressions) or the time between successive low-pressure points (corresponding to the rarefactions). The frequency is simply the reciprocal of the period; thus an inverse relationship exists so that as frequency increases, the period decreases, and vice versa.

A wave is an energy transport phenomenon that transports energy along a medium. The amount of energy carried by a wave is related to the amplitude (loudness) of the wave. A high-energy wave is characterized by high amplitude; a low-energy wave is characterized by low amplitude. The amplitude of a wave refers to the maximum amount of displacement of a particle from its rest position. The energy transported by a wave is directly proportional to the square of the amplitude of the wave. This means that a doubling of the amplitude of a wave is indicative of a quadrupling of the energy transported by the wave.

Sound and the Human Ear

Because of the ability of the human ear to detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB) to avoid a very large and awkward range in numbers. The sound-pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure squared. The reference sound pressure is considered the absolute hearing threshold (Caltrans 1998). Use of this logarithmic scale reveals that the total sound from two individual 65-dBA sources is 68 dBA, not 130 dBA (i.e., doubling the source strength increases the sound pressure by 3 dBA).

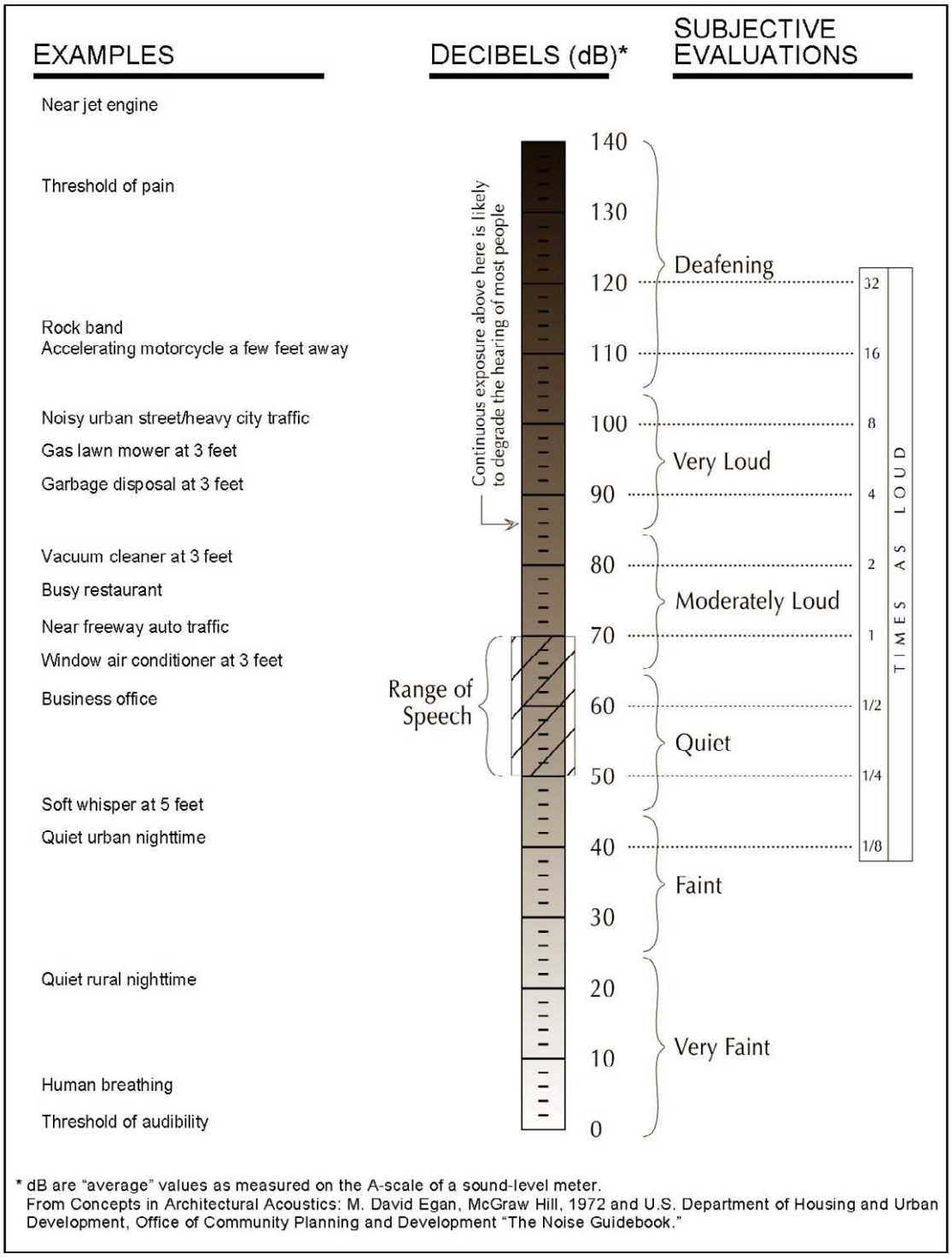
Because the human ear is not equally sensitive to all sound frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. A dBA scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale has been chosen by most authorities for the purpose of regulating environmental noise. Typical indoor and outdoor noise levels are presented in Figure 3.8.7-1.

With respect to how humans perceive and react to changes in noise levels, a 1-dBA increase is imperceptible, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly noticeable, and a 10-dBA increase is subjectively perceived as approximately twice as loud (Egan 1988), as presented in Table 3.8.7-1. Table 3.8.7-1 was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50–70 dBA, as this is the usual range of voice and interior noise levels.

Sound Propagation and Attenuation

As sound (noise) propagates from the source to the receptor, the attenuation, or manner of noise reduction in relation to distance, is dependent on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse-square law describes the attenuation caused by the pattern in which sound travels from the source to receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dBA per doubling of distance (dBA/DD). However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate

Figure 3.8.7-1 Typical Noise Levels



Source: Data compiled by EDAW in 2007

of 3 dBA/DD. The surface characteristics between the source and the receptor may result in additional sound absorption and/or reflection. Atmospheric conditions such as wind speed, temperature, and humidity may affect noise levels. Furthermore, the presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation is dependent upon the size of the barrier and the frequency of the noise. A noise barrier may be any natural or human-made feature such as a hill, tree, building, wall, or berm (Caltrans 1998).

Table 3.8.7-1
Subjective Reaction to Changes in Noise Levels of Similar Sources

Change in Level, dBA	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (Except for Tones)	1.3
3	Just Barely Perceptible	2.0
6	Clearly Noticeable	4.0
10	About Twice (or Half) as Loud	10.0
Note: dBA = A-weighted decibels Source: Egan 1988		

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dBA with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30–40 dBA with its windows closed (Paul S. Veneklasen & Associates 1973, cited in Caltrans 2004).\

Noise Descriptors

The selection of a proper noise descriptor for a specific source is dependent upon the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (Caltrans 1998, Lipscomb and Taylor 1978):

- L_{max} (Maximum Noise Level): The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the "peak (noise) level."
- L_{min} (Minimum Noise Level): The minimum instantaneous noise level during a specific period of time.
- L_X (Statistical Descriptor): The noise level exceeded X% of a specific period of time.
- L_{eq} (Equivalent Noise Level): The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high work levels.

- L_{dn} (Day-Night Noise Level): The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The Ldn attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- CNEL (Community Noise Equivalent Level): The CNEL is similar to the Ldn described above, but with an additional 5 dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7:00 p.m. to 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the Ldn.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level Leq, which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually 1 hour). The Leq is the foundation of the composite noise descriptors such as Ldn and CNEL, as defined above, and correlates well with community response to noise.

Negative Effects of Noise on Humans

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Both gradual and traumatic hearing loss may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency bandwidth, and level of the noise, as well as the exposure time (Caltrans 1998).

Vibration

Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure borne noise. Sources of groundborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS), as in RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (FTA 2006, Caltrans 2004).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006). This is based on a reference value of 1 micro (μ) in/sec.

The background vibration-velocity level in residential areas is usually approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006).

Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate groundborne vibrations, which can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2006).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, horizontal directional drilling, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Table 3.8.7-2 describes the general human response to different levels of groundborne vibration-velocity levels.

Table 3.8.7-2
Human Response to Groundborne Vibration Levels

Vibration Velocity (VdB)	Human Response
65	Approximate threshold of perception for many humans
75	Approximate dividing line between barely perceptible and distinctly perceptible
85	Vibration acceptable only if there are an infrequent number of events per day
VdB = vibration decibels Source: FTA 2006	

Existing Noise Conditions -Sensitive Receptors and Noise Sources

Oakdale Area Site (Warnerville Switchyard)

Existing nearby noise-sensitive receptors include single-family residential dwellings located along Warnerville Road, near the entrance to the Warnerville Switchyard site.

The existing noise sources in the vicinity of the Oakdale area site include surface transportation noise emanating from vehicle traffic on area roadways (e.g., Warnerville Road) and agricultural equipment.

Noise from other outdoor activities (e.g., people talking, dogs barking, and operation of landscaping) also contribute, to a lesser extent, to the existing noise environment.

Moccasin Area Sites

Existing noise-sensitive receptors in the Moccasin area include single-family residential dwellings located in the town of Moccasin near the Moccasin Powerhouse site. The Moccasin Peak and Moccasin Powerhouse Passive Reflector sites are located in rural areas. The existing noise sources in the vicinity of the Moccasin area sites include surface transportation noise emanating from vehicle traffic on area roadways (e.g., Highways 120 and 49), specifically the Moccasin Powerhouse site. Noise from surrounding outdoor activities (e.g., people talking, dogs barking, operation of landscaping equipment, wildlife, and recreational activities) also contribute, to a lesser extent, to the existing noise environment.

Sierra Nevada Sites (Stanislaus National Forest and Yosemite National Park area)

The Sierra Nevada sites are located in remote areas and consequently, there are no existing noise-sensitive receptors located within the vicinity of these sites. Surface transportation noise emanating from vehicle traffic on area roadways (e.g., access roads) and noise from surrounding outdoor activities (e.g., people talking, dogs barking, operation of landscaping and agricultural equipment, wildlife, and recreational activities) comprise the existing noise environment. At the Intake Switchyard, Holm Powerhouse, and Kirkland Powerhouse sites, the sound of water movement associated with the Tuolumne River located nearby also contributes to the existing noise environment. The sound of water movement associated with the Tuolumne River and dam operations also contributes to the existing noise environment at the O'Shaughnessy Dam sites.

Federal Plans, Policies, Regulations, and Laws

US Department of the Interior

The National Park Service protects and manages soundscapes through the following policies, regulations, and laws, which form the foundation of the Natural Sounds Program.

- Organic Act. The Organic Act establishes and authorizes the National Park Service "to conserve the scenery and the national and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."
- Redwoods Act. The Redwoods Act of 1978, affirms and clarifies the National Park Service mission and authority. It states: "The authorization of activities shall be construed, and the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established."
- Management Policies. National Park Service Management Policies are an indispensable tool to help National Park Service employees manage parks responsibly and make rational, well-informed decisions. Concerned citizens may also refer to these policies to better understand how the Service will meet its park management responsibilities under the 1916 National Park Service Organic Act. Section 4.9 addresses the National Park Service commitment to protect natural soundscapes. The portions of Management Policies that are most pertinent to this topic are: Chapter 1, Introduction; Chapter 4, Natural Resource Management; Chapter 5, Cultural Resource

Management; Chapter 6, Wilderness Preservation and Management; and Chapter 8, Use of the Parks.

- National Parks Overflights Act. In 1987, Congress enacted Public Law 100-91, commonly known as the National Parks Overflights Act. The Act mandated a number of studies related to the effects of overflights on parks and directed the National Park Service to report to Congress its results. In July, 1995, the NPS submitted its Published Report to Congress on Effects of Aircraft Overflights on the National Park System.
- National Park Air Tour Management Act. The National Park Air Tour Management Act was signed into law on April 5, 2000. The Act requires the Federal Aviation Administration, in cooperation with the National Park Service, to develop an Air Tour Management Plan for each unit of the National Park Service to provide acceptable and effective measures to mitigate or prevent the significant adverse impacts, if any, of commercial air tour operations upon natural and cultural resources and visitor experiences. The plans must also cover tribal lands that are within or abutting a unit of the National Park Service, or any area within ½ mile outside of a park.

US Department of Transportation

To address the human response to groundborne vibration, the US Department of Transportation, Federal Transit Administration (FTA) has also set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These include 65 VdB referenced to 1 μin/sec and based on the RMS velocity amplitude for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities); 80 VdB for residential uses and buildings where people normally sleep; and 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices) (FTA 2006).

Standards have also been established to address the potential for groundborne vibration to cause structural damage to buildings. These standards were developed by the Committee of Hearing, Bio Acoustics, and Bio Mechanics (CHABA) at the request of EPA (FTA 2006). For fragile structures, CHABA recommends a maximum limit of 0.25 in/sec PPV (FTA 2006).

State Plans, Policies, Regulations, and Laws

Governor's Office of Planning and Research

The State of California, Governor's Office of Planning and Research (OPR), published the State of California General Plan Guidelines (OPR 2003), which provides guidance for the acceptability of projects within specific day-night average noise level (Ldn) contours. Table 3.8.7-3 summarizes acceptable and unacceptable community noise exposure limits for various land use categories. Generally, residential uses (e.g., mobile homes) are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA Ldn. Residential uses are normally unacceptable in areas exceeding 70 dBA Ldn and conditionally acceptable within 55–70 dBA Ldn. Schools are normally acceptable in areas up to 70 dBA Ldn and normally unacceptable in areas exceeding 70 dBA Ldn. Commercial uses are normally acceptable in areas up to 70 dBA CNEL. Between 67.5 and 77.5 dBA Ldn, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Table 3.8.7-3
Summary of Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (dBA L_{dn})			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential—Low-Density Single-Family, Duplex, Mobile Home	<60	55–70	70–75	75+
Residential—Multifamily	<65	60–70	70–75	75+
Transient Lodging—Motel, Hotel	<65	60–70	70–80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	<70	60–70	70–80	80+
Auditoriums, Concert Halls, Amphitheaters		<70	65+	
Sports Arena, Outdoor Spectator Sports		<75	70+	
Playgrounds, Neighborhood Parks	<70		67.5–75	72.5+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	<75		70–80	80+
Office Building, Business Commercial, and Professional	<70	67.5–77.5	75+	
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	

Notes: dBA = A-weighted decibels; L_{dn} = day-night average noise level
1 Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
2 New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.
3 New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.
4 New construction or development should generally not be undertaken.
Source: OPR 2003

California Department of Transportation

For the protection of fragile, historic, and residential structures, the California Department of Transportation (Caltrans) recommends a more conservative threshold of 0.2 in/sec PPV for normal residential buildings and 0.08 in/sec PPV for old or historically significant structures (Caltrans 2004). These standards are more stringent than the federal standard established by CHABA, presented above.

Local Plans, Policies, Regulations, and Laws

Stanislaus County General Plan

The Stanislaus County General Plan Noise Element sets forth goals, policies, and implementation measures to protect residences and other noise sensitive land uses. The County of Stanislaus General Plan contains the following standards for stationary sources of noise (Refer to Tables 3.8.7-4 and 3.8.7-5):

Table 3.8.7-4
Stanislaus County General Plan Noise Level Performance Standards Shown (dBA)

Category	Cumulative number of minutes in any one-hour time period	Exterior Standard[1]	
		Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65

[1] Each of the noise level standards specified in this table shall be reduced by five (5) dBA for pure tone noises, noise consisting primarily of speech or music, or for recurring impulsive noises. The standards in this table should be applied at a residential or other noise-sensitive land use and not on the property of a noise-generating land use.
Source: Stanislaus County General Plan 1994

Table 3.8.7-5
Stanislaus County General Plan Maximum Allowable Noise Exposure – Stationary Sources[1] (dBA)

	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
Hourly L_{eq}	50	45
L_{max}	70	65

[1] As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.
Source: Stanislaus County General Plan 1994

Tuolumne County General Plan

The Noise Element of the Tuolumne County General Plan (1996) includes goals, policies, and implementation programs designed to ensure that County residents are not subjected to noise beyond acceptable levels. One of the objectives of the General Plan is to protect existing noise-sensitive development (e.g., hospitals, schools, churches and residential uses) from new uses that would generate noise levels incompatible with those uses and, conversely, discourage noise-sensitive uses from locating near sources of high noise levels. The General Plan contains noise performance standards for noise sensitive land uses (e.g., residences, schools, hospitals) affected by non-transportation sources (Refer to Table 3.8.7-6) and significance standards for cumulative increases in ambient noise levels (Refer to Table 3.8.7-7).

Table 3.8.7-6
Maximum Allowable Noise Exposure Stationary Noise Sources

Noise Level Descriptor	Daytime (7 am to 10 pm)	Nighttime (10 pm to 7 am)
Hourly L_{eq}, dB	50	45
Maximum level, dB	70	65
Source: Tuolumne County 1996		

Table 3.8.7-7
Significance Standards for Cumulative Increases in Ambient Noise Levels

Ambient Noise Level Without Project (dBA CNEL/L_{dn})	Significant Impact if Ambient Level Increases by:
Less than 60	5 dBA, or more
60 to 65	3 dBA, or more
Greater than 65	1.5 dBA, or more
Source: Tuolumne County 1996	

3.8.7.2 Thresholds of Significance

CEQA Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to noise, but considers that implementation of the proposed project would have a significant impact if it were to:

- Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport would the project expose people residing or working in the area to excessive noise levels;
- For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels; or
- Be substantially affected by existing noise levels.

NEPA Thresholds (National Park Service/US Forest Service Sites)

Context of Impact

For the purposes of this assessment, the context of the impact considers whether the impact would be local or regional. Localized noise impacts are those that occur within or immediately adjacent to the project site. Regional impacts refer to those occurring in off-site location.

Type of Impact

The type of impact refers to whether the effect is considered beneficial or adverse. Beneficial noise impacts would be created through a reduction in decibels, and adverse impacts would be created through an increase in decibels.

Duration of Impact

Short-term impacts would be impacts created through the construction phase of the alternative action. Long-term impacts would be impacts created through permanent changes to sound levels, and which are expected to prevail following implementation of the alternative action.

Intensity of Impact

The intensity of an impact considers whether the impact is judged negligible, minor, moderate, or major relative to baseline conditions (No Action Alternative). For this analysis, noise impacts are based on the degree of predicted change in sound levels from the No Action Alternative.

Negligible impacts would not be perceivable (i.e., less than 3 dBA). Minor impacts would be slightly noticeable (i.e., 3 to 5 dBA) in close proximity to the source, but are not expected to have an appreciable effect on ambient noise levels. Moderate impacts would be clearly detectable (i.e., 6 to 9 dBA) and could have an appreciable effect on ambient noise levels; moderate adverse impacts may include introduction of noise associated with an activity or facility into an area with little or no ambient noise. Major impacts would be clearly audible (i.e., greater than 9 dBA) against ambient noise levels; or would have a substantial, highly noticeable effect on ambient noise levels.

For construction-related noise impacts, an increase of 3 dBA or more at nearby noise-sensitive land uses during the evening and nighttime periods of the day (i.e., 7 pm to 7 am) would be considered a moderate impact.

Long-term stationary source noise impacts would be moderate if the proposed project would result in noise levels that exceed the typical noise standards at nearby noise-sensitive land uses.

Long-term traffic noise impacts would be considered moderate if implementation of the proposed project would result in a noticeable increase (i.e., 3 dBA or greater) in existing traffic noise levels.

3.8.7.3 Environmental Consequences

Environmental Consequences of Alternative 1 (No Action)

The No Action Alternative maintains the status quo at all communication facility sites. This alternative provides a basis to compare the action alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Under this alternative, all communication sites would remain in their current state. No impacts would be associated with this alternative.

Environmental Consequences of Alternative 2 (Preferred Alternative)

Impacts associated with the project are evaluated based on their context, duration, intensity and type. The following tables and discussion provide information regarding the nature of impacts from the proposed project as they relate to noise (and vibration). Because the project would not affect any existing sensitive receptors, involve any new sensitive receptors at or near the project sites, or located in the vicinity of a private airstrip, there would be no impacts associated with exposing people residing or working in the area to excessive noise levels. Thus, these issues are not discussed further.

With the exception of the Warnerville Switchyard site, none of the project sites are located within two miles of a public airport. However, this project would not result in new residents or additional employees at Warnerville Switchyard. Short-term construction related impacts at Warnerville Switchyard would occur (and are discussed for all sites below); however, upgrades at this site would not result in exposing residents or employees to excessive noise levels. Thus, this issue is not discussed further.

Project-Generated, Construction-Related Noise Levels

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	Local	Short-Term	Moderate	Adverse	LSM

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	Local	Short-Term	Moderate	Adverse	LSM
Moccasin Powerhouse	MPH	Local	Short-Term	Moderate	Adverse	LSM
Moccasin Powerhouse Passive Reflector	MPR	Local	Short-Term	Moderate	Adverse	LSM

CEQA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Oakdale and Moccasin Area Sites

Implementation of proposed communication facility upgrades at the Oakdale and Moccasin Area sites would take place within existing developed areas. Preparation of the communication tower foundations at Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse would require the removal of

existing asphalt paving where the new tower would be located, followed by the construction of the new tower foundation. New construction would not occur at Moccasin Powerhouse Passive Reflector, but would involve the removal of the passive reflector. The construction equipment required for the activities mentioned above is not known at this time, but would likely include backhoes, excavators, compactors, concrete trucks, cranes, and augers. According to the EPA, individual equipment noise levels for these types of equipment can range from 83 to 91 dBA at 50 feet without feasible noise control, as shown in Table 3.8.7-8. The simultaneous operation of heavy-duty construction equipment could result in combined intermittent noise levels of approximately 93 dBA at 50 feet from the project sites. Based on these noise levels and a typical noise-attenuation rate of 6.0 dBA/DD, exterior noise levels at noise-sensitive receptors (e.g., residences along Warnerville Road and in the town of Moccasin) located within 2,750 and 4,350 feet from the construction activity could exceed 50 and 45 dBA, respectively, without noise control.

Table 3.8.7-8
Typical Construction Equipment Noise Levels

Type of Equipment	Noise Level in dBA at 50 feet	
	Without Feasible Noise Control	With Feasible Noise Control[1]
Pile Driver	101	95
Drill	98	80
Dozer or Tractor	80	75
Excavator	88	80
Scraper	88	80
Front-end Loader	79	75
Backhoe	85	75
Grader	85	75
Crane	83	75
Truck	91	75
Compactor	81	75
Paver	89	80
Pump	76	75
Generator	78	75

[1] Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturers' specifications.

Sources: US Environmental Protection Agency 1971, Federal Transit Administration 2006

In most cases, the local noise ordinance contains standards for residential uses affected by construction source noise; however, Stanislaus and Tuolumne counties have not adopted noise ordinances. Nevertheless, if construction activities were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) or construction equipment not properly equipped with noise control

devices, construction-generated source noise could exceed the applicable standards at nearby existing noise-sensitive land uses. In addition, if construction activities were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning), construction-generated noise levels could result in annoyance and/or sleep disruption to occupants of the nearby existing noise-sensitive land uses and create a substantial temporary increase in ambient noise levels in the project vicinity. As a result, this impact is considered significant under CEQA, and local, short-term, moderate, and adverse under NEPA. Implementation of Mitigation Measure 1 – Noise, requiring all construction equipment to be properly maintained and equipped with noise controls in accordance with manufacturers' specifications; and Mitigation Measure 2 – Noise, limiting all construction activities to the hours of 7:00 a.m. to 7:00 p.m. Monday through Saturday, would reduce this impact to a less than significant level.

Impact Determination (Oakdale and Moccasin Areas)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, moderate, adverse impact.

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Dam Diversion Tunnel	ODT	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Stream Gauge	OSG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Quality Building	OWQ	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Chalet (Cottage 1)	OC1	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Bunkhouse	OBH	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Tanks	OWT	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor-Cherry Lake Tunnel	ECT	Local	Short-Term	Negligible	Adverse	NI
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Short-Term	Moderate	Adverse	LSM
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

Implementation of proposed communication facility upgrades at the O'Shaughnessy and Lake Eleanor Areas would take place within existing developed areas, with the exception of the upgrade at the O'Shaughnessy Stream Gauge. Project-related upgrades at these sites would consist of equipment installation and no ground disturbance would occur. The construction equipment for aforementioned activities would likely only require electrician's hand tools, which would not result in the generation of any noise levels. In addition, there are no noise-sensitive receptors located in the vicinity of these sites. As a result, there is no impact under CEQA, and local, short-term, negligible, and adverse under NEPA.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas)**:**

CEQA: No impact.

NEPA: Local, short-term, negligible, adverse impact.

Poopenaut Pass

Project-related upgrades at Poopenaut Pass would include the installment of a new communication tower and shelter. The construction equipment required for the activities mentioned above is not known at this time, but would likely include backhoes, excavators, compactors, concrete trucks, augers, and rock-breaking equipment (i.e., jackhammers and drills). According to the EPA, individual equipment noise levels for these types of equipment can range from 85 to 98 dBA at 50 feet without feasible noise control, as shown in Table 3.8.7-8. The simultaneous operation of heavy-duty construction equipment could result in combined intermittent noise levels of approximately 99 dBA at 50 feet from the project sites. Based on these noise levels and a typical noise-attenuation rate of 6.0 dBA/DD, exterior noise within 4,600 feet and 7,300 feet from the construction activity could exceed 50 and 45 dBA, respectively, without noise control.

At this site, a helicopter would also be required to lift tower and shelter sections and blasting associated with preparation of the foundation. Helicopter and blasting activities could result in noise levels in excess of 100 dBA L_{max} depending on various characteristics, e.g., helicopter speed and operational mode, and blast design parameters (explosive type and amount, drill pattern, and time scheme). It should be noted that although these L_{max} levels would be fairly high, the duration and frequency of occurrence of these noise events are too short to contribute sufficiently to the overall average daily noise levels.

There are no noise-sensitive receptors located in the near vicinity of these sites. However, if construction activities, specifically the use of a helicopter and blasting, were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) or construction equipment not properly equipped with noise control devices, construction-generated noise levels could result in annoyance and/or sleep disruption to occupants of distant existing noise-sensitive land uses and create a substantial temporary increase in ambient noise levels in the project vicinity. As a result, this impact is considered significant under CEQA, and local, short-term, moderate, and adverse under NEPA. Implementation of Mitigation Measures 1 and 2 – Noise, would reduce this impact to a less than significant level.

Impact Determination (Poopenaut Pass Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, moderate, adverse impact.

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local	Short-Term	Moderate	Adverse	LSM
Cherry Pump Station	CPS	Local	Short-Term	Moderate	Adverse	LSM
Cherry Water Tanks	CWT	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Garage and Warehouse	CGW	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Camphouse	CCH	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #1	CC1	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #2	CC2	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #3	CC3	Local	Short-Term	Moderate	Adverse	LSM
Cherry Lake Cottage #4	CC4	Local	Short-Term	Moderate	Adverse	LSM
Cherry Tower Site	CTS	Local	Short-Term	Moderate	Adverse	LSM
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Moderate	Adverse	LSM
Intake Switchyard	ISY	Local	Short-Term	Moderate	Adverse	LSM
Kirkwood Powerhouse	KPH	Local	Short-Term	Moderate	Adverse	LSM
Holm Powerhouse	HPH	Local	Short-Term	Moderate	Adverse	LSM
Duckwall Mountain						
Duckwall Mountain	DWM	Local	Short-Term	Moderate	Adverse	LSM
Jones Point						
Jones Point	JPT	Local	Short-Term	Moderate	Adverse	LSM
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Moderate	Adverse	LSM

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

Project-related upgrades at existing sites in Cherry Lake (not including Cherry Tower Site) would include the installment of Yagi antennae and fiber optic cable. The construction equipment required for the activities mentioned above is not known at this time, but would likely include cranes, bucket trucks, stationary reel trucks/trailers, winch trucks/trailers, cable support equipment (i.e., cable chutes and blocks), trenchers, backhoes, and compacters. The simultaneous operation of heavy-duty construction equipment could result in combined intermittent noise levels of approximately 92 dBA at 50 feet from the project sites. Based on these noise levels and a typical noise-attenuation rate of 6.0 dBA/DD, exterior noise within 2,450 feet and 3,900 feet from the construction activity could exceed 50 and 45 dBA, respectively, without noise control.

Project-related upgrades at existing sites in the Early Intake & Tuolumne River area would include the installment of fiber optic cable at all sites, with the exception of Jones Point which would be abandoned, and a new communication tower and shelter at IRS. The construction equipment required for the activities mentioned above is not known at this time, but would likely include cranes, bucket trucks, stationary reel trucks/trailers, winch trucks/trailers, cable support equipment (i.e., cable chutes and blocks), trenchers, backhoes, and compacters along with excavators, concrete trucks, and augers for the preparation of foundation at Intake Radio Site. The simultaneous operation of heavy-duty construction equipment could

result in combined intermittent noise levels of approximately 93 dBA at 50 feet from the project sites. Based on these noise levels and a typical noise-attenuation rate of 6.0 dBA/DD, exterior noise levels within 2,750 feet and 4,350 feet from the construction activity could exceed 50 and 45 dBA, respectively, without noise control.

A helicopter may also be required for stringing operations, which could result in noise levels in excess of 100 dBA L_{max} depending on various characteristics (e.g., helicopter speed and operational mode). It should be noted that although these L_{max} levels would be fairly high, the duration and frequency of occurrence of these noise events are too short to contribute sufficiently to the overall average daily noise levels.

Project-related upgrades at the existing site in Duckwall Mountain, which would be abandoned, would include the removal of existing equipment and infrastructure. The construction equipment required for such removal would not include any additional equipment than those identified above for the other sites in the Stanislaus National Forest.

There are no noise-sensitive receptors located in the near vicinity of these sites. However, if construction activities, specifically the use of a helicopter, or construction equipment not properly equipped with noise control devices, were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) construction-generated noise levels could result in annoyance and/or sleep disruption to occupants of distant existing noise-sensitive land uses and create a substantial temporary increase in ambient noise levels in the project vicinity. As a result, this impact is considered significant under CEQA, and local, short-term, moderate, and adverse under NEPA. Implementation of Mitigation Measures 1 and 2 – Noise, would reduce this impact to a less than significant level.

Impact Determination (Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point areas)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, long-term, moderate, adverse impact.

New Sites in Cherry Lake and Burnout Ridge

Project-related upgrades at the new Cherry Tower site would include site preparation activities (e.g., clearing), and installation of a communication tower and shelter, emergency generator, propane tank, and related infrastructure (e.g., dishes, antennae, transformer). Project-related upgrades at the new Burnout Ridge site include site preparation activities (e.g., tree removal), roadway improvements, and installation of a communication tower and shelter, emergency generator, propane tank, and related infrastructure (e.g., dishes, antennae, transformer). The construction equipment required for the activities mentioned above is not known at this time, but would likely include backhoes, excavators, compactors, concrete trucks, cranes, and augers for installation of foundation and excavators; front-end loaders, graders, compactors, backhoes, and trenchers for site preparation.

The simultaneous operation of heavy-duty construction equipment could result in combined intermittent noise levels of approximately 93 dBA at 50 feet from the project sites. Based on these noise levels and a

typical noise-attenuation rate of 6.0 dBA/DD, exterior noise levels within 2,750 feet and 4,350 feet from the construction activity could exceed 50 and 45 dBA, respectively, without noise control.

There are no noise-sensitive receptors located in the near vicinity of these sites. However, if construction activities were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) or construction equipment not properly equipped with noise control devices, construction-generated noise levels could result in annoyance and/or sleep disruption to occupants of distant existing noise-sensitive land uses and create a substantial temporary increase in ambient noise levels in the project vicinity. As a result, this impact is considered significant under CEQA, and local, short-term, moderate, and adverse under NEPA. Implementation of Mitigation Measures 1 and 2 – Noise, would reduce this impact to a less than significant level.

Impact Determination (New Sites in Cherry Lake and Burnout Ridge)

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, moderate, adverse impact.

Project-Generated, Construction-Related Vibration Levels.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	Local	Short-Term	Negligible	Adverse	LS
Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse	MPH	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse Passive Reflector	MPR	Local	Short-Term	Negligible	Adverse	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local	Short-Term	Negligible	Adverse	LS
Cherry Pump Station	CPS	Local	Short-Term	Negligible	Adverse	LS
Cherry Water Tanks	CWT	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Garage and Warehouse	CGW	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Camphouse	CCH	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #1	CC1	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #2	CC2	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #3	CC3	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #4	CC4	Local	Short-Term	Negligible	Adverse	LS
Cherry Tower Site	CTS	Local	Short-Term	Negligible	Adverse	LS

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Negligible	Adverse	LS
Intake Switchyard	ISY	Local	Short-Term	Negligible	Adverse	LS
Kirkwood Powerhouse	KPH	Local	Short-Term	Negligible	Adverse	LS
Holm Powerhouse	HPH	Local	Short-Term	Negligible	Adverse	LS
Duckwall Mountain						
Duckwall Mountain	DWM	Local	Short-Term	Negligible	Adverse	LS
Jones Point						
Jones Point	JPT	Local	Short-Term	Negligible	Adverse	LS
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Negligible	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Oakdale, Moccasin, and Stanislaus National Forest Areas

Construction activities have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. Table 3.8.7-9 displays vibration levels for typical construction equipment.

As discussed above, the required construction equipment is not known at this time, but would likely include trucks, backhoes, excavators, compactors, cranes, and other miscellaneous types of construction equipment. According to Federal Transit Administration, vibration levels associated with the use of such equipment would be approximately 0.089 in/sec PPV and 87 VdB (referenced to 1 µin/sec and based on the RMS velocity amplitude) at 25 feet, as shown in Table 3.8.7-9. Using FTA's recommended procedure

Table 3.8.7-9
Typical Vibration Levels for Construction Equipment

Equipment		PPV at 25 feet (in/sec)[1]	Approximate L_v at 25 feet[2]
Pile Driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile Driver (sonic)	Upper range	0.734	105
	Typical	0.170	93
Large Bulldozer		0.089	87
Drill		0.089	87
Truck		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58
Significance Threshold		**0.2/0.08[3]**	**80**

[1] Where PPV is the peak particle velocity in inches per second.
[2] Where L_v is the velocity level in decibels (VdB) referenced to 1 microinch per second and based on the root mean square (RMS) velocity amplitude.
[3] For normal residential buildings and for buildings more susceptible to structural damage, respectively.
Sources: Caltrans 2004, FTA 2006

for applying a propagation adjustment to these reference levels, predicted worst-case vibration levels would exceed 0.2 in/sec PPV (Caltrans's recommended standard with respect to the prevention of structural damage for normal buildings) within 13 feet and 80 VdB (FTA's maximum-acceptable vibration standard with respect to human annoyance for residential uses) within 38 feet of vibration-sensitive receptors. There are no noise-sensitive receptors located within 38 feet of these sites. Thus, construction-generated activities would not result in the exposure of persons to or generation of excessive vibration levels. As a result, this impact is considered less than significant under CEQA, and local, short-term, negligible, and adverse under NEPA.

Impact Determination (Oakdale and Moccasin Areas**):**

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Dam Diversion Tunnel	ODT	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Stream Gauge	OSG	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Quality Building	OWQ	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Chalet (Cottage 1)	OC1	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Bunkhouse	OBH	Local	Short-Term	Negligible	Adverse	NI
O'Shaughnessy Water Tanks	OWT	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local	Short-Term	Negligible	Adverse	NI
Lake Eleanor-Cherry Lake Tunnel	ECT	Local	Short-Term	Negligible	Adverse	NI
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Short-Term	Negligible	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

As discussed above, the required construction equipment would likely only include electrician's hand tools, which would not result in the generation of any vibration levels. In addition, there are no noise-sensitive receptors located in the vicinity of these sites. As a result, there is no impact under CEQA, and local, short-term, negligible, and adverse under NEPA.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas**):**

CEQA: No impact.

NEPA: Local, short-term, negligible, adverse impact.

Poopenaut Pass

As discussed above, the required construction equipment is not known at this time, but would likely include trucks and rock-breaking equipment. According to the FTA, vibration levels associated with the use of such equipment would be approximately 0.089 in/sec PPV and 87 VdB at 25 feet, as shown in Table 3.8.7-9. Using the FTA's recommended procedure for applying a propagation adjustment to these reference levels, predicted worst-case vibration levels would exceed 0.2 in/sec PPV within 15 feet and 80 VdB within 42 feet of vibration-sensitive receptors. There are no noise-sensitive receptors located within 42 feet of these sites. Thus, construction-generated activities would not result in the exposure of persons to or generation of excessive vibration levels. As a result, this impact is considered less than significant under CEQA, and local, short-term, negligible, and adverse under NEPA.

Impact Determination (Poopenaut Pass Site)**:**

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Project-Generated, Operation-Related Stationary and Traffic Source Noise Levels.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	Local	Short-Term	Negligible	Adverse	LS
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse	MPH	Local	Short-Term	Negligible	Adverse	LS
Moccasin Powerhouse Passive Reflector	MPR	Local	Short-Term	Negligible	Adverse	LS

CEQA and NEPA Impacts:
N/A = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	Local	Short-term	Negligible	Adverse	LS
O'Shaughnessy Dam Diversion Tunnel	ODT	Local	Short-term	Negligible	Adverse	LS
O'Shaughnessy Stream Gauge	OSG	Local	Short-term	Negligible	Adverse	LS
O'Shaughnessy Water Quality Building	OWQ	Local	Short-term	Negligible	Adverse	LS
O'Shaughnessy Chalet (Cottage 1)	OC1	Local	Short-term	Negligible	Adverse	LS
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	Local	Short-term	Negligible	Adverse	LS
O'Shaughnessy Bunkhouse	OBH	Local	Short-term	Negligible	Adverse	LS
O'Shaughnessy Water Tanks	OWT	Local	Short-term	Negligible	Adverse	LS
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	Local	Short-term	Negligible	Adverse	LS
Lake Eleanor-Cherry Lake Tunnel	ECT	Local	Short-term	Negligible	Adverse	LS
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Short-term	Negligible	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	Local	Short-Term	Negligible	Adverse	LS
Cherry Pump Station	CPS	Local	Short-Term	Negligible	Adverse	LS
Cherry Water Tanks	CWT	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Garage and Warehouse	CGW	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Camphouse	CCH	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #1	CC1	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #2	CC2	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #3	CC3	Local	Short-Term	Negligible	Adverse	LS
Cherry Lake Cottage #4	CC4	Local	Short-Term	Negligible	Adverse	LS
Cherry Tower Site	CTS	Local	Short-Term	Negligible	Adverse	LS
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Negligible	Adverse	LS
Intake Switchyard	ISY	Local	Short-Term	Negligible	Adverse	LS
Kirkwood Powerhouse	KPH	Local	Short-Term	Negligible	Adverse	LS
Holm Powerhouse	HPH	Local	Short-Term	Negligible	Adverse	LS
Duckwall Mountain						
Duckwall Mountain	DWM	Local	Short-Term	Negligible	Adverse	LS
Jones Point						
Jones Point	JPT	Local	Short-Term	Negligible	Adverse	LS
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Negligible	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Oakdale, Moccasin, Yosemite National Park, and Stanislaus National Forest Area Sites

With respect to traffic source noise levels, long-term operations at the Oakdale, Moccasin, Yosemite National Park, and Stanislaus National Forest Area sites would only generate vehicle trips from routine maintenance, as no additional staff would be required. Assuming two one-way trips per day for routine maintenance, operations would result in approximately 4 one-way daily trips. Typically, traffic volumes have to double before an increase in noise levels is perceivable [3 dBA (CNEL/ Ldn)] along an affected roadway segment. Therefore, the addition of these daily trips on the local roadway system to existing volumes would be negligible.

Long-term operations would include sources of stationary source noise. For instance, the long-term operation of the Moccasin Peak, Intake Radio Site, Cherry Tower Site, and Burnout Ridge sites would include the use of an emergency backup generator. However, the proposed emergency generators at Moccasin Peak and Intake Radio sites would replace those that currently exist on the sites and, with respect to the Cherry Tower and Burnout Ridge sites, there are no sensitive receptors within the vicinity and the generators would be self-contained. Consequently, off-site traffic-generated and on-site stationary-generated noise would not result in the exposure of persons to or generation of levels in excess of applicable standards or create a permanent substantial increase in ambient noise levels in the project vicinity. As a result, this impact is considered less than significant under CEQA, and local, short-term, negligible, and adverse under NEPA.

Impact Determination (Oakdale, Moccasin, Yosemite National Park, Stanislaus National Forest Areas)**:**

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Alternative 3 is the same as Alternative 2, the Preferred Alternative, except that the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the Poopenaut Pass site identified for Alternative 2. Potential short-term and long-term noise impacts would be the same as those described for the Alternative 2. The same facilities would be constructed and installed, but at a different location for the Poopenaut Pass site. Implementation of Mitigation Measures would reduce short-term effects to noise resources.

3.8.7.4 Mitigation Measures

Mitigation Measure 1 – Noise – The SFPUC will require all construction equipment to be properly maintained and equipped with noise control, such as mufflers, in accordance with manufacturers' specifications throughout the entire construction project.

Mitigation Measure 2 – Noise – The SFPUC will require all construction activities to be limited to the hours of 7:00 am to 7:00 pm Monday through Saturday. The SFPUC will designate a project liaison responsible for responding to noise complaints during the construction phases of the project. The name and phone number of the liaison will be conspicuously posted at construction areas and on all advanced

notifications. This person shall take steps to resolve complaints, including periodic noise monitoring, if necessary.

3.8.7.5 Impairment

Impacts to noise associated with Alternative 1 are expected to be local, short-term, negligible, and beneficial. With the implementation of Mitigation Measures and adherence to management practices for Alternative 2 and 3 impacts, the park would not be impaired for future generations.

3.8.7.6 Cumulative Impacts

Cumulative effects on noise resources are based on analysis of projects in the Hetch Hetchy Communication System Upgrade project area. There are no identifiable projects that would contribute to adverse noise impacts. Other projects within the project area would be subject to noise control practices, implementation of Mitigation Measures, and adhere to management practices. Therefore, cumulative impacts would not be significant or adverse.

3.8.7.7 Conclusion Statement

Noise impacts are summarized below:

Project-Generated, Construction-Related Noise Levels

Warnerville Switchyard, all Moccasin Sites, Lake Eleanor Sites, Early Intake & Tuolumne River Area, Duckwall Mountain, Jones Point, and Burnout Ridge:

CEQA: Less than significant with mitigation incorporated

NEPA: Local, short-term, moderate, adverse

O'Shaughnessy Sites, Cherry Lake Sites

CEQA: No impact.

NEPA: Local, short-term, negligible, adverse

Poopenaut Pass:

CEQA: Less than significant with mitigation incorporated

NEPA: Local, short-term, major, adverse

Project-Generated, Construction-Related Vibration Levels

Warnerville Switchyard, all Moccasin sites, all Cherry Lake Sites, Early Intake & Tuolumne River Area, Duckwall Mountain, Jones Point, Burnout Ridge, and Poopenaut Pass

CEQA: Less than significant

NEPA: Local, short-term, negligible, adverse O'Shaughnessy Sites, Lake Eleanor Sites

CEQA: No impact

NEPA: Local, short-term, negligible, adverse.

Project-Generated, Operation-Related Stationary and Traffic Source Noise Levels

Warnerville Switchyard, all Moccasin sites, O'Shaughnessy Sites, Lake Eleanor Sites, Poopenaut Pass, Cherry Lake Sites, Early Intake and Tuolumne River Area, Duckwall Mountain, Jones Point, and Burnout Ridge.

CEQA: Less than significant

NEPA: Local, short-term, negligible, adverse

3.9 CULTURAL RESOURCES

This section describes potential cultural resources within the project area that consist of prehistoric sites and historic-era sites, buildings, and structures. This section also provides an analysis of potential effects of the project on these resources. This document, with the Archeological Survey Report (ART [revised by EDAW] 2007), is being used to fulfill, in part, the National Historic Preservation Act review and documentation process. In December 2006, the San Francisco Planning Department sent letters to individuals identified by the Native American Heritage Commission to inform them of the proposed project; formal Section 106 consultation for this project will be undertaken by the Park Service and documented separately.

3.9.1.1 Affected Environment

Natural Setting

The project area lies in the Central Sierra Nevada and encompasses numerous ecosystems as it climbs from 930 feet above mean sea level (amsl) at Moccasin to over 5,000 feet amsl at the O'Shaughnessy Dam. The topography of Tuolumne and Stanislaus Counties varies greatly from gently rolling terrain at the lower elevations, to steep hilly uplands deeply traversed by streams and tributaries that drain south to the Tuolumne River or north to the Stanislaus River. The majority of Tuolumne County is underlain by hard, impermeable bedrock such as greenstone and granite. Some of these rocks are fractured, and these fractures can yield relatively small amounts of groundwater to wells that intersect the fractures (Tuolumne Utilities District History, 2004). Stanislaus County, west of Tuolumne, bridges the gap from hard bedrock and shallow soils through the foothill Plio-Pleistocene sandstone and shale and into Central Valley unconsolidated and semi-consolidated alluvial soils (Jennings 1977).

The climate in the project area is characterized as humid mesothermal, meaning that it is Mediterranean or dry summer subtropical. The valley and foothill region has been termed the "thermal belt" due to its mild winter climate. Since the temperature is dependent upon elevation and air drainage, however, marked differences occur within short distances. In the depressions and small valleys the temperature is

lower, particularly during nights when cool air moves downward. The temperature is warmer on the slopes and tops of the ridges. High and low temperatures vary dramatically, ranging from winter lows of 12 degrees Fahrenheit to summer highs well over 100 degrees Fahrenheit.

Plant communities within the project vicinity today do not necessarily reflect what the nature of the vegetation would have been prior to historic modifications. Heavy grazing, mining, construction and fire suppression may have significantly impacted flora in the area. The addition of non-native floral and faunal species has likely also had an effect. Today, the region exhibits the traits characteristic of the Foothill or Gray Pine-Chaparral belt and has also been termed the Upper Sonoran Zone (Storer and Usinger 1963). This zone incorporates oak-pine woodland, chaparral, and grassland communities that support a wide variety of roots, bulbs, grass seeds and berries. Availability of these resources varies widely with the seasons and proximity to water such as the Stanislaus and Tuolumne rivers or tributary drainages. Fresh-water fish, anadromous fish such as salmon, game birds, and small, medium and large mammals would all have been available during the prehistoric era.

Prehistory and Ethnography

The earliest evidence of human occupation in the central Sierra Nevada dates to about 8000 B.C. In general, the lifeways of prehistoric populations in the highest Sierra Nevada mountain area are poorly understood. Ethnographic data regarding proto-historic and historic native populations reveal little insight into the high-elevation populations. Additionally, archeologists postulate that the adaptive strategies of early Holocene populations differ greatly from those of ethnographic times (Hull and Moratto 1999). The general consensus regarding prehistoric populations in the central Sierras is that they consisted of small, mobile units that moved seasonally to exploit both plant resources and game. While similar lifeways are postulated for both early and middle Holocene occupations, there is evidence of technological and economical changes. Temporal variations in the social organization and demography associated with population and environmental fluctuations as well as evolving cultural interactions are also apparent in the archeological assemblages (Hull and Moratto 1999).

Yosemite Valley includes evidence of thousands of years of human occupation, reflected in the large number of archeological sites. Over the last 50 years of archeological exploration, a major focus of study has been to determine when the area was first occupied, defining material culture changes since that time (Hull et al. 2002). Bennyhoff (1953, 1956) and Grosscup (1954) performed some of the early regional studies in the area, with Bennyhoff (1953) proposing a three-phase chronology valid for the region as a whole, including the Crane Flat, Tamarack, and Mariposa complexes. Dating was based upon comparisons with similar technological forms from Central California and Lake Tahoe (Hull et al. 2002).

Linguistic and ethnographic data confirm the archeological indications that around 1200-1400 A.D., the ancestral Central and Southern Sierra Miwok occupied the Sierra Nevada Mountains (Kroeber 1925, Levy 1978). Permanent villages were mainly established below 4,000 feet, and seasonal camps and villages were scattered throughout the area. The Miwok relied heavily on mule deer and acorns, yet the range of elevations within their territory provided a wide array of seasonal resources to exploit. The Miwok are associated with a rich social and ceremonial life, as evidenced through ethnographic observations (see Gifford 1916a, 1916b, 1951, 1955) as well as through a diverse material culture including wooden and

bone implements, flaked and ground stone tools, stone and shell beads and ornaments, and both twined and coiled baskets (Hull and Moratto 1999). Recent interpretations of Native California indicate that hunting and gathering knowledge shared through oral history informed culture, and culture shaped the way in which such factual knowledge was used to steward the environment.

No organized research has been conducted on the occupation of Hetch Hetchy during the post-contact period, yet there are ethnographic indications that the region was used into the end of the nineteenth century; for instance, the Paiute word for Poopenaut Pass means "many trails". Although Kroeber documented the Miwok village Hechhechi in the western portion of the valley in 1925, no temporal framework for the site was established (Montague and Mundy 1995). Two baskets were collected from an abandoned Indian camp in 1891 within the Valley (Bates and Lee 1990). They are of Miwok and Piute origin, confusing the delineation of the ethnicity of the native inhabitants. A review of Miwok, Paiute, and Washoe lifeways is provided in Napton (1978); it is clear that native cultures flourished in Yosemite for many centuries, yet by the mid-1850s the Euro-American appropriation of lands and resources in Yosemite—as well as exotic diseases—had effectively altered native lifeways.

The following was excerpted from C.F. Hoffman's Notes on Hetch-Hetchy Valley presented in 1867. Hoffman was a German-born topographer who was part of the California Geological Survey in the 1860s. The valley was first visited, in 1850, by Mr. Joseph Screech, a mountaineer of this region, who found it occupied by Indians. This gentleman informed me that, up to a very recent date, this valley was disputed ground between the Pah Utah [Paiute] Indians from the eastern slope and the Big Creek Indians from the western slope of the Sierras; they had several fights, in which the Pah Utahs proved victorious. The latter still visit the valley every fall to gather acorns, which abound in this locality (Hoffman 1868).

Bunnell (1911), through a series of interviews and personal observations made while a private with the Mariposa Battalion, documented some of the early relations between gold miners, settlers, traders and various Paiute bands that lived in the region. As hostilities increased, a series of raids and retaliatory expeditions finally led to the formation of the Mariposa Battalion, a volunteer militia, whose goal was to persuade Indian groups living in Yosemite to sign treaties and relocate to rancherias, harassing and pursuing groups that would not acquiesce.

Historic-Era Setting

Although controversy continues regarding the identity of the first Euro-American who entered Hetch Hetchy Valley, it was most probably one of the three Screech brothers: Joseph, Nathan, or William (Greene 1987). Nathan entered the valley in 1852 and spoke with its Indian inhabitants, who told him the name of the grass seeds they were eating was "hatch hatchy" (Greene 1987). Since by 1868 Joseph Screech had cleared a livestock trail to the valley, he was most associated with the verdant grazing grounds.

With the 1848 discovery of gold in Tuolumne County by Reverend James Wood near Jamestown, the Yosemite locality experienced a new phase of cultural activity. By 1849, thousands of miners had settled in makeshift camps along the county's streams and gulches. Relations between the miners and the American Indian population were initially relatively peaceful. However, a number of conflicts soon

occurred during the initial Gold Rush period. The largest of these was the Mariposa Indian War, sparked by an American Indian attack on the Fresno Crossing trading post on December 17, 1850.

In conjunction with coercive efforts to suppress uprisings such as the Mariposa Indian War, the federal government authorized three Commissioners to negotiate treaties with the American Indian population. In the treaties, Californian tribes agreed to "forever quit claim all their interests in lands in California to the United States, and to settle on the reserves established for them in the lower foothills" (Hull and Moratto 1999). Disease and shortages of food eventually led many of the assigned tribes to return to their homes. In the end, however, the toll on the regional aboriginal population was drastic: the 1845 population of 150,000 American Indians dropped to 100,000 by 1850 and to only 50,000 five years later (Cook 1976).

Yosemite National Park

Although Indian trails had existed in Yosemite for thousands of years, the impetus to build roads in the area came largely from the development of tourism, which began in 1855 when J.M. Hutchings led the first tourists into the Valley. An improved trail to the Valley was constructed in 1856, from Mariposa by way of the South Fork Merced River. By 1856, regular tourist travel had been established, and the first Valley floor hotel (the Lower Hotel) was built that same year. After the development of roads into the Valley, trails, bridges, and interconnecting roads soon followed. The 1880s saw the establishment of a network of routes between lodging and scenic locations. In 1907, the Yosemite Valley Railroad was completed from Merced to its terminus at El Portal, from which passengers could travel by wagon to the floor of the Valley. Inspired by artists and writers who portrayed the magnificence of Yosemite's wonders, tourists began to pour into Yosemite Valley in large numbers.

Congress established Yosemite as a preserve in 1864, when the Yosemite Valley and Mariposa Big Trees, containing 60.4 square miles, were granted to California as public trust on June 30. Even though it was not considered a "national park" at the time, it is clear from the legislation that the intent was to preserve a national treasure. A much larger protected area was created around the original Yosemite Valley Grant in 1890, when surrounding reserved forest lands were added. The area that became Yosemite National Park (YNP) was created on October 1, 1890, totaling 932,000 acres.

Water History

The history of the SFPUC water system starts with a driving need for water in an area that is often described as a semi-arid peninsula. The Gold Rush of 1849, brought tens of thousands of people to San Francisco as the possibility of securing wealth was a strong attraction. By 1870, the population of San Francisco was almost 150,000 (Page & Turnbull 2002). The scarcity of water from either surface or subterranean sources led to the development of private water companies such as Spring Valley Water Company. During the late 19th century, Spring Valley Water Company constructed a series of dams and reservoirs and began to dominate the city's water system. Spring Valley Water Company essentially created a monopoly on water and bought out all of the smaller water companies. Though Spring Valley Water Company was successful in its operations, they could not keep up with the increase of population.

By the mid 1870s, San Franciscans were becoming increasingly frustrated with Spring Valley Water Company's inadequate service and high rates (Page & Turnbull 2002).

In 1900 the new San Francisco City Charter mandated public ownership of utilities and Mayor James Phelan advocated for the construction of an aqueduct to entirely bypass the Spring Valley Water Company system (Page & Turnbull 2002). However, most hydrology experts believed that San Francisco's water shortage could be solved by the Sierra Nevada Mountains. The season snow pack in the Sierra Nevada Mountains resulted in millions of gallons of pure water. Mayor Phelan, City Engineer Carl Grunsky and the Board of Public Works compile a list of 14 possible watersheds in the Sierras for possible acquisition (Page & Turnbull 2002). The Tuolumne River was identified as the best source because it was capable of providing large quantities of water and electricity.

In 1901 Joseph B. Lippincott filed for rights to the water of the Tuolumne River located in Hetch Hetchy Valley as a private citizen. Lippincott signed these rights over to the City of San Francisco (Page & Turnbull 2002). Gaining rights to the water was the first step as the Tuolumne River was located in Yosemite National Park and to dam the area would require the approval of the Secretary of the Interior and the National Park Service. Opposition to dam the Hetch Hetchy Valley was led by John Muir and in 1903 the Secretary of the Interior denied the City of San Francisco's application to dam the Hetch Hetchy Valley (Page & Turnbull 2002).

Following the earthquake of 1906, San Francisco's efforts to dam Hetch Hetchy Valley gained momentum as there was limited water to fight destructive fires. In 1908 Secretary of the Interior James R. Garfield granted the so-called "Garfield Permit" which contained many of the same provisions that would be in the Raker Act of 1913. In 1909 the City of San Francisco purchased much of the patented land in the Hetch Hetchy Valley from private owners. In 1910 Secretary of the Interior R.A. Ballinger issued an "Order to Show Cause" which directed San Francisco to establish why it needed water from the proposed Hetch Hetchy Reservoir. Ballinger commissioned the U.S. Army Corps of Engineers to prepare a report on other potential water sources. The Corps report concluded that the Tuolumne River was the best source of water for San Francisco for several reasons: it was comparatively free of conflicting claims to water rights; could be economically developed; could generate power as a valuable by product of water deliveries; could provide a pure water source that was unlikely to be compromised by future human activity because the watershed was protected in a national park; and had sufficient water to accommodate the future demands of the Bay Area.

Under President Woodrow Wilson, Secretary of the Interior Franklin Lane (former San Francisco Attorney) recommended that the City of San Francisco seek congressional approval for the Hetch Hetchy reservoir.

In order to prove its need for more water, the City of San Francisco hired hydraulic engineer John R. Freeman. Freeman's report was instrumental in establishing a case for damming of Hetch Hetchy Valley. Freeman was from Rhode Island and had been a consulting engineer on the expansion of municipal water supplies for Boston and Los Angeles. Freeman worked with California engineers, C.E. Grunsky and Marsden Manson on the Hetch Hetchy water system. Freeman's report called for the construction of powerhouses to supply electricity for the project and for the city. Freeman's plan would allow for a

growing metropolis in the Bay Area. In 1913 President Woodrow Wilson signed the Raker Act, allowing San Francisco to construct the Hetch Hetchy Reservoir in Yosemite National Park (Page & Turnbull 2002). Congress ultimately supported the Raker Act because it served a public need that outweighed any potential detriment to the environment.

Construction of the Hetch Hetchy Reservoir and Aqueduct began in 1914 under Michael O'Shaughnessy, San Francisco's City Engineer (1912-1934). Mayor James Rolph gave O'Shaughnessy complete control over the project. O'Shaughnessy was born in Limerick, Ireland in 1864 and earned a Bachelor of Engineering degree from the Royal University of Dublin, Ireland. O'Shaughnessy arrived in San Francisco in 1885 and worked as an assistant engineer for Southern Pacific (Page & Turnbull 2002). O'Shaughnessy also worked as the Chief Engineer of the California Midwinter International Exposition prior to becoming City Engineer in San Francisco. O'Shaughnessy had many of the state's best engineers in his work force. The rebuilding efforts following the 1906 earthquake had brought many skilled engineers and construction laborers to the area, and they were eager for more work, especially under the leadership of the well-respected O'Shaughnessy.

Development of the Hetch Hetchy water system began shortly after the passage of the Raker Act of 1913. In 1918, Lower Cherry Diversion Dam and Aqueduct, the first major facilities in the system were completed. This enabled the generation of power at the Early Intake Powerhouse on the Tuolumne River and was critical to the development of the remainder of the system as it supplied power for construction efforts. The challenge in constructing the Hetch Hetchy water system was its remote location, which required construction of a range of supporting facilities in the immediate vicinity including a railroad for transporting materials and workers to the dam site, a sawmill to produce lumber, and a powerhouse to generate electricity for construction equipment.

The Hetch Hetchy water system includes multiple dams and reservoirs, conduits, power plants, and 150 miles of aqueduct to transport water from the Sierra Nevada Mountains to San Francisco. The system was designed as a gravity-fed system so that downhill gradients and siphons were used to transport water from the mountains to the city. The construction of such a large public works project took more than two decades and the Hetch Hetchy Aqueduct opened in 1934 (Page & Turnbull 2002). The Hetch Hetchy Aqueduct was split into segments according to geographic regions. From east to west these divisions were Lake Eleanor and Hetch Hetchy, Mountain, Priest, Moccasin, Foothill, San Joaquin, Coast Range, and Bay Divisions. After the completion of Early Intake Diversion Dam and Powerhouse (1918), other structures included Lake Eleanor Dam (1918), Lower Cherry River Power Plant (1918), and O'Shaughnessy Dam (1919-1923). Once the dams and powerhouses were complete, electricity generated by them was used to supply construction sites along the aqueduct route.

The O'Shaughnessy Dam, named for the engineer who oversaw its construction, was "…the crown jewel of the entire Hetch Hetchy Aqueduct" (Page & Turnbull 2002). The massive, concrete dam was constructed in two phases: 1919-1923 and 1935-1938. The dam consisted of large granite blocks embedded in concrete and had an arch-gravity construction with a 101-foot-deep foundation. The Utah Construction Company built the dam and they went on to become one of the major dam builders in the west. Utah Construction Company was responsible for the construction of 58 large dams between 1916

and 1969, including the Hoover Dam on the Colorado River. In order to build the dam, the Hetch Hetchy Railroad was constructed to carry equipment and supplies to the remote site. A temporary timber crib dam was built to divert the Tuolumne River around the future dam site. After this temporary dam was constructed, steam shovel and dynamite teams excavated down to bedrock. The bedrock was roughed out to accept the concrete foundation (Page & Turnbull 2002). Concrete was poured from chutes suspended from a 375-foot high hoisting tower constructed on the south wall of the gorge. The concrete pours were complete in February 1922 and when the dam was completed in May 1923, 398,516 cubic yards of concrete had been poured (Page & Turnbull 2002). O'Shaughnessy Dam was designed to be enlarged when the need for additional water or electricity demanded a larger structure. O'Shaughnessy Dam was put into use on May 25, 1923 (Page & Turnbull 2002).

Components of the Hetch Hetchy Aqueduct that extended west from O'Shaughnessy Dam to the Moccasin Powerhouse included Priest Reservoir (1923) that was built to regulate the flow of water to Moccasin Powerhouse (1925). Water from the Hetch Hetchy Reservoir was diverted through Mountain Tunnel (1925). The tunnel traveled through solid granite and was a concrete-lined passage that conveyed water to Priest Reservoir and then the Moccasin facility. Water moved through Moccasin Power Tunnel, down the penstock to Moccasin Powerhouse where electricity was generated during peak hours. In 1925 other facilities and a small city-owned town, originally known as Moccasin Camp, opened around the Moccasin Powerhouse. The town along with the powerhouse was designed in the Mission Revival architectural style. Other components of the water system included Foothill Tunnel (1928), Tesla Portal (1928), and the Coast Range Tunnel (1934). The final leg of the water system was the Bay/Peninsula Division. This 25-mile long pipeline extended to Crystal Springs Reservoir in San Mateo County (Page & Turnbull 2002). From this reservoir water is transported north into San Francisco.

During construction of the Hetch Hetchy water system, the city acquired the Spring Valley Water Company for $39.96 million in 1930. This led to the creation of the San Francisco Water Department under the Department of Public Works. The first water from the Sierras flowed into Crystal Springs Reservoir on October 28, 1934 at Pulgas Water Temple in Woodside (Page & Turnbull 2002). Michael O'Shaughnessy was not able to realize the success of his work as he died two weeks before the Hetch Hetchy Aqueduct was formally opened.

In 1932 a new City Charter established the San Francisco Public Utilities Commission (SFPUC) to manage the Hetch Hetchy Project, the Water Department, San Francisco Municipal Railway, and the Airport. Throughout the 1930s, SFPUC made improvements and expanded the water system. In 1938 the O'Shaughnessy Dam was raised to its current height of 312 feet (SFPUC 2007). This increased the capacity of Hetch Hetchy Reservoir to more than 360,000 acre-feet (117 billion gallons).

Other improvements undertaken in the following decades included the construction of dams and reservoirs to increase the storage capacity of the water system. This included Moccasin Dam (1934), Merced Manor Reservoir (1936), University Mound Reservoir (1937), and Sunset Reservoir (1938). Pipelines were also added to enhance the amount and dependability of the water supply. Bay Division Pipeline No. 2 ran parallel to the first pipeline and went into service in 1936. Bay Division Pipeline Nos. 3 and 4 routed around the south end of San Francisco Bay and entered service in 1956 and 1973,

respectively (SFPUC 2007). In 1953 a second San Joaquin Pipeline was constructed and put into service (SFPUC 2007). A third San Joaquin Pipeline was completed in 1968.

Between 1953 and 1955, the City of San Francisco constructed Cherry Dam and created Lake Lloyd near Lake Eleanor Dam. Additional power tunnels and powerhouses were also added to this portion of the water system. In the 1960s, the completion of the Holm, Kirkwood, and the new Moccasin powerhouses increased power generation capacity (SFPUC 2007). The Hetch Hetchy water system continued to evolve during the late 1960s and 1970s. The focus shifted slightly to water quality issues as Congress passed the Clean Water Act in 1972. Facilities constructed during this period include the Pulgas Pump Station and Balancing Reservoir, Pulgas Bypass Tunnel, Crystal Springs Bypass, San Andreas Treatment Plant, Sunol Valley Water Treatment Plan, and San Antonio Pump Station, Pipeline and Reservoir. These improvements were designed to make the water system more modern and efficient.

Archeological Investigations in the Region

While the first American Indian villages were documented as early as 1850, through the accounts of L. H. Bunnell of the Mariposa Battalion (1990), formal archeological investigations in Yosemite National Park did not occur until the mid-twentieth century. The first systematic archeological excavations took place between 1952 and 1954 by University of California, Berkeley archeologists led by James Bennyhoff and Gordon Grosscup. These efforts recorded more than 300 archeological sites and lead to the determination of the three cultural complexes defined in the Yosemite chronological sequence. Since then, efforts have focused on understanding the nature of the prehistoric populations in the region. In addition to surveys, subsurface testing, and construction monitoring, researchers have produced syntheses of Yosemite archeology in attempts to provide contexts for evaluating archeological deposits; two notable contributions include Greene (1987) and Snyder et al (1989, 1990). In 1981, a Parkwide Research Design, constructed by Michael Moratto, was adopted. As of late, Hull and Moratto (1999) produced the most comprehensive and up-to-date compilation and synthesis of archeological knowledge, which includes valuable recommendations for future research.

Despite the number and variety of archeological studies conducted in the Park, the "Parkwide" archeological database (compiled by Greene in 1987) is not a representative sample (Hull and Moratto 1999). The majority of archeological work conducted in the Park has focused on developed areas and was conducted to meet compliance requirements. Therefore, the number of intense investigations outside of the developed portions of the Yosemite Valley and other developed areas, such as El Portal, Wawona, and South Entrance/Mariposa Grove, is relatively small. There are a few exceptions. The Lake Eleanor region was subject to surveys in 1951 and again in 1985 (Greene 1987, Carpenter and Kirn 1988). In 1991, National Park Service archeologists surveyed exposed areas of Hetch Hetchy Reservoir, documenting nine sites and 11 isolated objects (Montague and Mundy 1995). Greene (1987) provides a complete inventory of archeological investigations in YNP beginning in the 1880s; Hull and Moratto (1999) provide a focused examination of the archeological research conducted in the park since 1981. Due to the remote locations of the current project sites, the direct archeological information is scarce. Much of the prehistoric context relies upon inferences drawn from data collected in the park as well as from the Sierra Nevada, the Central Valley, and the Great Basin.

Background Research

Paleontological Resources

The project includes earthmoving activities at the following four locations: Intake Radio Station, Poopenaut Pass, Cherry Lake Tower, and Burnout Ridge. A review of geologic maps (Strand 1967 and Wagner et al. 1991) indicates that the rock formations underlying those four localities consist of medisedimentary rocks of the Calaveras Complex (from the Paleozoic Era), and granitic and volcanic rock formations from the Mesozoic Era, that do not contain vertebrate fossils, and thus would not be considered paleontologically sensitive rock formations.

Cultural Resources

To gain a general understanding of cultural resources that are situated at proposed project locations, background research and field surveys were performed. ART completed standard records searches at the Central California Information Center (CCIC) in Turlock in 2004 and 2006, as well as a literature search at the Groveland Ranger District Station of the United States Forest Service, Groveland Museum and Library, Yosemite National Park Research Library, and in person with staff of Yosemite National Park. As part of the records searches historic maps were reviewed.

The following discussion summarizes the results of the records searches by project area. A number of cultural resources have been documented within ½ mile of the project site locations. Although none of these resources outside the project site locations would be affected by the proposed action, their presence is noted as they provide indications of the overall archaeological and historical sensitivity of the project sites and surrounding area.

Warnerville Switchyard

The record search revealed that no cultural resources have been recorded in this project area. A lithic scatter was recorded (True & Slaymaker 1981) approximately 1/3-mile from the Warnerville Switchyard. Four archaeological surveys were performed within a ½-mile radius of the Warnerville Switchyard project site; all with negative results (Napton 1992, Peck 1978, True & Slaymaker 1981, and Wilson 1976).

Moccasin Peak, Moccasin Powerhouse, and Moccasin Passive Reflector

The record search revealed that no cultural resources have been recorded in these project areas.

The CCIC record search listed two previous archaeological investigations at the project site, CCIC No. 1601 (Napton 1992) and CCIC No. 3739 (Hollett 1999). Napton's 1992 survey identified prehistoric habitation site P-1090, located approximately ¼ mile west of the powerhouse, and well beyond the project site at Moccasin Powerhouse. Hollett's 1999 study was a CDF project review report, and not an intensive archaeological survey. It covered the Moccasin Powerhouse Passive Reflector project location and vicinity. Five additional investigations were reported within ½-mile of the project area, including CCIC No. 1236 (Napton 1989); CCIC No. 3530 (Napton 1999); CCIC No. 3759 (Napton 2000); CCIC No. 5292 (Francis 2003); and CCIC No. 4050 (Decker 2000). A number of cultural resources were recorded within the ½-mile search radius of the Moccasin sites; these are listed in Table 3.9-1

Table 3.9-1. Cultural Resources in the Moccasin Site Vicinity

Primary (P) No.	Trinomial	Site Description
55-001090		prehistoric occupation site
55-000110		Hetch Hetchy Railroad Grade
55-001433	CA-TUO-410	prehistoric occupation, burial & milling site
55-002360	CA-TUO-1364H	old road alignment (Old Priest Grade Road)
55-003544		mud structure, mining features, dump
55-005295	CA-TUO-4261H	Priest Tunnel machinery pads & footings
55-006018		historic refuse scatter
55-006882		Old Highway 49 segment
55-006983		Moccasin Powerhouse Dam
55-006984		culvert & headwall
Source: CCIC 2004		

O'Shaughnessy Sites

The record search revealed that one cultural resource, a structure, has been recorded in the project area. No archaeological resources have been recorded in the project areas. The structure, the O'Shaughnessy Dam Lower Valve House, was surveyed by Page & Turnbull (CCIC Study. No. 5313). However, no resource number was assigned by the CCIC for this resource, which has also not been added to the current *Historic Property Data File*. Seven cultural resources were recorded within a ½-mile radius of the O'Shaughnessy project sites; these are listed in Table 3.9-2. The record search revealed four investigations were performed within the ½-mile search radius including CCIC No. 3075 (Kim 1987), CCIC No. 3401 (Stromberg 1998), CCIC No. 3566 (Keefe *et al.* 1998), and CCIC No. 3728 (Unrau 1998).

Table 3.9-2. Cultural Resources in the O'Shaughnessy Site Vicinity

Primary (P) No.	Trinomial	Site Description
55-001537	CA-TUO-515	bedrock milling site
55-001538	CA-TUO-516	prehistoric occupation and milling site
55-004543	CA-TUO-3986	lithic scatter
55-004544	CA-TUO-3987	bedrock milling site and lithic scatter
55-004505	CA-TUO-3963H	Lake Eleanor Road and associated features
55-004602		two isolate obsidian flakes
55-006904	CA-TUO-4698H	historic refuse scatters and dumps
Source: CCIC 2004		

Cherry Pump Station, Cherry Water Tanks, Lake Eleanor-Cherry Lake Tunnel, Lake Eleanor Dam Level Gauge, Burnout Ridge, and Duckwall Mountain

The records search revealed that five cultural resources associated with the construction of Lake Eleanor Dam have been recorded in the project area. This includes the following archaeological sites: P-55-001081, P-55-006148, P-55-001062, P-55-006162, and P-55-006168. These sites are inundated. Primary Site No. 55-006148 is comprised of seven historical features, a light historical artifact scatter, and a very light debitage deposit located on a flat terrace adjacent to Eleanor Creek. This has been inundated since 1918, and is only infrequently exposed when reservoir draws are down (Montague and Kahl 2000). Similarly, P-55-006162 consists of segments of the historical road network on the Lake Eleanor Reservoir

floor, also inundated since 1918. The record search did not reveal any listed historic buildings or structures in the project area.

Three investigations that included the project area were reported to the CCIC: CCIC No. 1206, CCIC No. 1210 (Moriarty & Ray 1989), CCIC No. 1210 (Napton 1974), and CCIC No. 2809 (Marsh 1995). Twelve other investigations were reported for areas that came within the ½-mile radius of the project area. During these efforts, 16 sites were noted within a ½-mile radius of this portion of the project area; these are listed in Table 3.9-3.

Table 3.9-3. Cultural Resources in the Cherry, Lake Eleanor, Burnout Ridge, and Duckwall Mountain Site Vicinities

Primary (P) No.	Trinomial	Site Description
55-000016	CA-TUO-1536H	West Side Lumber Company Railroad
55-110162	CA-TUO-322	bedrock mortars 2/adjoining midden
55-001080	CA-TUO-50/H	historic refuse; 1 obsidian scraper
55-001081	CA-TUO-51/H	large prehistoric & historic site w/2 loci; probable Lake Eleanor sawmill site; original Baumhoff 1956 survey; 2000 NPS record
55-001082	CA-TUO-52	milling features, lithic scatter, historic fence
55-001084	CA-TUO-54	milling site with obsidian lithic scatter
55-004134	CA-TUO-3158H	Ham-Hall Trail
55-004505		filed under other project location
55-004821	CA-TUO-4127H	historic trail along Cherry Creek; USFS
55-004867		unidentifiable historic feature
55-006076		bedrock milling stations; USFS
55-006148	CA-TUO-5476/H	Lake Eleanor construction; lithic scatter
55-006162		historical road segments under Lake Eleanor
55-006168	CA-TUO-4392/H	small pre- and historic site; inundated
FS#05-16-54-624		Bedrock milling site; monitoring record only
FS#05-16-54-626		No record on file; referred to USFS
Source: CCIC 2004 and 2006		

Holm Powerhouse, Jones Point, Intake Switchyard, Kirkwood Powerhouse, and Duckwall Mountain

The record search revealed that no cultural resources have been recorded in these project areas.

One investigation is on file that includes a portion of the specific project area: CCIC No. 4373 by Jonathan Ruhan (1998); 26 other reports have been filed with the CCIC that include some part of the ½-mile search radius. The CCIC has records for 12 cultural resources within ½-mile of the project area; these are listed in Table 3.9-4.

Table 3.9-4. Cultural Resources in the Duckwall Mountain, Holm, Jones Point, Intake Switchyard, and Kirkwood Site Vicinities

Primary (P) No.	Trinomial	Site Description
55-000314	CA-TUO-3559	probable prehistoric habitation site
55-000896	CA-TUO-3889/H	multicomponent; Hetch Hetchy; BRMs
55-000901	CA-TUO-1862H	Keystone Ditch (pre-1880)
55-000906	Isolate No. 698-2	obsidian flake fragment

Table 3.9-4. Cultural Resources in the Duckwall Mountain, Holm, Jones Point, Intake Switchyard, and Kirkwood Site Vicinities

55-002327	CA-TUO-1331	prehistoric permanent occupation site
55-003097	CA-TUO-2124	milling site
55-003419	CA-TUO-2445/H	pre- and historic Jones Meadow Site
55-003535	CA-TUO-3154	sparse lithic scatter
55-004001	CA-TUO-3017H	can dump with possible structure pad
55-004138	CA-TUO-3162	sparse lithic scatter
55-003390	CA-TUO-4357	milling site
55-004357	CA-TUO-3390	milling site
Source: CCIC 2004 and 2006		

Survey Results

The project areas were surveyed for archaeological and architectural resources. The information below summarizes survey results.

Archaeological Resources

An archaeological survey of the project sites was conducted by ART. No archaeological resources were identified at any of the proposed project locations, although prehistoric and historic-era archaeological sites have been identified in the project vicinity. Cultural resources field surveys carried out in 2006 relocated one previously documented prehistoric site (CA-TUO-515, located outside the project area) and identified two historic-era resources. One of historic sites, a can dump, was subsequently eliminated from the project area when the proposed project was modified. The second historic-era resource consists of the remains of the Jones Point Fire Lookout; however the building was removed before project surveys commenced.

Architectural Resources

Historic architectural resources were identified in three project areas including Moccasin Powerhouse, O'Shaughnessy Campus Sites, and Lake Eleanor Sites. These resources are described below. No other project sites contained architectural resources.

Moccasin Powerhouse

The old Moccasin Powerhouse, constructed in 1925, was designed in the Mission Revival architectural style. The old Moccasin Powerhouse is 225 foot long, 98 feet wide, and 67 feet high (SFPUC 2005). The reinforced concrete powerhouse sits on bedrock. The powerhouse and its machinery cost $2.4 million dollars to build in 1925 and it remained active for 44 years (SFPUC 2005:36). During the time it was used, four generators rated at 20 kilowatts (kW) each produced $115 million worth of electrical power (SFPUC 2005). With massive parapet end walls, a red tile roof, large divided light arched windows, and unadorned wall surfaces the building is representative of Mission Revival architecture. The old Moccasin Powerhouse was used until the new powerhouse was put into service in 1969. The new concrete powerhouse was constructed immediately to the south of the old Moccasin Powerhouse.

The old Moccasin Powerhouse appears eligible for the CRHR under Criteria 1 and 3. The building appears to meet Criterion 1 for its association with the Hetch Hetchy Aqueduct and water system, one of

the most ambitious and important municipal water projects constructed in California and the nation. The Hetch Hetchy Aqueduct and its associated structures such as the old Moccasin Powerhouse were critical in providing water and power to the City of San Francisco. Therefore, as a key component of the Hetch Hetchy water system, the Old Moccasin Powerhouse can be associated with events that made a significant contribution to the development of San Francisco Bay Area. In addition to its historic associations, the old Moccasin Powerhouse appears eligible under Criteria 3 as an example of the Mission Revival architectural style. With its parapet end walls, red tile roof, large arched openings, and unadorned wall surfaces the building is a good example of Mission Revival architecture.

O'Shaughnessy Campus Sites

O'Shaughnessy Dam

The O'Shaughnessy Dam, built of cyclopean concrete, was constructed in two phases: 1919-1923 and 1935-1938. The dam consists of large granite blocks embedded in concrete and is of arch-gravity construction with a 101-foot-deep foundation. Originally, the O'Shaughnessy Dam stood 226.5 feet tall with a storage capability of 206,000 acre feet of water. When dedicated on July 7, 1923, O'Shaughnessy Dam was the largest single structure on the west coast (SFPUC 2005). Designed to be enlarged, in 1935 work began to increase the size of the dam. The dam was raised 85.5 feet in elevation and enlarged to a length of 910 feet at the crest and a width of 298 feet at the base. The side-channel-type spillway has three drum gates to provide additional storage when the reservoir is full. In addition, water from Hetch Hetchy Reservoir can be released through 14 outlet conduits. Three of these outlets transport San Francisco's drinking water into Canyon Power Tunnel for hydroelectric power generation at Hetch Hetchy's powerhouses before the water makes its way to the Bay Area (SFPUC 2005). The other 11 outlets are regulated by manually-operated valves ranging from 3 to 6 feet in diameter.

The O'Shaughnessy Stream Gauge is a character-defining feature of O'Shaughnessy Dam. The stream gauge is a conical, mortared stone structure. It was built in 1925 and is located approximately 4,500 feet downstream from the dam. It was used to measure the stream flow and level of water released from the dam.

The O'Shaughnessy Dam appears eligible for the CRHR under Criteria 1, 2, and 3. As the centerpiece of the Hetchy Hetchy Aqueduct and water system, O'Shaughnessy Dam appears to meet Criterion 1 for its association with one of the most ambitious and important municipal water projects constructed in California and the nation. The Hetch Hetchy Aqueduct was the outcome of San Francisco's efforts to obtain a reliable source of water. The O'Shaughnessy Dam also appears eligible under Criterion 2 for its association with Michael O'Shaughnessy, the mastermind engineer behind the design of the Hetch Hetchy water system. As one of the largest engineering projects of its time and as an example of Michael O'Shaughnessy's design talent, O'Shaughnessy Dam appears eligible under Criterion 3. When it originally opened, O'Shaughnessy Dam was the largest structure on the west coast. The dam appears eligible under Criterion 3 as an example of an early major concrete gravity dam constructed in California and for the massive construction and engineering achievement represented by the structure.

O'Shaughnessy Chalet

The O'Shaughnessy Chalet was constructed in 1938 for President Teddy Roosevelt's visit to O'Shaughnessy Dam by the City of San Francisco (Antonia Fairbanks, personal communication 2007). Following Roosevelt's visit, the building was used to house distinguished visitors visiting the dam. The one-story, U-shaped building reflects the rustic style of architecture. Rustic architecture was a common style used in the nation's park during the early 20th century, from approximately 1916 to 1942 (National Park Service 1977). Rustic architecture was designed to harmonize with its immediate environment which was often a park. Therefore, the use of wood and stone and an emphasis on workmanship and construction were common characteristics of this style. The O'Shaughnessy Chalet exhibits many of these characteristics with its wood shingle clipped-gable roofs, horizontal wood siding, battered mortared granite buttresses, a granite fireplace, and a large granite foundation. In addition, double-hung, wood windows are found throughout the building.

The O'Shaughnessy Chalet appears eligible for the CRHR under Criteria 1 and 3. Constructed prior to President (Teddy) Roosevelt's visit to O'Shaughnessy Dam, the building is associated with historic events including the construction of the Hetch Hetchy water project. In addition, the building was constructed for a presidential visit in 1938 following the enlargement of O'Shaughnessy Dam. The O'Shaughnessy Chalet also appears eligible under Criterion 3 as representative of rustic architecture. The use of natural materials such as wood and stone, and the emphasis on construction techniques in the O'Shaughnessy Chalet are typical features of rustic architecture, particularly the rustic architecture designed by architects working for the National Park Service. Designed to blend with their environment, the materials used in rustic style buildings often reflect their immediate surroundings as in the case of the O'Shaughnessy Chalet. Therefore, the building appears eligible for the CRHR under Criterion 3 as an example of rustic architecture.

O'Shaughnessy Watershed Keeper's Office/Residence

The O'Shaughnessy Watershed Keeper's Office was constructed in 1938 by the City of San Francisco. The building originally was constructed as the office and living quarters for the dam tender. It functions in much the same way today as it is used by the watershed keeper who monitors and manages the Hetch Hetchy Reservoir and O'Shaughnessy Dam (Antonia Fairbanks, personal communication 2007). The one-story, L-shaped building exhibits elements of rustic architecture. The building is of wood-frame construction and has a gable roof with slightly overhanging eaves and exposed rafters. The building is clad with horizontal wood siding. The face of the front gable is clad with wood shingles. Fenestration throughout the building consists of divided light wood windows.

The O'Shaughnessy Watershed Keeper's Office appears eligible for the CRHR under Criterion 1 for its associations to the O'Shaughnessy Dam and the Hetch Hetchy water project. As the building that housed the office and residence of the dam tender, the structure can be associated with the operations and maintenance of the O'Shaughnessy Dam. As one of the structures that enabled the construction and operations of the growing Hetch Hetchy water system, the O'Shaughnessy Watershed Keeper's Office appears to be significant under Criterion 1.

O'Shaughnessy Bunkhouse

The O'Shaughnessy Bunkhouse was built in 1938 by the City of San Francisco (Antonia Fairbanks, personal communication 2007). The building was originally used to house city employees working at O'Shaughnessy Dam or Hetch Hetchy Reservoir. It was also used to house guests visiting the dam. The one-story building is rectangular in plan, clad with horizontal wood siding, and features a gable roof with an overhanging eave. The front porch is supported by a granite foundation and wood posts. The standing-seam, metal roof appears to have been recently rebuilt. Fenestration consists of double-hung wood windows arrange in pairs and as single units. The building exhibits some characteristics of rustic architecture, but is a modest example of the style.

The O'Shaughnessy Bunkhouse appears eligible for the CRHR under Criterion 1 for its associations to the O'Shaughnessy Dam and the Hetch Hetchy water project. Constructed to house employees of the city working on the dam, the building can be associated with the early construction efforts surrounding the Hetch Hetchy water system. The Hetch Hetchy Aqueduct and water system represent the outcome of San Francisco's efforts to obtain a reliable source of water. The O'Shaughnessy Bunkhouse can be directly associated with the construction of this water system and therefore appears eligible under Criterion 1.

O'Shaughnessy Water Tanks

Two conically-shaped redwood water tanks are located adjacent to the O'Shaughnessy Dam. The tanks are supplied with water pumped upslope into them and then distributed to the various buildings through an elevated, boxed flume system that encases a pipe. Gravity allows the water to flow downhill. These tanks were constructed in the 1940s and used to store water for people working at O'Shaughnessy Dam and Hetch Hetchy Reservoir (Antonia Fairbanks, personal communication 2007).

The water tanks associated with O'Shaughnessy Dam appear eligible for the CRHR under Criterion 1. The tanks were instrumental in supplying and storing water for people working at the dam and Hetch Hetchy Reservoir. Therefore, they can be associated with significant historic events and the construction of the Hetch Hetchy water system which was one of the most significant municipal water projects in California and the nation. Therefore, for direct associations to the Hetch Hetchy water system, the O'Shaughnessy Water Tanks appear eligible for the CRHR under Criterion 1.

Lake Eleanor

Lake Eleanor Dam

The Lake Eleanor Dam was constructed in 1918 and was the first dam of the Hetch Hetchy water system. The dam is a multi-arch concrete design, 1,260 feet long and 70 feet high, creating a reservoir impounding 27,100 acre feet (SFPUC 2005). The dam contains 20, 40-foot span arches. Construction began in August 1917 and was complete after ten months. Lake Eleanor Dam was crucial to providing the water for the operation of Early Intake Powerhouse on the Tuolumne River (SFPUC 2005). Early Intake Powerhouse was critical to the construction of the Hetch Hetchy water system as it provided a dependable source of electricity which enabled continuous construction activities including nighttime work.

The Lake Eleanor Dam appears eligible for the CRHR under Criteria 1 and 3. The dam is eligible for its association with the Hetch Hetchy Aqueduct and water system, one of the most ambitious and important municipal water projects constructed in California and the nation. The construction of the Hetch Hetchy water system provided the water source for San Francisco and can be associated with events that made a significant contribution to the development of San Francisco Bay Area. As the first dam constructed, Lake Eleanor was a critical component in Michael O'Shaughnessy's plans for the construction of the remaining features of the water system. Lake Eleanor Dam provided a dependable water source for the Early Intake Powerhouse which provided the electricity to run the boring drills, construction tools and other equipment, and light to work in the dark forested mountains. Therefore, for these associations to important and significant historic events, Lake Eleanor Dam appears eligible for the CRHR under Criterion 1. Lake Eleanor Dam also appears eligible for the CRHR under Criterion 3 for its engineering and as an example of an early concrete, gravity dam. As one of the first dams constructed for the Hetch Hetchy water system in a remote location, the construction of the structure was an engineering achievement.

3.9.1.2 Thresholds of Significance

Regulatory Environment

The Hetch Hetchy Communication System Upgrade Project involves both federal and state jurisdictions. Correspondingly, this investigation was carried out in accordance with the following: 36 CFR 800 et seq. ("Protection of Historical and Cultural Properties"); Sections 106 and 110 a (2) of the National Historic Preservation Act (NHPA) as amended (16 USC 470h-2) and its implementing regulations 36 CFR Parts 60 and 63; Executive Order 11593, Protection and Enhancement of the Cultural Environment; and Section 110 (b)(4) of the National Environmental Policy Act (NEPA) of 1969, as amended. Since the project involves telecommunication upgrades, this study also takes into consideration the current *Nationwide Programmatic Agreement for the Collocation of Wireless Antennas*.

Of the 32 total sites comprising the Hetch Hetchy Communication System Upgrade Project, all but four of the sites are managed by the City and County of San Francisco under the terms of the Raker Act. The four sites not managed by the City and County of San Francisco under the terms of the Raker Act include Duckwall Mountain, Jones Point, Burnout Ridge, and Poopenaut Pass. Three of these sites (Duckwall Mountain, Jones Point, and Burnout Ridge) are managed by the US Forest Service and one site, Poopenaut Pass is within the boundaries of Yosemite National Park and managed by the National Park Service. Therefore, these four sites are the only sites subject to NEPA. The remaining sites, and the whole of the proposed action, are subject to CEQA.

The following discusses the regulatory framework at the federal and state levels and the corresponding significance criteria.

CEQA Criteria for Evaluation

CEQA guidelines define a significant cultural resource as "a resource listed in or eligible for listing on the California Register of Historical Resources (CRHR)" (Public Resources Code section 5024.1). A historical resource may be eligible for inclusion in the CRHR if it:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(2) Is associated with the lives of persons important in our past;

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or

(4) Has yielded, or may be likely to yield, information important to prehistory or history.

Properties eligible for listing on the National Register of Historic Places are automatically eligible for listing on the CRHR. Even if a resource is not listed in, or determined eligible for listing in, the California Register of Historical Resources, the lead agency may consider the resource to be an "historical resource" for the purposes of CEQA provided that the lead agency determination is supported by substantial evidence (CEQA Guidelines 14 CCR 15064.5). In addition, CEQA also distinguishes between two classes of archeological resources: archeological sites that meet the definition of a historical resource as above, and "unique archeological resources." An archeological resource is considered "unique" if it:

- Is associated with an event or person of recognized significance in California or American history or of recognized scientific importance in prehistory;
- Can provide information that is of demonstrable public interest and is useful in addressing scientifically consequential and reasonable research questions;
- Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;
- Is at least 100 years old and possesses substantial stratigraphic integrity; or

Involves important research questions that historical research has shown can be answered only with archeological methods (PRC 21083.2).

CEQA Thresholds

In accordance with the CEQA Guidelines §15064.5(b) a project would have a significant effect on the environment if it results in a substantial adverse change in the significance of an historical resource. Substantial adverse change is defined as "…physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired."

The significance of a historical resource is materially impaired when a project:

- Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and justify its inclusion in the California Register of Historical Resources or;
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in a historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency review of the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

Pursuant to Section 15064.5 of the CEQA Guidelines, a lead agency is required to identify potentially feasible measures to mitigate significant adverse changes in the significance of a historical resource.

Generally, under CEQA, a project that conforms to the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (Weeks and Grimmer 1995) shall be considered as mitigated to a level of less than a significant impact on the historical resources (Public Resource Code §15064.5(b)(3)).

The City and County of San Francisco has not formally adopted significance standards for impacts related to archeological resources, but considers that implementation of the proposed project would have a significant impact if it were to:

- Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code
- Cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines Section 15064.5
- Directly or indirectly destroy a unique paleontological resource, site, or unique geologic features
- Disturb any human remains, including those interred outside of formal cemeteries

NEPA Thresholds (National Park Service/US Forest Service Sites)

NEPA Criteria for Evaluation

The National Register of Historic Places (NRHP) is the Federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture. Properties listed in the NRHP have significance to the prehistory or history of their community, State, or the Nation. To qualify for listing in the NRHP, structures have to meet one or more of the criteria presented in 36

CFR 60. This includes districts, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield information important in prehistory or history.

A traditional cultural property is defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. The traditional cultural significance of a historic property is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. Examples of properties possessing such significance include:

- a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world;
- a rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents;
- an urban neighborhood that is the traditional home of a particular cultural group, and that reflects its beliefs and practices;
- a location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; and
- a location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historic identity.

NEPA Thresholds

NEPA Thresholds are provided below for archaeological resources and traditional cultural properties. No architectural resources were identified at the four sites managed by the National Park Service of the US Forest Service. Therefore, impacts to architectural resources are not considered in this analysis.

NEPA Thresholds for Archeological Resources

Duration of Impact

Impacts to cultural resources could be of short-term, long-term, or permanent duration. Any change to the physical attributes of an archeological site is considered long-term and of permanent duration.

Analysis of the duration of impacts is required under NEPA, but is not required and is not usually considered in assessing effects in terms of the National Historic Preservation Act.

Type of Impact

Impacts are considered either adverse or beneficial to cultural resources when analyzed under NEPA. However, impact type is not viewed this way when conducting analysis under Section 106 of the National Historic Preservation Act. For the purposes of assessing effects to NRHP-eligible properties under the NHPA, effects are either adverse or not adverse. Effects under both NEPA and the NHPA are considered adverse when they diminish the significant characteristics of a historic property. Impacts can be either direct or indirect. Direct impacts result from specific actions, such as demolition of historic structures. Indirect impacts generally occur after project completion, and are a result of changes in visitor-use patterns or management of resources fostered by implementation of an action.

Intensity of Impact

The intensity of an impact on a cultural resource can be defined as negligible, minor, moderate, or major. Negligible impacts would be barely perceptible changes in significant characteristics of a historic property. Minor impacts would be perceptible and noticeable, but would remain localized and confined to a single element or significant characteristic of a historic property (such as a single archeological site containing low data potential within a larger archeological district, or a single contributing element of a larger historic district). Moderate impacts would be sufficient to cause a noticeable but not substantial change in significant characteristics of a historic property (such as an archeological site with moderate data potential or a small group of contributing elements within a larger historic district). Major impacts would result in substantial material alteration or destruction of the property or cause highly noticeable changes to any qualifying characteristics of a property that contribute to its historic significance (such as an archeological site with high data potential or a large group of contributing elements within a larger historic district).

NEPA also calls for a discussion of the "appropriateness" of mitigation, and an analysis of the effectiveness of mitigation. A reduction in intensity of impact from mitigation is an estimate of the effectiveness of this mitigation under the NEPA. It does not suggest that the level of effect, as defined by implementing regulations for Section 106 of the National Historic Preservation Act, is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effects nonetheless remain adverse.

NEPA Thresholds for Traditional Cultural Properties

Duration of Impact

Any impacts to traditional cultural properties are considered long-term and of permanent duration.

Intensity of Impact

Under NHPA, impacts to traditional cultural properties are considered to have either an adverse effect or no adverse effect. No impact occurs when there are no traditional cultural properties present, or the action will have no effect on traditional cultural properties. When the impact of an action results in no alterations to the characteristics of a traditional cultural property which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have no adverse effect. When the impact

of an action results in an alteration to the characteristics of a traditional cultural property which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have an adverse effect.

Type of Impact

Adverse impacts occur when physical changes to a traditionally used resource or its setting degrade the resource itself, or degrade access to or use of the resource. Under National Historic Preservation Act, unlike under NEPA, beneficial impacts are not considered.

3.9.1.3 Environmental Consequences

Environmental Consequences of Alternative 1 (No Action)

The No Action Alternative maintains the status quo at all communication facility sites. This alternative provides a basis to compare the action alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Under this alternative, all communication sites would remain in their current state. Routine maintenance trips to the sites and operation of the communication system are not expected to have adverse effects on cultural resources. No impacts would be associated with this alternative.

Environmental Consequences of Alternative 2 (Preferred Alternative)

In general, construction and/or demolition of facilities proposed by the project will involve only slight modifications to the environment (see Chapter 2 for descriptions). Because of the minor nature of anticipated physical impacts to the ground, it is not likely that significant paleontological resources or buried human remains will be uncovered during project construction or demolition. As noted previously, the rock formations underlying areas where ground disturbing activities are proposed consist of rock formations that do not contain vertebrate fossils, and thus would not be considered paleontologically sensitive rock formations. As a result, potential impacts to such resources will not be discussed further except to note that if human remains are accidentally uncovered, the provisions of Mitigation Measure 2-Human Remains shall be followed.

Most of the individual project sites lie on lands controlled by the Federal government, i.e., Yosemite National Park, the Bureau of Land Management, or the Stanislaus National Forest. The provisions of the Raker Act conveyed control of these properties to SFPUC, and so these areas will be analyzed according to CEQA requirements. Because none of the Hetch-Hetchy project sites lie within the City or County of San Francisco, resources are not considered "local" resources.

Oakdale Area					
	NEPA				CEQA
Site	Context	Duration	Intensity	Type	Impact
Warnerville Switchyard					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	NA	NA	NA	NA	NA

Moccasin Area					
	NEPA				CEQA
Site	Context	Duration	Intensity	Type	Impact
Moccasin Peak	Local	Short-Term	Negligible	Beneficial	LSM
Moccasin Powerhouse	Local	Short-Term	Negligible	Not Adverse	LSM
Moccasin Powerhouse Passive Reflector	Local	Short-Term	Negligible	Beneficial	LSM

CEQA and NEPA Impacts:
NA = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Moccasin Area					
	NEPA				CEQA
Site	Context	Duration	Intensity	Type	Impact
Moccasin Peak					
Archaeological	Local	Short Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Moccasin Powerhouse					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	LS
Moccasin Powerhouse Passive Reflector					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	NA	NA	NA	NA	NA

CEQA and NEPA Impacts:
NA = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Oakdale and Moccasin Area

Archaeological Resources

No prehistoric or historic-era archaeological resources or Traditional Cultural Properties were identified within these project locations. Potentially significant impacts to archaeological resources would stem from ground disturbance activities that could uncover as-yet unidentified archaeological resources or buried human remains. The implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2– Human Remains, would reduce impacts on burials to a less than significant level under CEQA; impacts to human remains uncovered during project construction would remain significant under NEPA.

Architectural Resources

No historic buildings were identified in the Oakdale project area. Therefore, there would be no impacts to historic buildings as a result of the preferred alternative.

Historic buildings identified in the Moccasin project area include the old Moccasin Powerhouse. The old Moccasin Powerhouse appears eligible for the CRHR under Criteria 1 and 3. Under the preferred alternative, a new 80-foot high monopole type communication tower would be installed north of the retaining wall of the new powerhouse. Therefore, this tower is located to the south of the old Moccasin Powerhouse. The introduction of this tower would result in a less than significant impact to the old Moccasin Powerhouse as the physical characteristics of the building and its historic associations (relationship to Hetch Hetchy water system) would not be materially altered in an adverse manner. The significance of old Moccasin Powerhouse would not be materially impaired as it would retain its historic associations to the Hetch Hetchy water system. In addition, the old Moccasin Powerhouse would retain the physical characteristics that represent the Mission Revival architectural style including its parapet walls, red tile roof, and large arched openings. Therefore, there would be no significant impacts to historic buildings as a result of the preferred alternative.

Impact Determination (Oakdale and Moccasin Areas)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, no adverse effect unless human remains are adversely effected.

Yosemite National Park Sites					
	NEPA				CEQA
Site	Context	Duration	Intensity	Type	Impact
O'Shaughnessy					
O'Shaughnessy Dam Gallery					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	Local	Short-Term	Negligible	Not Adverse	LSM
O'Shaughnessy Dam Diversion Tunnel					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
O'Shaughnessy Stream Gauge					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
O'Shaughnessy Water Quality Building					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
O'Shaughnessy Chalet (Cottage 1)					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	LS
O'Shaughnessy Watershed Keeper's Office (Cottage 4)					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	LS
O'Shaughnessy Bunkhouse					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	LS
O'Shaughnessy Water Tanks					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	LS
Lake Eleanor					
Lake Eleanor Dam Level Gauge					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	LS
Lake Eleanor-Cherry Lake Tunnel					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Poopenaut Pass					
Poopenaut Pass					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A

CEQA and NEPA Impacts:
NA = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

O'Shaughnessy and Lake Eleanor Areas

Archaeological Resources

No prehistoric or historic-era archaeological resources or Traditional Cultural Properties were identified within these project locations. Potentially significant impacts to buried resources would stem from ground disturbance activities that uncovered as-yet unidentified archaeological resources or buried human remains. The implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2– Human Remains, would reduce impacts on burials to a less than significant level under CEQA; impacts to human remains uncovered during project construction would remain significant under NEPA.

Architectural Resources

O'Shaughnessy

Historic structures identified in the O'Shaughnessy project area include the O'Shaughnessy Dam (including the Stream Gauge), the O'Shaughnessy Chalet, the O'Shaughnessy Watershed Keeper's Office, the O'Shaughnessy Bunkhouse, and the O'Shaughnessy Water Tanks. Impacts to these resources are addressed below.

Under the preferred alternative, a parabolic antenna would be installed behind the middle window of the O'Shaughnessy Dam gallery. This antenna would not be visible from the outside of the dam gallery. In addition, a rigid galvanized steel conduit antenna would be installed on the structure. Since there would be no change to the structural or visual character of the Dam, the historical significance of O'Shaughnessy Dam would not be materially impaired, and the project would not have a significant impact on the O'Shaughnessy Dam.

Under the preferred alternative, communication equipment would be installed in a cabinet in the crawl space of the O'Shaughnessy Chalet. Since there would be no change to the structural or visual character of the Chalet, the historical and architectural significance of the building would not be materially impaired, and the project would not result in less than significant impact to the O'Shaughnessy Chalet.

Under the preferred alternative, communication equipment would be installed in a cabinet on the exterior of the O'Shaughnessy Watershed Keeper's Office. This cabinet would be approximately 3-feet by 3-feet and located on a side elevation to minimize its visibility. Since there would be no change to the structural or visual character of the building, the historical significance of the building would not be materially impaired, and the project would be a less than significant impact to the O'Shaughnessy Watershed Keeper's Office. The building would retain its association with O'Shaughnessy Dam and the Hetch Hetchy water system; therefore the preferred alternative would result in a less than significant impact.

Under the preferred alternative, communication equipment would be installed in a wall-mounted cabinet on the exterior of the O'Shaughnessy Bunkhouse. This 3-foot by 3-foot cabinet would be placed at the rear of the building to minimize its visibility. Since there would be no change to the structural or visual character of the building, the historical significance of the building would not be materially impaired, and the installation of this cabinet would be a less than significant impact to the O'Shaughnessy Bunkhouse.

The building would retain its association with O'Shaughnessy Dam and the Hetch Hetchy water system; therefore the preferred alternative would result in a less than significant impact.

Under the preferred alternative, communication equipment would be installed in a wall-mounted cabinet on the interior of O'Shaughnessy Water Tanks. Since there would be no change to the structural or visual character of the building, the historical significance of the building would not be materially impaired, and the installation of this cabinet would be a less than significant impact to the O'Shaughnessy Water Tanks. The water tanks would retain their association with O'Shaughnessy Dam and the Hetch Hetchy water system; therefore the preferred alternative would result in a less than significant impact.

Lake Eleanor Dam

Historic structures identified at the Lake Eleanor Sites project area include the Lake Eleanor Dam. As the first dam constructed as part of the Hetch Hetchy water system, Lake Eleanor Dam appears eligible for the CRHR under Criterion 1. Lake Eleanor Dam also appears eligible under Criterion 3 as an example of an early concrete, gravity dam and an important engineering achievement. Under the preferred alternative, a pad-mounted communication cabinet would be installed at the Lake Eleanor Dam Level Gauge. The installation of this cabinet would be a less than significant impact to Lake Eleanor Dam. The historical associations of Lake Eleanor Dam would not be materially impaired. In addition, there is currently an equipment cabinet at the Lake Eleanor Dam Level Gauge. Therefore, the addition of another cabinet of similar size and configuration would cause a less than significant impact to Lake Eleanor Dam. The dam would not be materially impaired by the project as it would continue to be associated with the Hetch Hetchy water system and it would continue to represent an important engineering achievement.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, no adverse effect unless human remains are adversely effected.

Poopenaut Pass

Archaeological Resources

There are no known archaeological resources at the Poopenaut Pass site (ART [revised by EDAW] 2007). Therefore the construction, upgrades, and operation of the project sites would have no impact on known prehistoric features, or artifacts, however, local Native American communities may attach significance to the area.

The construction of the Poopenaut Pass site would involve ground disturbance that includes the communication shelter area, tower area, access trail construction, and trenching along the access trail to install an electrical line. These activities could potentially result in disturbance of as yet unknown archaeological resources or buried human remains. The implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2– Human Remains would reduce impacts on burials to a less than significant level under CEQA; impacts to human remains uncovered during project construction would remain significant under NEPA. Physical alteration of the project vicinity may adversely affect location

qualities that are significant to local Native Americans. Implementation of Mitigation Measure 3 – Traditional Cultural Properties, would reduce impacts on these resources to a less than significant level.

Architectural Resources

No historic buildings were identified in the Poopenaut Pass site. Therefore, there would be no impacts to historic buildings as a result of the preferred alternative.

Impact Determination (Poopenaut Pass Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, no adverse effect unless human remains are adversely effected.

Stanislaus National Forest Sites					
	NEPA				CEQA
Site	Context	Duration	Intensity	Type	Impact
Cherry Lake					
Cherry Valve House					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Pump Station					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Water Tanks					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Lake Garage and Warehouse					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Lake Camphouse					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Lake Cottage #1					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Lake Cottage #2					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Lake Cottage #3					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Lake Cottage #4					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Cherry Tower Site					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Early Intake & Tuolumne River Area					
Intake Radio Site					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Intake Switchyard					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Kirkwood Powerhouse					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM

Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Holm Powerhouse					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Duckwall Mountain					
Duckwall Mountain					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Jones Point					
Jones Point					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A
Burnout Ridge					
Burnout Ridge					
Archaeological	Local	Short-Term	Negligible	Not Adverse	LSM
Paleontological	Local	Short-Term	Negligible	Not Adverse	LS
Architectural	N/A	N/A	N/A	N/A	N/A

CEQA and NEPA Impacts:
NA = Not applicable
NI = No Impact
LS = Less than Significant
LSM = Less than Significant with Mitigation Incorporated
PS = Potentially Significant

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

No archeological or architectural resources or Traditional Cultural Properties have been identified in the project area at these locations. Potentially significant project impacts to buried resources could stem from ground disturbance activities that uncover as-yet unidentified archaeological resources or buried human remains. The implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2 – Human Remains, would reduce impacts on burials to a less than significant level under CEQA; impacts to human remains uncovered during project construction would remain significant under NEPA.

Impact Determination (Existing Sites in Cherry Lake, Early Intake and Tuolumne River areas, Duckwall Mountain, and Jones Point)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, no adverse effect unless human remains are adversely effected.

Intake Radio Site

No archeological or architectural resources or Traditional Cultural Properties were identified at the Intake Radio Site. Buried sites could be uncovered during the ground disturbance activities associated with the Intake Radio Site, however because of the shallow soil base, steep slopes, and previous ground disturbance at the site, it is unlikely that archeological resources would be uncovered during project construction. Construction of Burnout Ridge shall adhere to the Forest Plan Cultural Resource Protection

(2-B) Management Practice. This management practice requires the protection of all identified cultural resources until they are evaluated.

Potentially significant project impacts to buried resources could stem from ground disturbance activities that uncover as-yet unidentified archaeological resources or buried human remains. The implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2– Human Remains, would reduce impacts on burials to a less than significant level under CEQA; impacts to human remains uncovered during project construction would remain significant under NEPA.

Impact Determination (Intake Radio Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, no adverse effect unless human remains are adversely effected.

Burnout Ridge

No archeological or architectural resources or Traditional Cultural Properties have been identified at the Burnout Ridge project site. The construction of the Burnout Ridge site would involve ground disturbance that includes the communication shelter area, tower area, access road improvements, and trenching along the access road to install an electrical line. These upgrades would be subject to the Cultural Resources Management Practices 2-A and 2-B of the Forest Plan as amended, and would have no adverse effect on the Stanislaus cultural landscape.

Potentially significant project impacts to buried resources would stem from ground disturbance activities that uncover as-yet unidentified archaeological resources or buried human remains. The implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2 – Human Remains, would reduce impacts on burials to a less than significant level under CEQA; impacts to human remains uncovered during project construction would remain significant under NEPA.

Impact Determination (Burnout Ridge)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, no adverse effect unless human remains are adversely effected.

Cherry Tower Site

The construction of Cherry Tower Site would involve ground disturbance that includes the communication shelter area, tower area, access road improvements, and trenching at the site to install an electrical line from the existing power pole. No archaeological or architectural resources or Traditional Cultural Properties were found within the Cherry Tower Site area (ART [revised by EDAW] 2007). Therefore the construction, upgrades, and operation of the project sites would have no impact on known archeological resources. However, buried or otherwise undocumented cultural resources could occur within this area and potentially be disturbed during project ground-disturbing activities.

Potentially significant project impacts to buried resources would stem from ground disturbance activities that uncover as-yet unidentified archaeological resources or buried human remains. Adherence to US Forest Service Management Practices (for USFS sites) and implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2 – Human Remains, would reduce impacts on burials to a less than significant level under CEQA; such impacts would remain significant under NEPA.

Impact Determination (Cherry Tower Site)**:**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, no adverse effect unless human remains are adversely effected.

Environmental Consequences of Alternative 3 (Poopenaut Pass Alternative Site)

Alternative 3 is the same as Alternative 2, the Preferred Alternative, except that the Poopenaut Pass site would be located north of O'Shaughnessy Dam Road, approximately 375 feet from the Poopenaut Pass site identified for Alternative 2. Potential short-term archeological impacts would be the same as those described for the Alternative 2. The CCIC research did not identify any known archeological sites at the Poopenaut Pass site, and no archeological sites were identified during the field survey (ART [revised by EDAW] 2007); however, input from local Native American sources suggests that the site may have cultural significance. No historic buildings were identified in the Poopenaut Pass project area. Therefore, there would be no impacts to historic buildings as a result of the Alternative 3. The same facilities would be constructed and installed, but at a different location. These upgrades would be subject to the 1999 Programmatic Agreement and A Sense of Place: Design Guidelines for Yosemite Valley (NPS 2005) and Cultural Resources Management Practices 2-A and 2-B of the Forest Plan as amended, and would have no adverse effect on the Yosemite and Stanislaus cultural landscape.

Adherence to US Forest Service Management Practices (for USFS sites) and implementation of Mitigation Measure 1 – Undocumented Cultural Resources, would reduce such impacts to less than significant levels. Implementation of Mitigation Measure 2 – Human Remains, would reduce impacts on burials to a less than significant level under CEQA; such impacts would remain significant under NEPA. Implementation of Mitigation Measure 3 – Traditional Cultural Properties would reduce impacts on these resources to a less than significant level.

3.9.1.4 Mitigation Measures

Mitigation Measure 1 – Undocumented Cultural Resources: The following mitigation measure is required to avoid any potential adverse effect from the proposed project on accidentally discovered buried or submerged historical resources (CEQA) or historic properties (NHPA). The SFPUC shall distribute the Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor, or utilities firm involved in soils disturbing activities within the project sites. Prior to any soils disturbing activities being undertaken each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel including, machine operators, field crew, supervisory personnel, etc. The SFPUC shall provide the Environmental Review Officer (ERO) of the San Francisco

Planning Department with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the ERO confirming that all field personnel have received copies of the Alert Sheet.

Should any indication of an archeological resource, such as unusual amounts of bone, stone, or shell, be encountered during soils disturbing activity for the project, the project Head Foreman and/or project sponsor shall immediately notify the ERO and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken.

If the ERO determines that a potentially significant archeological resource may be present within the project site, the SFPUC shall retain the services of a qualified archeological consultant. The archeological consultant shall advise the ERO as to whether the discovery is potentially significant under CEQA or NHPA. If a potentially significant resource is present, the archeological consultant shall identify and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the SFPUC.

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

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

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archeological Site Survey Central Coast Information Center (CCIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the CCIC. The Major Environmental Analysis division of the Planning Department shall receive three copies of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

Mitigation Measure 2 – Human Remains: The following mitigation measure is required to avoid any potential adverse effect from the proposed project on uncovered human remains. If human remains are encountered all project-related construction activity will halt within 50 feet of the find. If the remains are

discovered on Federal lands, the provisions of NAGPRA shall be adhered to. If the remains are uncovered on non-federally owned land, the following process shall be implemented:

In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor and/or the SFPUC shall immediately halt potentially damaging excavation in the area of the burial and notify the County Coroner and a professional archeologist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of an American Indian, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). Following the coroner's findings, the property owner, contractor or project proponent, an archeologist, and the NAHC-designated Most Likely Descendent (MLD) shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of American Indian human remains are identified in California Public Resources Code Section (PRC) 5097.9.

Upon the discovery of American Indian remains, the landowner shall ensure that the immediate vicinity (according to generally accepted cultural or archeological standards and practices) is not damaged or disturbed by further development activity until consultation with the MLD has taken place. The MLD shall have 48 hours to complete a site inspection and make recommendations after being are granted access to the site. A range of possible treatments for the remains, including nondestructive removal and analysis, preservation in place, relinquishment of the remains and associated items to the descendents, or other culturally appropriate treatment may be discussed. PRC 5097.9 suggests that the concerned parties may extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. The following is a list of site protection measures that the landowner shall employ:

(1) Record the site with the Native American Heritage Commission or the appropriate Information Center

(2) Utilize an open-space or conservation zoning designation or easement

(3) Record a document with the county in which the property is located

The landowner or their authorized representative shall rebury the American Indian human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if the NAHC is unable to identify a MLD or the MLD fails to make a recommendation within 48 hours after being granted access to the site. The landowner or their authorized representative may also re-inter the remains in a location not subject to further disturbance if they reject the recommendation of the MLD, and mediation by the NAHC fails to provide measures acceptable to the landowner. Adherence to these procedures and other provisions of the California Health and Safety Code will reduce potential impacts to human remains to a less than significant level.

Mitigation Measure 3 – Traditional Cultural Properties: Prior to construction at Poopenaut Pass, the Section 106 consultation process shall be completed. If Poopenaut Pass is determined to be a Traditional Cultural Place as defined in National Register Bulletin #38, any necessary documentation or agreements regarding amelioration of effects shall also be completed prior to construction.

3.9.1.5 Impairment

The Proposed Action is subject to the 1999 Programmatic Agreement (National Park Service) or compliance with Cultural Resources Management Practice 2-A and 2-B in the Forest Plan, as amended. The Proposed Action would not impair park resources for future generations.

3.9.1.6 Cumulative Impacts

Cumulative effects on cultural resources are based on analysis of projects in the Hetch Hetchy Communication System Upgrade project area. Future projects could have a potentially adverse impact on cultural resources, but could be mitigated to have no adverse effect by implementing the 1999 Programmatic Agreement (National Park Service) or compliance with Cultural Resources Management Practices in the Forest Plan, as amended (USFS). Therefore, future projects are expected to have no adverse cumulative effect on cultural resources.

3.9.1.7 Conclusions Statement

Impacts on cultural resources are summarized below:

Oakdale, Moccasin Areas, O'Shaughnessy, Lake Eleanor, Poopenaut Pass, Existing Sites in Cherry Lake, Early Intake and Tuolumne River areas, Duckwall Mountain, and Jones Point, Intake Radio Site, Burnout Ridge, Cherry Tower Site

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, not adverse impact unless human remains are adversely affected.

3.10 SOCIAL RESOURCES

The analysis of social resources includes Land use/Relationship to other plans, Scenic Resources, Visitor Experience and Recreation, and Transportation.

3.10.1 Land Use/Relationship to Other Plans

This section describes the existing land use setting of the Hetch Hetchy Communication System Upgrade project site areas.

3.10.1.1 Affected Environment

A description of the existing conditions of the site areas is described in Section 3.5. The following describes the existing guiding plans followed by land use designations at each of the sites.

City and County of San Francisco

Raker Act

The Raker Act was passed by the US Congress in 1913, which granted the City and County of San Francisco certain rights of way in, over and through certain public lands, which includes Yosemite National Park and Stanislaus National Forest. The Raker Act right-of-way's purpose is to allow for the construction, operation, and maintenance of aqueducts, canals, ditches, pipes, pipelines, flumes, tunnels, and conduits for conveying water for domestic purposes and uses to the City and County of San Francisco (see Section 1.9.3, Planning Context for additional detail.)

City Plans Guide Management of Extraterritorial Lands

The SFPUC has authority under the San Francisco City Charter, Section 4.112, over the management, use, and control of extraterritorial lands, which are properties outside the City that the City owns, leases, or over which it holds easements. San Francisco's General Plan and its building and zoning ordinances, to the extent they are applicable to these extraterritorial lands and are not in conflict with Section 4.112 of the City Charter, would apply to the Proposed Action on lands outside the City (see Section 1.9.3, Planning Context for additional detail.)

National Park Service

The management and implementation plans adopted by Yosemite National Park that are relevant to the Lake Eleanor, Poopenaut Pass, and O'Shaughnessy areas are described below.

Yosemite National Park General Management Plan

The Organic Act of 1916 establishes the National Park Service within the US Department of the Interior and defines its purpose as the management and protection of national parks, monuments, and reservations; the Organic Act gives the National Park Service the authority to regulate and manage land use planning within the Yosemite National Park. The primary policy plan that guides the National Park Service in protecting and managing the park is the Yosemite National Park General Management Plan (Yosemite Management Plan), which was adopted in 1980.

This long-range plan for the entire park is outlined in five broad goals:

- reclaim priceless natural beauty
- reduce traffic congestion
- allow natural processes to prevail
- reduce crowding
- promote visitor understanding and enjoyment

The administrative actions to achieve these goals are defined by the management objectives in the document. The plan also includes four primary land management zones, which are (1) Natural Zone (Natural Environment Subzone), (2) Cultural Zone, (3) Development Zone, and (4) Special-Use Zone (Reservoir Subzone). The Lake Eleanor sites are located within the Reservoir Subzone, the Poopenaut

Pass and O'Shaughnessy sites are located in Natural Environment Subzone. The description of each subzone is as follows:

- **Natural Environment Subzone**: Roads, picnicking areas, and trailheads are permitted in this subzone, but development will be minimal.
- **Reservoir Subzone**: The reservoirs which comprise this subzone are managed by the San Francisco Water Department under terms of the Raker Act.

The Yosemite Management Plan includes Developed Area Plans that describe actions considered necessary and desirable to achieve the overall management goals for Yosemite National Park. The Lake Eleanor and O'Shaughnessy sites are located in the Mather District Area Plan. Consistency with the applicable management objectives is contained in Table 3.10.1-2.

Resource Management Plan

The Resource Management Plan's (RMP) purpose is to interpret law and policies relating to the administration of the National Park System and to define and provide management direction for an integrated program of natural and cultural resources management in the park (NPS 1993). Consistency with the applicable management objectives is contained in Table 3.10.1-2.

US Forest Service

The management and implementation plans adopted by Stanislaus National Forest that are relevant to the Duckwall Mountain, Early Intake, Tuolumne River, Cherry Lake, and Burnout Ridge areas are described below.

Forest Plan Direction July 2005

The Forest Plan Direction July 2005 (Forest Plan, as amended) is the current Forest Plan management direction, based on the original Forest Plan prepared in 1991 as modified through the Forest Plan appeals process and amendments. The management direction components are comprised of: forest goals, management goals and strategies, forest objectives, management practices, forest-wide standards and guidelines, management area direction, and land allocation direction. The Stanislaus National Forest has been divided into Management Areas based on their predominant management emphasis. Each Management Area has a management emphasis statement, description of the physical area, and a management prescription which describes specific practices, activities, Standards and Guidelines applicable to that Management Area (USDA 2005). All Forest-wide Standards and Guidelines also apply within each Management Area (USDA 2005).

Project Site Land Uses

Oakdale Area

Warnerville Switchyard. The Warnerville Switchyard is located within Stanislaus County off of Warnerville Road southeast of the City of Oakdale. This site is designated "Agricultural" land use in the Stanislaus County General Plan, and is surrounded by farmland primarily used for grazing (Stanislaus County 1994). Warnerville Switchyard is within the Raker Act right-of-way.

Moccasin Area

Moccasin Peak. Moccasin Peak is located within forested land in Tuolumne County, north of the Hetch Hetchy aqueduct, within the Sierra Nevada foothills, near the intersection of Highways 120 and 49, with Bureau of Land Management lands located north and south of the site. The site is designated "Agricultural" land use in the Tuolumne County General Plan (Tuolumne County 2006). Moccasin Peak is within the Raker Act right-of-way.

Moccasin Powerhouse. The Moccasin Powerhouse site is located in Tuolumne County, east of the Moccasin Reservoir, with Bureau of Land Management lands immediately southwest of the site. The site is designated "Public" land use in the Tuolumne County General Plan (Tuolumne County 2006). Moccasin Powerhouse is within the Raker Act right-of-way.

Moccasin Powerhouse Passive Reflector. The Moccasin Powerhouse Passive Reflector site is located within forested BLM lands adjacent to Tuolumne County lands to the southwest of the site. The site is designated "Public" land use in the Tuolumne County General Plan (Tuolumne County 2006). The Moccasin Powerhouse Passive Reflector is within the Raker Act right-of-way.

Lake Eleanor Sites. The Lake Eleanor Sites are all located within Yosemite National Park, on the western boundary of Lake Eleanor. Lake Eleanor is located to the east of Cherry Lake, just inside the Yosemite National Park. These sites are both located within the Reservoir Subzone as identified in the Yosemite General Management Plan. The Lake Eleanor sites are within the Raker Act right-of-way.

O'Shaughnessy Dam Sites. The O'Shaughnessy Dam Sites are all located within Yosemite National Park to the west and south of the Hetch Hetchy reservoir. These sites are all located within the Natural Environment Subzone area as identified in the Yosemite General Management Plan. The O'Shaughnessy Dam sites are within the Raker Act right-of-way.

Poopenaut Pass. Poopenaut Pass is located in Yosemite National Park between the Hetch Hetchy Entrance Station and O'Shaughnessy Dam, approximately four miles southwest of the Hetch Hetchy Reservoir. This site is located within the Natural Environment Subzone as identified in the Yosemite General Management Plan. This site is not located within the Raker Act right-of-way and is therefore subject to National Park Service action.

Early Intake & Tuolumne River Area

Intake Radio Site. The Intake Radio Site is located above a developed switchyard site northwest of the Hetch Hetchy Aqueduct Tunnel. The site is located along an existing transmission line above Intake Switchyard on the route between Intake Switchyard and Moccasin Powerhouse, and currently houses a voice radio repeater and a 900 MHz spread spectrum SCADA radio. This site is located within a Scenic Corridor Management area of the Forest Plan (USDA 1991). Intake Radio Site is within the Raker Act right-of-way.

Intake Switchyard. The Intake Radio Site is located on a developed switchyard site south of the Tuolumne River. This site is located within a Developed Sites Management area of the Forest Plan (USDA 1991). Intake Switchyard is within the Raker Act right-of-way.

Holm Powerhouse. The Holm Powerhouse is located north of the Tuolumne River and along Cherry Creek. Cherry Creek runs past the south end of Holm Powerhouse and is a popular whitewater rafting area. The Upper or Cherry Creek Run is a popular whitewater boating area (USDA 1988). This site is located within a Developed Sites Management area of the Forest Plan (USDA 1991). Holm Powerhouse is within the Raker Act right-of-way.

Kirkwood Powerhouse. The Kirkwood Powerhouse is located north of the Tuolumne River. The Kirkwood Powerhouse is surrounded by a parking lot to the northeast, access road to the north, and HHW&P housing to the west. The Tuolumne River runs along the southern portion of the powerhouse. This site is located within a Developed Sites Management area of the Forest Plan (USDA 1991). Kirkwood Powerhouse is located within the Raker Act right-of-way.

Cherry Lake Sites

The Cherry Lake Sites are all located within the Stanislaus National Forest, south and southeast of Cherry Lake. Cherry Lake is located approximately three miles north of Burnout Ridge and approximately eight miles west of the Hetch Hetchy Reservoir. It is accessed from within the project site by Cherry Lake Road, a paved road that intersects just west of the lake with National Forest Route 14, a paved road that leads west to Sonora. These sites are located within a Developed Sites Management area of the Forest Plan (USDA 1991).

Duckwall Mountain and Jones Point. Microwave equipment at Duckwall Mountain and Jones Point, two existing developed sites, would be removed for the proposed project. These sites each contain a repeater, HHW&P equipment, antennas, and antenna feed system. Duckwall Mountain and Jones Point are located in the Stanislaus National Forest and are currently accessed by an existing road. Duckwall Mountain is located within a General Forest Management area and Jones Point is located within a Scenic Corridor Management area of the Forest Plan (USDA 1991).

The proposed project sites in Stanislaus National Forest fall within the Management Areas shown in Table 3.10.1-1 below.

Table 3.10.1-1
Stanislaus National Forest Management Area Descriptions by Project Sites

Project Sites	Management Area
• Cherry Tower Site • Cherry Valve House • Burnout Ridge	**Wildlife**: This area emphasizes late seral state management indicator species (MIS) and all other wildlife which require mature and older forest habitats for part or all of their life cycle. MIS used to prescribe management direction are spotted owl, fisher and marten which are all designated sensitive species. A variety of semi-primitive motorized recreation opportunities are also provided.
• Cherry Water Tanks • Cherry Lake Garage and Warehouse • Cherry Lake Camphouse • Cherry Lake Cottages 1-4	**Developed Recreation Sites**: Provide developed recreation opportunities for the public including: picnic areas, campgrounds, parking areas, boat ramps, visitor information centers, vistas and overlooks, resorts, organization camps and recreation residences. Maintain facilities for the convenience of the user. Protect or improve the natural forest setting surrounding these facilities. Provide future developed recreation opportunities for the public. Meet increasing demand by setting up an inventory of developable areas and preserving site qualities that make them desirable

	for recreation use.
• Holm Powerhouse • Intake Switchyard • Kirkwood Powerhouse	**Developed (Non-Recreation) Sites**: Management emphasis for these areas is to provide sites necessary for the administration and special uses of the National Forest. Forest resources will be managed to meet administrative objectives. Buildings and facilities will be designed to be compatible with the surrounding landscape, energy efficient, and functionally suitable for both employees and the visiting public. These areas will be managed to maintain compatibility between users and forest resources to reduce impacts on the surrounding environment. New utility sites and new uses proposed at existing sites will be evaluated individually for compatibility with the existing uses and all environmental concerns associated with the proposal.
• Burnout Ridge access road	**General Forest:** These areas will be managed for wood, water, fish and wildlife, recreation, and range. This includes intensive timber management while providing for wildlife values, dispersed motorized recreation, off-highway vehicle use, and mountain bicycle opportunities. Extensive range management will be employed. Critical deer winter ranges will be protected and enhanced. There will be prescribed burning.
• Intake Radio Site • Cherry Pump Station	**Scenic Corridor:** Emphasize the scenic and recreation values of major trail, road and highway corridors, developed recreation sites, major rivers and lakes, and other areas of concentrated recreation use.

Consistency with the applicable management practices, general direction, standards and guidelines are contained in Table 3.10.1-2.

3.10.1.2 Thresholds of Significance

CEQA Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for impacts related to land use, but considers that implementation of the proposed project would have a significant impact if it were to:

- Physically divide an established community;
- Conflict with applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or
- Have a substantial impact on the existing character of the vicinity.

NEPA Thresholds (National Park Service/US Forest Service Sites)

Based on the National Park Service Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-making and its accompanying Handbook (NPS 2001), significant land use and planning impacts would occur if the project would have measurable effects on physical, natural, or cultural resources as they relate to the following:

- land use (e.g., occupancy, income, values, ownership, type of use);

- other agency or tribal land use plans or policies;
- urban quality, gateway communities; and,
- long-term management of resources or land/resource productivity.

The following guidelines were used to identify the context, duration, intensity (or magnitude) and type of impact (NPS 2000).

Context of Impact

The context considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within the immediate vicinity of the Proposed Action, unless otherwise noted.

Duration of Impact

The duration of an impact is noted as either short-term or long-term and defined in a range of years.

Intensity of Impact

The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts were effects considered not detectable and that would have no discernible effect on land use patterns or land use compatibility. Minor impacts were effects on land use patterns that would be slightly detectable but would not be expected to have an overall effect on those conditions. Moderate impacts would be clearly detectable and could have an appreciable effect on land use patterns or result in land use incompatibility. Major impacts would have a substantial, highly noticeable land use incompatibility or would result in substantial changes to land use patterns.

Type of Impact

The type of impact refers to whether the effect is considered beneficial or adverse. Beneficial impacts would improve resource conditions. Adverse impacts would deplete or negatively alter resources.

3.10.1.3 Environmental Consequences

Environmental Consequences of Alternative 1 (No Action)

The Hetch Hetchy Communication System would continue to operate as it currently does under Alternative 1. The Cherry Tower Site, Poopenaut Pass, and Burnout Ridge sites would not be developed and the system would continue to operate on the 2 GHz band. In addition, an amendment to the Forest Plan for Burnout Ridge and a right-of-way permit for Poopenaut Pass would not be needed. There would continue to be a need for a foundation system to updated and improved communication systems for HHW&P, the National Park Service, and the US Forest Service. No changes or impacts to land use would occur.

Environmental Consequences of Alternative 2 (Preferred Alternative)

None of the project alternatives would physically divide an established community, as the project sites are located in remote areas and are not adjacent to (with the exception of Warnerville Switchyard and

Moccasin Powerhouse), or surrounded by existing residential or community uses. Thus, this issue is not discussed further in this analysis.

Oakdale Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Warnerville Switchyard	WSY	N/A	N/A	N/A	N/A	NI

Moccasin Area						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Moccasin Peak	MPK	N/A	N/A	N/A	N/A	NI
Moccasin Powerhouse	MPH	N/A	N/A	N/A	N/A	NI
Moccasin Powerhouse Passive Reflector	MPR	N/A	N/A	N/A	N/A	NI
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Oakdale and Moccasin Area Sites

The proposed upgrades at each of the sites would not physically divide an established community, nor would land uses at each of the sites change. Warnerville Switchyard and Moccasin Powerhouse are the only sites in close proximity to existing residences. However, these are existing sites and the proposed upgrades would not result in physically dividing the adjacent residential areas. Moccasin Peak and Moccasin Powerhouse Passive Reflector are located in remote areas, away from established communities. All project-related upgrades would occur within each of the sites' developed areas. No impacts to existing communities would occur.

Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse would continue to operate in their current capacity as part of the Hetch Hetchy Communication system. The existing land uses would be retained and no new uses would be introduced by the proposed upgrades. Upgrades at each of these sites are consistent with the existing uses and would not substantially impact the existing character of the vicinity. Thus, the proposed upgrades would not conflict with any applicable land use plans, policies, or regulations of an agency with jurisdiction over the project. The Moccasin Powerhouse Passive Reflector would no longer be part of the communication system after the passive reflector is removed; however this would not alter the character of the site or surrounding area. This site would not be used after the passive reflector is removed. No land use impacts or impacts to the existing character of the sites' vicinity would occur as a result. The upgrades proposed at Warnerville Switchyard, Moccasin Peak, and Moccasin Powerhouse and the removal of the passive reflector at the Moccasin Powerhouse Passive Reflector would not change the land use at the site such that it would be incompatible with surrounding areas. All of the sites, with the exception of Moccasin Powerhouse Passive Reflector that would be removed, would continue to operate as part of the communication system; therefore, no changes to land use would occur.

Impact Determination (Oakdale and Moccasin Areas**):**

CEQA: No impact.

NEPA: No impact.

Yosemite National Park Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
O'Shaughnessy						
O'Shaughnessy Dam Gallery	ODG	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Dam Diversion Tunnel	ODT	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Stream Gauge	OSG	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Water Quality Building	OWQ	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Chalet (Cottage 1)	OC1	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Watershed Keeper's Office (Cottage 4)	OC4	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Bunkhouse	OBH	N/A	N/A	N/A	N/A	NI
O'Shaughnessy Water Tanks	OWT	N/A	N/A	N/A	N/A	NI
Lake Eleanor						
Lake Eleanor Dam Level Gauge	EDS	N/A	N/A	N/A	N/A	NI
Lake Eleanor-Cherry Lake Tunnel	ECT	N/A	N/A	N/A	N/A	NI
Poopenaut Pass						
Poopenaut Pass	PPP	Local	Short-Term	Negligible	Adverse	LSM
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

O'Shaughnessy and Lake Eleanor Areas

The Proposed Action, as described in Section 1.0 for each of the existing sites within Yosemite National Park, would occur within the existing developed areas. The proposed project upgrades at each of the sites are consistent with the existing uses and would not impact the existing character of the vicinity. The O'Shaughnessy and Lake Eleanor sites would continue to operate as part of the communication system and the proposed upgrades at each of the sites would not change the existing land use.

Impact Determination (O'Shaughnessy and Lake Eleanor Areas**):**

CEQA: No impact.

NEPA: No Impact.

Poopenaut Pass

The Poopenaut Pass site would be a new site within Yosemite National Park. The construction of this new site would involve construction of a trail, a new communication tower, and a new communication shelter in an undeveloped area. The construction of the new site would constitute a minimal development, which is in agreement with the Natural Environment Subzone. In addition, it falls within the Raker Act right-of-way, which allows for the City and County of San Francisco, through the SFPUC, to develop facilities for purposes of constructing, operating and maintaining facilities to support its water system.

Although not located within the Wilderness Area, the Poopenaut Pass site is located in close proximity to designated wilderness area. The Yosemite wilderness is managed by the National Park Service to maintain or enhance the current state of natural conditions and balance, to prevent further degradation of

conditions, and to restore areas already degraded (NPS 1989). The construction of the new site would change the existing character of the area; however, project operation would not result in an incompatible use at the site, nor would it result in increased visitors or use of the area. Access to the site would be limited to maintenance personnel and the operation of the communication site would be passive in nature. Construction of the site may have potentially significant short-term impacts due to the proximity to the wilderness area. Natural systems and processes will be permitted to follow their courses with minimum intrusion by man (NPS 1989). The wilderness area is managed to limit the number of visitors such that the natural environment is not significantly affected. Due to the proximity of the Poopenaut Pass site to the wilderness area, Mitigation Measure 1 – Land Use, limiting the Poopenaut Pass site staging area to the H2 turnout area to the extent feasible, shall be implemented to reduce construction-related impacts between the project site and wilderness area. Impacts to land use would be less than significant with mitigation incorporated under CEQA; local, short-term, negligible, adverse under NEPA. Table 3.10.1-2 below shows the consistency of the Poopenaut Pass site with the Yosemite National Park Management Objectives.

Table 3.10.1-2
Consistency with Policies in Yosemite National Park Management Plan

Goals, Policies, Criteria, etc,	Consistency	Project Analysis
Yosemite General Management Plan		
Resource Management		
Restore altered ecosystems as nearly as possible to conditions they would be in today had natural ecological processes not been disturbed	Yes, with mitigation	Appropriate pre-construction mitigation measures would be implemented, where deemed necessary, to minimize impacts to endangered plant and animal species.
Protect threatened and endangered plant and animal special and reintroduce, where practical, those species eliminated from the natural ecosystems	Yes, with mitigation	Appropriate pre-construction mitigation measures would be implemented, where deemed necessary, to minimize impacts to endangered plant and animal species.
Permit only those types and levels of use or development that do not significantly impair park natural resources, and direct development and use to environments least vulnerable to deterioration	Yes, with mitigation	Appropriate pre- and post- construction mitigation measures would be implemented, where deemed necessary to minimize development impacts.
Limit unnatural sources of air, noise, visual, and water pollution to the greatest degree possible	Yes, with mitigation	Implementation of Mitigation Measure 1 – Visual, Mitigation Measures 1 and 2 – Noise, compliance with applicable air quality regulations for the Poopenaut Pass site would reduce air quality, noise, and visual impacts to the greatest extent feasible.
Identify the major scenic resources and the places from which they are viewed	Yes	Scenic resources are identified and potential impacts to such resources are analyzed in Section 3.10.2 Visual/Scenic Resources.
Park Operations		
Locate facilities to minimize exposure to natural hazards such as rock slides, flooding, avalanche, and hazard trees	Yes	The proposed Poopenaut Pass site has been surveyed to determine the safest siting.

Table 3.10.1-2
Consistency with Policies in Yosemite National Park Management Plan

Goals, Policies, Criteria, etc,	Consistency	Project Analysis
Provide facilities and utility systems that conserve energy and comply with all applicable standards and codes	Yes	The proposed Poopenaut Pass site would comply with existing codes and regulations.
Resources Management Plan for Yosemite National Park (Approved 1993)		
Air Quality		
Outline and appropriately implement reasonable and prudent options for the protection and maintenance of the park's Class I air quality standards from internal and external threats.	Yes.	Compliance with applicable air quality regulations would reduce air quality impacts to the greatest extent feasible.
Protect human health and air quality related values such as visibility, water quality, and biological resources.	Yes.	Compliance with applicable air quality regulations would reduce air quality impacts to the greatest extent feasible.
Prevent further deterioration in air quality and strive to remedy any existing impacts to air quality related values from internal and external sources.	Yes.	Compliance with applicable air quality regulations would reduce air quality impacts to the greatest extent feasible.
Water Quality		
All park mitigation shall be prepared to mitigate minor accidental releases of contaminants that can threaten water quality, should there be a release during normal mitigation. Prevention of accidents is preferable to cleanup, but timely cleanup of minor spills is preferable to long-term remediation of contaminated ground water.	Yes, with mitigation	Implementation of Mitigation Measures 1, 2, and 3 - Hydrology would reduce water quality impacts to the greatest extent feasible.
Wild and Scenic Rivers, Merced and Tuolumne Rivers		
Assure that mitigation of the park are consistent with the legislative intent of the Wild and Scenic Rivers Act.	Yes.	Project consistency with the Wild and Scenic Rivers Act is analyzed in Section 5.0 and Appendix C.
Hetch Hetchy and Wawona Water Systems		
Assess all human impacts to the water systems to assure that water quality meets drinking water standards.	Yes.	The construction contractor would be required to prepare a SWPPP and implement BMPs to control contaminated runoff.
Assure that water systems do not adversely impact the aquatic ecosystems.	Yes.	Post-construction BMPs would be implemented as appropriate to minimize long-term water quality effects.
Geologic Hazards		
Avoid placement of facilities and alignment of roads and trails in known areas of high hazard due to rockfalls, mud and debris flows, and in hazard zones.	Yes.	A geotechnical study has been prepared for the new project sites.
Threatened, Endangered and Sensitive Plants		
Ensure the protection of native plant species, gene pool integrity and genetic diversity.	Yes, with mitigation.	Appropriate pre-construction mitigation measures would be implemented, where deemed necessary, to minimize impacts to native plant species.

Table 3.10.1-2
Consistency with Policies in Yosemite National Park Management Plan

Goals, Policies, Criteria, etc,	Consistency	Project Analysis
Protect identified TES plant species, their habitats and potential habitats within the park.	Yes, with mitigation.	Appropriate pre-construction mitigation measures would be implemented, where deemed necessary, to minimize impacts to TES plant species.
Ecological Restoration		
Respect the natural processes, adopt the management goal to always work with instead of against natural ecological processes.	Yes.	Appropriate pre-construction mitigation measures would be implemented, where deemed necessary, to minimize impacts to the ecological system.
Restore natural conditions and ecological processes to impacted and degraded areas through restoring natural contours of topography, native soils and vegetation approaching, as near as possible, a self-sustaining dynamic ecosystem.	Yes, with mitigation.	Appropriate pre-construction mitigation measures would be implemented, where deemed necessary, to minimize impacts to the ecological system.
Vista Management		
Implement vista management activities for the preservation of historic and scenic vistas.	Yes, with mitigation.	Implementation of Mitigation Measure 1 – Visual would protect historic and scenic vistas.
Habitat Management		
Manage park habitat to protect and restore natural abundances, distributions, diversity, and behavior of park wildlife species. Modify park mitigation and visitor use to protect habitats found to be critical to threatened, endangered, and sensitive animal species.	Yes, with mitigation.	Potential impacts to these resource areas have been addressed in Section 3.0 and mitigation measures identified.
Threatened, Endangered, and Sensitive Animal (TES) Species		
Protect endangered, threatened, and sensitive animal species, their habitats and potential habitats within the park. Implement closures of park areas where human activity is shown to be adversely affecting TES species.	Yes, with mitigation.	A biological survey has been conducted for the proposed project and potential impacts to TES species have been analyzed. Mitigation measures are included to address potential impacts to TES species in Section 3.0.
Cultural Environment		
Prior to development activities on a site, compile and synthesize data from all past work, and assess relative significance of site components, in a manner that supports making management decisions consistent with other objectives.	Yes	A cultural resources survey has been conducted for the proposed project.
Identify and evaluate resources within project's area of potential effect (Section 106, NHPA)	Yes	A cultural resources survey has been conducted for the proposed project. This document analyzes the potential impacts of the project in the area of potential effect.

Impact Determination (Poopenaut Pass**):**

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, adverse impact.

Stanislaus National Forest Sites						
		NEPA				CEQA
Site		Context	Duration	Intensity	Type	Impact
Cherry Lake						
Cherry Valve House	CVH	N/A	N/A	N/A	N/A	NI
Cherry Pump Station	CPS	N/A	N/A	N/A	N/A	NI
Cherry Water Tanks	CWT	N/A	N/A	N/A	N/A	NI
Cherry Lake Garage and Warehouse	CGW	N/A	N/A	N/A	N/A	NI
Cherry Lake Camphouse	CCH	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #1	CC1	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #2	CC2	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #3	CC3	N/A	N/A	N/A	N/A	NI
Cherry Lake Cottage #4	CC4	N/A	N/A	N/A	N/A	NI
Cherry Tower Site	CTS	Local	Short-Term	Negligible	Adverse	LS
Early Intake & Tuolumne River Area						
Intake Radio Site	IRS	Local	Short-Term	Negligible	Adverse	LS
Intake Switchyard	ISY	N/A	N/A	N/A	N/A	NI
Kirkwood Powerhouse	KPH	N/A	N/A	N/A	N/A	NI
Holm Powerhouse	HPH	N/A	N/A	N/A	N/A	NI
Duckwall Mountain						
Duckwall Mountain	DWM	N/A	N/A	N/A	N/A	NI
Jones Point						
Jones Point	JPT	N/A	N/A	N/A	N/A	NI
Burnout Ridge						
Burnout Ridge	BOR	Local	Short-Term	Negligible	Adverse	LS
CEQA and NEPA Impacts: N/A = Not applicable NI = No Impact LS = Less than Significant LSM = Less than Significant with Mitigation Incorporated PS = Potentially Significant						

Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas

The proposed upgrades at the existing sites in Cherry Lake, Early Intake & Tuolumne River, and Duckwall Mountain areas would be local in context, short-term in duration, negligible in intensity, and beneficial in type. With the exception of Burnout Ridge and Cherry Tower Site, the Proposed Action would occur within developed areas and would not adversely affect the existing land use. The Cherry Lake sites (not including Cherry Tower Site), Intake Switchyard, Holm Powerhouse, Kirkwood Powerhouse, and Intake Radio Site would continue to operate as part of the communication system. Therefore, the proposed upgrades at each of the sites would not change the existing land use.

Impact Determination (Existing Sites in Cherry Lake, Early Intake & Tuolumne River, Duckwall Mountain, and Jones Point Areas)**:**

CEQA: No impact.

NEPA: No Impact.

Cherry Tower Site and Burnout Ridge (New Sites within Stanislaus National Forest)

As the Forest Plan (as amended) currently stands, project activities at the proposed Burnout Ridge site would not be consistent with the Management Area that it is located within. However, under the Special Use Management Non-Recreation (8-C) Land Management Practices in the Forest Plan, as amended, the USFS would consider the new site, which is outside of the Raker Act right-of-way, and would fulfill the objectives for the proposed communication use. The Burnout Ridge site was selected because it: 1) has a line of sight to Cherry Tower Site, Lake Eleanor Dam Level Gauge, Intake Radio Site, Intake Switchyard, and Moccasin Peak; 2) Easy access from Cherry Lake Road; and, 3) Reasonably close to an existing HHW&P electrical distribution line to support the site (Timberline 2004). The Burnout Ridge site meets all the necessary criteria for meeting the communication needs of the Cherry Lake and Lake Eleanor areas while also providing a link between Moccasin Powerhouse and Intake Switchyard. Therefore, because the new site is not covered in the current Forest Plan, the US Forest Service's Proposed Action includes an amendment to the Forest Plan in order to permit the establishment of Burnout Ridge as a new communication site. Table 3.10.1-3 below shows the consistency of the new sites with the Forestwide Standards and Guidelines.

Table 3.10.1-3
Consistency with Forestwide Standards and Guidelines

Management Practice	General Direction	Consistency	Project Analysis
Special Use Management – Non-Recreation (8-C)	Review and process applications and administer authorizations for non-recreation special uses.	Yes – with amendment to Forest Plan.	Consider the long-term effects of encumbering National Forest and prior to issuance of all authorizations. Do not grant authorizations for uses which are incompatible with the purposes for which the National Forest was created. Avoid authorizations which legitimize unauthorized uses of the National Forest such as trespasses involving physical improvements, livestock and encroachments when other remedies are available to terminate or control such use. Authorizations for new electronic sites will be considered only when the proposed improvements are incompatible with existing uses of approved sites or the location of existing approved sites cannot fulfill the objectives for the proposed communication usage. Authorizations for linear uses such as power lines and telephone lines will comply with appropriate requirements for burial and will be issued whenever possible as amendments to master permits to major utility companies. Authorizations will not be granted to individual landowners for such installations. Special Use Permits for access to private land parcels may only be issued to individual landowners or homeowners associations when it is determined through an environmental assessment that National Forest land is the only feasible access route and issuance of a right-of-way grant to a public road agency is not appropriate.

Impact Determination (Cherry Tower Site and Burnout Ridge)**:**

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse impact.

Environmental Consequences of Alternative 3 (Poopenaut Pass Site 7)

Alternative 3 is similar to the Alternative 2, with the exception of the Poopenaut Pass site located north of O'Shaughnessy Dam Road. Under this alternative, upgrades at all of the sites would still occur, with the exception of the Poopenaut Pass being located north of the Alternative 2 (Site 9) location.

3.10.1.4 Mitigation Measures

Mitigation Measure 1 – Land Use – The SFPUC shall limit the Poopenaut Pass site staging area to the H2 turnout area to the extent feasible. The wilderness boundary shall be clearly marked adjacent to the project site and no construction equipment or personnel shall be allowed past the boundary to preserve the wilderness area.

3.10.1.5 Cumulative Impacts

The proposed project would not introduce incompatible land uses in Yosemite National Park or Stanislaus National Forest. The project would amend the Forest Plan as amended, such that Burnout Ridge can be developed with the approval of a special use permit. Other developments of this nature have not been proposed in Yosemite National Park or Stanislaus National Forest, and therefore would not cause any significant cumulative land use impacts.

3.10.1.6 Conclusion Statement

Impacts to land use are summarized below.

Warnerville Switchyard, all Moccasin sites, O'Shaughnessy sites, Lake Eleanor sites, Cherry Lake Sites (not including Cherry Tower Site), Early Intake and Tuolumne River Area, and Duckwall Mountain:

CEQA: No impact.

NEPA: No impact.

Poopenaut Pass:

CEQA: Less than significant with mitigation incorporated.

NEPA: Local, short-term, negligible, adverse.

Cherry Tower Site and Burnout Ridge:

CEQA: Less than significant.

NEPA: Local, short-term, negligible, adverse.