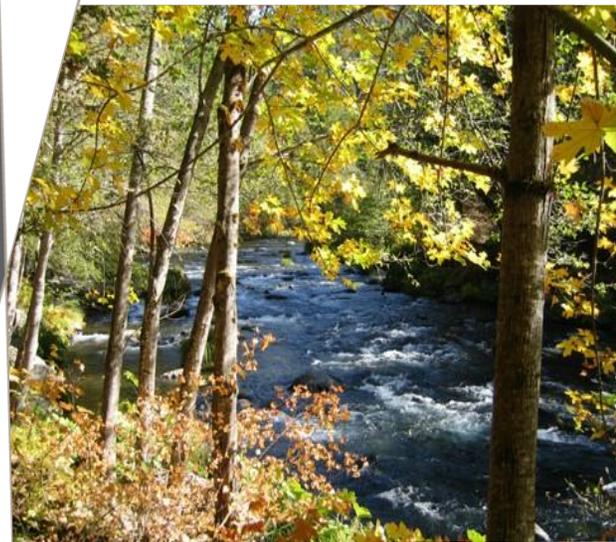


PG&E McCloud-Pit Hydroelectric Project

State Water Resources Control Board
Water Quality Certification

Draft Initial Study / Negative Declaration

FERC Project No. 2106



Document Information

Prepared for: State Water Resources Control Board—Division of Water Rights

Project Name: PG&E McCloud-Pit Hydroelectric Project

Water Quality Certification
Draft Initial Study / Negative Declaration
FERC Project No. 2106

Date: May 2019

Prepared for:



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Table of Contents

Executive Summary	i
1 Introduction	1-1
1.1 Background	1-1
1.2 Use of FERC's EIS.....	1-4
1.3 Additional Environmental Analysis Required Under CEQA.....	1-4
1.4 Agency Participation and Application	1-5
1.5 Public Review Process.....	1-9
2 Project Description	2-1
2.1 Overview	2-1
2.2 Existing Project	2-3
2.3 Existing Project Facilities.....	2-3
2.3.1 James B. Black Development	2-3
2.3.2 Pit 6 Development	2-5
2.3.3 Pit 7 Development	2-6
2.3.4 Routine Operations and Maintenance.....	2-6
2.3.5 Existing Recreation Facilities	2-13
2.3.6 Existing Recreation Facilities Routine Operations and Maintenance..	2-18
2.3.7 Project Safety	2-18
2.3.8 Existing Environmental Measures.....	2-19
2.4 Proposed Project.....	2-19
2.4.1 Project Purpose and Objectives.....	2-20
2.4.2 Proposed Project Boundary	2-21
2.4.3 Proposed Recreation Facilities	2-21
2.4.4 Proposed Recreation Facility Operations and Maintenance.....	2-31
2.4.5 Proposed Minimum Instream Flows	2-31
2.4.6 Required Environmental Management and Monitoring Plans Under the Proposed Project	2-35
2.4.7 Proposed Project Schedule	2-47
3 Environmental Checklist.....	3-1
3.1 Introduction	3-1
3.2 Evaluation of Environmental Impacts	3-1
3.2.1 Aesthetics.....	3-3
3.2.2 Agricultural and Forest Resources.....	3-13
3.2.3 Air Quality.....	3-17

3.2.4	Biological Resources	3-23
3.2.5	Cultural Resources	3-89
3.2.6	Energy	3-95
3.2.7	Geology and Soils	3-99
3.2.8	Greenhouse Gas Emissions	3-111
3.2.9	Hazards and Hazardous Materials	3-115
3.2.10	Hydrology and Water Quality	3-121
3.2.11	Land Use and Planning	3-133
3.2.12	Mineral Resources.....	3-135
3.2.13	Noise	3-137
3.2.14	Population and Housing.....	3-141
3.2.15	Public Services	3-143
3.2.16	Recreation	3-147
3.2.17	Transportation	3-157
3.2.18	Tribal Cultural Resources	3-163
3.2.19	Utilities and Service Systems.....	3-167
3.2.20	Wildfire	3-173
3.2.21	Mandatory Findings of Significance	3-179
4	References.....	4-1

Appendices

Appendix A	Notice of Section 15063(g) Informal Consultation with Responsible and Trustee Agencies
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Tables

Table 1-1	Overview of Potential Future Permit Approval and Consultation Requirements for the PG&E McCloud-Pit Hydroelectric Relicensing Project	1-6
Table 2-1	Routine Operations and Maintenance Practices for Existing McCloud-Pit Project Infrastructure.....	2-8
Table 2-2	Project Gages	2-13
Table 2-3	Proposed Recreation Facilities: Construction Personnel, Duration, Equipment List, and Disturbed Acreage	2-22
Table 2-4	Proposed Project Minimum Instream Flow from McCloud Dam into the McCloud River	2-32
Table 2-5	Proposed Project Minimum Instream Flows from Iron Canyon Dam into Iron Canyon Creek (cfs).....	2-34
Table 3-1	Shasta County Federal and State Air Quality Attainment Designations.....	3-18
Table 3-2	Shasta Lake – Lake Blvd O ₃ Exceedances for (Years 2013-2017).....	3-19
Table 3-3	Fish Species Identified in Project Reservoirs and Stream Reaches During Relicensing Technical Studies	3-30
Table 3-4	Special-Status Plant Species Known to Occur or Potentially Occurring in the Project Area.	3-39
Table 3-5	Special-Status Wildlife Species Known to Occur or Potentially Occurring in the Project Area.	3-55
Table 3-6	Developed Recreation Sites Inventoried in 2007.....	3-148
Table 3-7	Dispersed Recreation Sites Inventoried in 2007.....	3-149
Table 3-8	Changes in Boating and Angler Days ¹ under the Proposed Project	3-153

Figures

Figure 1-1	McCloud-Pit Project Location.....	1-2
Figure 2-1	Schematic of Existing McCloud-Pit Project Operation	2-2
Figure 2-2	Recreation Facilities in the Vicinity of McCloud Reservoir	2-15
Figure 2-3	Recreation Facilities in the Vicinity of Iron Canyon Reservoir.....	2-17
Figure 2-4	Recreation Facilities in the Vicinity of Pit 7 Reservoir.....	2-30
Figure 2-5	Large Woody Debris Sites	2-41

Acronyms

AAQS	Ambient Air Quality Standards
ac-ft	acre-feet
APE	Area of Potential Effect
AQAP	Air Quality Attainment Plan
AQMD	Air Quality Management District
BE	Biological Evaluation
BMI	benthic macroinvertebrate
BMP	Best Management Practice
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CBC	California Building Code
CDC	Centers for Disease Control and Prevention
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CO	carbon monoxide
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Ranking
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
DOC	California Department of Conservation
DPS	Distinct Population Segment
DSOD	Division of Safety of Dams
DWR	California Department of Water Resources
EIS	Environmental Impact Statement
ESA	Endangered Species Act

FERC	Federal Energy Regulatory Commission
FYLF	foothill yellow-legged frog
GHG	greenhouse gas
gpd	gallons per day
GWh	gigawatt hours
GWh/yr	gigawatt hours per year
HMBP	hazardous materials business plans
hp	horsepower
IS	Initial Study
IS/ND	Initial Study/Negative Declaration
KOP	Key Observation Point
kV	kilovolt
LOP	limited operating period
MIF	minimum instream flow
msl	mean sea level
MT CO ₂ e	metric tons of carbon dioxide equivalent
MW	megawatts
MVA	megavolt-ampere
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act
NO _x	oxides of nitrogen
NO ₂	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NSVPA	Northern Sacramento Valley Planning Area
O ₃	ozone
PAC	Protected Activity Center
PCA	Pest Control Adviser
PG&E	Pacific Gas and Electric Company
PM	particulate matter

ppm	parts per million
RM	river mile
RMO	Road Management Objective
ROG	reactive organic gases
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SHPO	California State Historic Preservation Officer
SO ₂	sulfur dioxide
SPCC	spill, prevention, control, and countermeasures
STNF	Shasta-Trinity National Forest
SVAQEPP	Sacramento Valley Air Quality Engineering and Enforcement Professionals
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Properties
UCMP	University of California Museum of Paleontology
USACE	United States Army Corps of Engineers
USEIA	United States Energy Information Administration
USEPA	United States Environmental Protection Agency
USFS	United States Department of Agriculture – Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VELB	valley elderberry longhorn beetle
VMT	vehicle miles traveled
VQO	Visual Quality Objectives

Executive Summary

Pacific Gas and Electric Company (PG&E) owns and operates the McCloud-Pit Hydroelectric Project (McCloud-Pit Project, or Project) (Federal Energy Regulatory Commission [FERC] Project No. 2106) located in the McCloud and Pit River drainages of Northern California in Shasta and Siskiyou Counties, California. The existing Project has an installed capacity of 368-megawatts. The Proposed Project analyzed in this document is the continued operation of the existing McCloud-Pit Project. To receive a new FERC operating license, PG&E is required to obtain a water quality certification (certification) under section 401 of the federal Clean Water Act. The State Water Resources Control Board (State Water Board) is the agency responsible for certification in California.

Issuance of a certification is a discretionary action that, under the California Environmental Quality Act (CEQA), requires the State Water Board to analyze the subject project's potential environmental impacts to water quality and the designated beneficial uses of water. For the Project, those beneficial uses are identified in the Central Valley Regional Water Quality Control Board (CVRWQCB) *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan)¹ (CVRWQCB 2018). This draft Initial Study/Negative Declaration (IS/ND) for the Proposed Project analyzes potential Project impacts and evaluates the level of significance of those impacts.

Project Description

In its application for a new FERC license, PG&E proposed changes to the McCloud-Pit Project to lessen potential Project impacts. The Proposed Project evaluated in this CEQA analysis included:

- > The existing McCloud-Pit Project, including continued operations and maintenance of existing infrastructure;
- > Increased minimum instream flows to protect aquatic resources in two Project-affected stream reaches: (1) McCloud River below McCloud Dam; and (2) Iron Canyon Creek below Iron Canyon Dam; and
- > Construction of recreation facility improvements and continued operation of the recreational facilities.

In addition to the changes to the existing McCloud-Pit Project proposed by PG&E, the Proposed Project addressed in this document incorporates the following:

- > Terms and conditions contained in FERC's final Environmental Impact Statement, Appendix D, Commission Staff Recommended Conditions, and Appendix E, Forest Service 4(e) Conditions (FERC 2011);

¹ *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region for the Sacramento River Basin and the San Joaquin River Basin*. Fifth Edition. Revised May 2018 (with Approved Amendments).

- > United States Department of Agriculture – Forest Service (USFS) 4(e) Conditions (USFS 2010a); and
- > Terms and conditions contained in the State Water Board’s certification that are necessary to protect water quality and the beneficial uses of water outlined in the Basin Plan (CVRWQCB 2018).

Findings and Determination

There is no substantial evidence in light of the whole record before the State Water Board that the Proposed Project may have a significant impact on the environment. On the basis of this evaluation, the State Water Board concludes:

- (i) Implementation of the Proposed Project will not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory;
- (ii) Implementation of the Proposed Project will not have impacts that are individually limited, but cumulatively considerable; and
- (iii) Implementation of the Proposed Project will not have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.

If the State Water Board approves the certification, it will file a Notice of Determination pursuant to California Code of Regulations title 14, section 15075.

DRAFT

Eileen Sobeck
Executive Director

Date

1 Introduction

1.1 Background

Pacific Gas and Electric Company (PG&E) owns and operates the McCloud-Pit Hydroelectric Project (McCloud-Pit Project or Project) located in the McCloud and Pit River drainages of Northern California in Shasta and Siskiyou Counties, California (Figure 1-1). The Proposed Project addressed in this document consists of the continued operation of the McCloud-Pit Project, Federal Energy Regulatory Commission (FERC) Project No. 2106, pursuant to a new 30- to 50-year FERC license, with modifications as described below.

In its application for a new FERC license, PG&E proposed changes to the Project including:

- > Changes to minimum instream flows (MIFs) in the McCloud River below McCloud Dam, and Iron Canyon Creek below Iron Canyon Dam to protect aquatic resources;
- > Implementation of management and monitoring plans to protect aquatic resources; and
- > Measures to maintain and enhance recreational opportunities, including construction to provide additional recreation facilities.

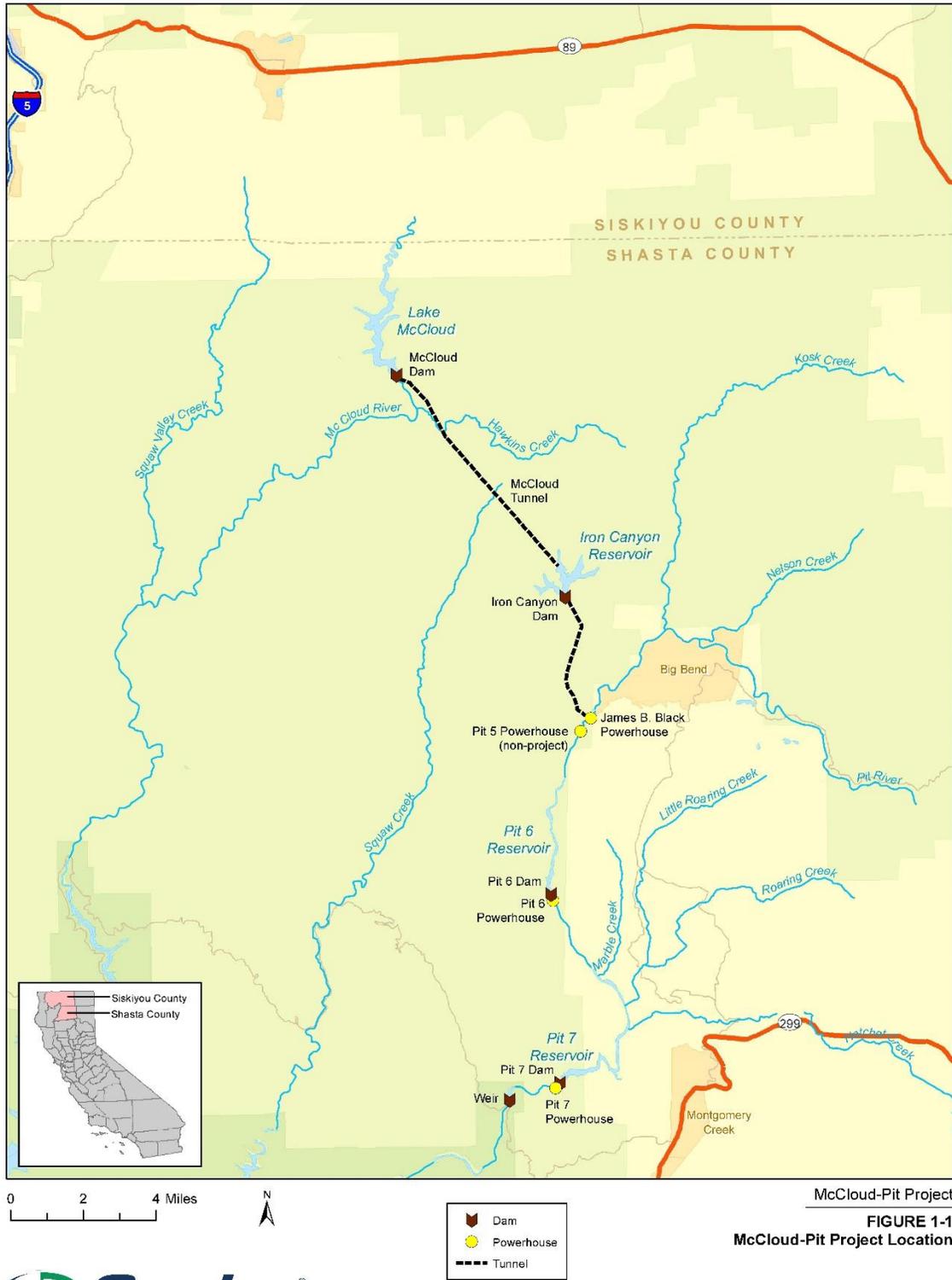
The Proposed Project under the California Environment Quality Act (CEQA) also includes:

- > Terms and conditions contained in FERC's final Environmental Impact Statement (EIS), Appendix D, Commission Staff Recommended Conditions and Appendix E (FERC 2011);
- > United States Department of Agriculture – Forest Service (USFS) 4(e) Conditions (USFS 2010a); and
- > Impacts of potential terms and conditions contained in the State Water Board's certification, that are necessary to protect water quality and the beneficial uses of water that are outlined in the Central Valley Regional Water Quality Control Board (CVRWQCB) *Water Quality Control Plan for the Sacramento and San Joaquin Rivers Basins* (Basin Plan)² (CVRWQCB 2018).

The Proposed Project area totals 3,707.6 acres of land, of which: 1,651.4 acres (45 percent) are federally owned and managed by the USFS; 1,239.4 acres (33 percent) are owned by PG&E; and the remaining 816.8 acres are private lands. It consists of three power generating developments (James B. Black, Pit 6, and Pit 7). These developments collectively include four reservoirs, three powerhouses, five dams, two tunnels, one afterbay, and associated equipment, transmission, and recreation facilities. Installed generation capacity for the Project is 368-megawatts (MW). The Proposed Project is discussed in more detail in Chapter 2.

² *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region for the Sacramento River Basin and the San Joaquin River Basin*. Fifth Edition. Revised May 2018 (with Approved Amendments).

Figure 1-1 McCloud-Pit Project Location



The McCloud-Pit Project was originally licensed by FERC on August 18, 1961. On July 16, 2009, PG&E filed an application for a new 30- to 50-year license under FERC's Integrated Licensing Process. The original license expired on July 31, 2011; however, the McCloud-Pit Project continues to operate under annual license extensions issued by FERC. The 2009 license application included proposed changes to existing operations. The proposed changes include: (a) higher MIF releases to protect aquatic resources in the McCloud River below McCloud Dam, and in Iron Canyon Creek below Iron Creek Dam; (b) measures to protect sensitive species; and (c) measures to maintain and enhance existing recreation opportunities and provide additional recreational facilities (FERC 2011).

Compliance with the National Environmental Policy Act (NEPA) must be demonstrated prior to FERC undertaking a federal action, including issuance of a new license to PG&E for continued operation and maintenance of the McCloud-Pit Project. On February 25, 2011, FERC issued the final EIS that analyzed environmental impacts of PG&E's Proposed Project, as well as the comments, conditions, and recommendations that FERC received during the draft EIS public and agency review period.

To receive a new FERC license, PG&E is required to obtain a water quality certification (certification) under section 401 of the federal Clean Water Act (CWA). The State Water Resources Control Board (State Water Board) is the agency in California that is responsible for acting on applications for CWA section 401 certification of hydroelectric projects. The purpose of a certification is to protect the waters of the United States by ensuring waste discharged to waters from a proposed activity meets water quality standards and other appropriate requirements. As part of the FERC licensing process the State Water Board must issue or deny certification for the McCloud-Pit Project. Certification conditions will become mandatory conditions of the FERC license for the McCloud-Pit Project once the license is issued. PG&E originally applied for certification by submitting an application for the Proposed Project on January 27, 2010. An application initiates a one-year time period for the State Water Board to act on the request for certification. From 2010 through 2017, PG&E withdrew and resubmitted the application annually. In 2018, the State Water Board denied the application without prejudice. On November 9, 2018, PG&E submitted the most recent application.

Issuance of a certification is a discretionary action that requires the State Water Board to comply with CEQA. (CEQA Guidelines³ §§ 15002, subd. (i), 15357.) The State Water Board is the lead agency under CEQA for the Project. (Pub. Resources Code, § 21067.) This analysis was prepared to comply with CEQA to assess the environmental effects from changes to the Proposed Project required by the certification issued by the State Water Board. In a CEQA analysis of an existing hydroelectric project, reauthorization of a project would not likely yield many environmental impacts because the environmental baseline against which impacts are measured for CEQA is the existing conditions. In contrast, certification requires an analysis of a project's overall effect on water quality, including whether the designated beneficial uses identified in the Basin Plan are adequately protected. The State Water Board may use a CEQA document prepared during the certification process to aid its review of a project's effects on public trust resources.

³ The CEQA Guidelines are found at California Code of Regulations, title 14, sections 15000 et seq.

To ensure compliance with CEQA, the State Water Board issued a notice, dated October 26, 2012, for informal consultation with responsible and trustee agencies regarding the environmental document, pursuant to CEQA Guidelines section 15063(g) (see Appendix A). The purpose of the consultation was to seek input from the agencies responsible for resources affected by the Proposed Project, as well as from non-governmental organizations (NGOs), Tribes, and interested members of the community. The State Water Board sought recommendations and supporting information regarding the type of CEQA document to prepare for the Proposed Project. After review and consideration of comments received, it was determined that a Negative Declaration (ND) was the appropriate document for the Proposed Project. To confirm this conclusion and provide additional information regarding the potential impacts of the Proposed Project, the State Water Board prepared an Initial Study (IS) for the Project. The IS assessed potential impacts from the Proposed Project and found that the Proposed Project will not have a significant effect on the environment. The IS is included in Chapter 3.

1.2 Use of FERC's EIS

CEQA Guidelines section 15221 states that when a project requires compliance with both CEQA and NEPA, state agencies should use the EIS or Finding of No Significant Impact (FONSI) rather than preparing an Environmental Impact Report or ND if the EIS or FONSI complies with the provisions of CEQA. This draft IS/ND includes information that is necessary to comply with CEQA for the purposes of the State Water Board's certification process but was not included in the final EIS. However, consistent per section 15150 of the CEQA Guidelines, the draft IS/ND incorporates by reference appropriate sections of the final EIS to avoid repetition of information. In addition, since the McCloud-Pit Project contains lands owned by the USFS, the relicensing process resulted in the development of USFS staff recommendations and mandatory conditions under section 4(e) of the Federal Power Act. PG&E incorporated those recommendations and conditions into the project it presented to the State Water Board for certification, and so they are included in the Proposed Project that is analyzed by this draft IS/ND. The State Water Board's certification will include terms and conditions that require PG&E to carry out the Project in the manner it has proposed.

1.3 Additional Environmental Analysis Required Under CEQA

Pursuant to CEQA Guidelines, the scope of the environmental analysis in this draft ND augments the analysis of the EIS completed by FERC, and includes the following:

- > Evaluation of resource areas that require additional analysis under CEQA that are not required by NEPA; and
- > A determination of the level of significance of impacts under CEQA.

As the CEQA lead agency, the State Water Board will use the findings of this draft ND to support the certification. FERC will incorporate the certification conditions into the new license for the McCloud-Pit Project.

1.4 Agency Participation and Application

Compliance with federal, state, and local regulations, as well as environmental permits, is required for construction and operation of the Proposed Project. PG&E and its contractors will adhere to all applicable requirements. Major federal, state, and local permits, approvals, and consultations identified for the licensing, construction, and operation of the Proposed Project are described in Table 1-1.

Table 1-1 Overview of Potential Future Permit Approval and Consultation Requirements for the PG&E McCloud-Pit Hydroelectric Relicensing Project

Jurisdiction	Permits, Approvals & Consultations
Federal Agencies	
FERC	FERC issued the final EIS for Hydropower License, McCloud-Pit Hydroelectric Project, FERC Project No. 2106, California. FERC will also review this draft ND for the Proposed Project.
United States Army Corps of Engineers (USACE)	Section 404 of the CWA authorizes the USACE to issue permits, after notice and opportunity for public hearing, for the discharge of dredge or fill material into the waters of the United States and adjacent wetlands. A nationwide 404 permit could be triggered by implementation of some plans incorporated in the Proposed Project, such as the Coarse Sediment Management Plan.
United States Fish and Wildlife Service (USFWS)	The USFWS has jurisdiction over any species listed under the federal Endangered Species Act (ESA). Consultation under section 7 of the federal ESA with the lead federal agency is required. USFWS determines whether a proposed action is likely to jeopardize the continued existence of, or destroy or adversely modify critical habitat of, federally listed species. Under the Migratory Bird Treaty Act, USFWS has responsibility for protecting nearly all species of birds, their eggs, and nests.
USFS, Shasta Trinity-National Forest	The McCloud-Pit Project is located, in part, on USFS lands. USFS permits will be needed to implement certain Proposed Project components, such as a Special Use Permit, Road Use Permit, and Timber Harvest Agreement.
State Agencies	
State Water Board	Section 401 of the CWA requires that prior to the issuance of a federal license or permit for an activity or activities that may result in a discharge of pollutants into navigable waters, the applicant must first obtain a certification issued by the State Water Board or the appropriate California Regional Water Quality Control Board. The State Water Board is the CEQA lead agency for the Proposed Project and is responsible for issuing the ND, adopting CEQA findings, and filing an associated Notice of Determination.

Jurisdiction	Permits, Approvals & Consultations
California Office of Historic Preservation	Under section 106 of the National Historic Preservation Act, consultation is required regarding identification of cultural resources, and preparation of a Memorandum of Agreement for adverse effects on resources list in or eligible for listing on the National Register of Historic Properties and review of the Historic Properties Management Plan.
California Department of Fish and Wildlife (CDFW)	<p>CDFW is a California Trustee Agency (CEQA Guidelines section 15386) that has jurisdiction over natural resources affected by a project, which are held in trust for the people of the State of California, with regard to the fish and wildlife of the state, designated rare or endangered native plants, and game refuges, ecological reserves, and other areas administered by CDFW.</p> <p>CDFW may also issue a Lake or Streambed Alteration Agreement (California Fish and Game Code sections 1600 - 1616) with conditions to protect resources whenever a bed or bank of a stream, lake, or reservoir is altered. For example, construction of boat ramps below the lake level would require a Lake or Streambed Alteration Agreement issued by CDFW.</p>
Native American Heritage Commission (NAHC)	The NAHC provides protection to Native American burials from vandalism and inadvertent destruction; provides a procedure for the notification of most likely descendants regarding the discovery of Native American human remains and associated grave goods; and brings legal action to prevent severe and irreparable damage to sacred shrines, ceremonial sites, sanctified cemeteries, and places of worship on public property. The NAHC also maintains an inventory of sacred places. Cultural resources are identified in the Proposed Project area and NAHC guidance will help assess and mitigate any impacts to these resources.
California Department of Transportation (Caltrans)	A transportation permit may be required for transport of oversized loads on state highways (this permit is usually obtained by the construction contractor or subcontractors).

Jurisdiction	Permits, Approvals & Consultations
Regional Agencies	
Regional Water Quality Control Board (RWQCB)	California RWQCBs issue certifications according to the CWA section 401 for construction-related disturbance of water quality. The Proposed Project may be subject to the Construction General Permit ^a for stormwater discharges associated with construction activity. These permits would apply to all construction projects that would disturb one or more acres of soil. These permits would require filing a Notice of Intent as well as the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP).
Local Agencies	
Shasta County	Shasta County has jurisdiction over planning, engineering, environmental health, traffic, and roads within the County. For the Proposed Project, Shasta County has specific interest in traffic, safety, and maintenance of road conditions.
Shasta County Air Quality Management District (AQMD)	Under state and federal law, the local AQMD is required to develop a plan for attaining ambient air quality standards. The Northern Sacramento Valley Planning Area (NSVPA) 2015 Triennial Air Quality Attainment Plan (NSVPA 2015) was adopted in Spring 2013. The air quality element of the Shasta County General Plan (County of Shasta 2004) contains control measures aimed at avoiding and reducing emissions of air contaminants into the local environment.

Notes:

^a *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities*. Water Quality Order No. 2009-0009-DWQ and National Pollutant Discharge Elimination System No. CAS000002, as amended by Order No. 2010-0014-DWQ, Order No. 2012-0006-DWQ, and any amendments thereto.

1.5 Public Review Process

This draft IS/ND is being circulated for a minimum of 30 days for public review to all individuals who have requested a copy, to the Office of Planning and Research, to the State Clearinghouse for distribution to appropriate resource agencies, and to the Shasta and Siskiyou County Clerks for posting.

A Notice of Intent will be distributed to the interested parties mailing list identified on FERC online⁴. The Notice of Intent identifies locations where the document is available for public review and invites interested parties to provide written comments. A copy of the Notice of Intent is attached to this document.

In addition, the State Water Board provided notice of intent to adopt a negative declaration by publication, in accordance with section 15072(b) of the CEQA Guidelines, in two newspapers of general circulation in the area affected by the Proposed Project: (1) Redding Record Searchlight; and (2) Mount Shasta Herald. Copies of the Notice of Intent and this draft IS/ND will also be available at two libraries near the area affected by the Proposed Project: (1) Redding library; and (2) McCloud library.

Reviewers should focus on the sufficiency of the document in identifying and analyzing possible impacts of the Proposed Project on the environment and, if potential impacts are identified, ways in which the impacts might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures to avoid or mitigate potential significant environmental impacts identified by the commenter.

⁴ Interested parties mailing list is available at: www.ferc.gov, under “Documents & Filings”, and under “eService”.

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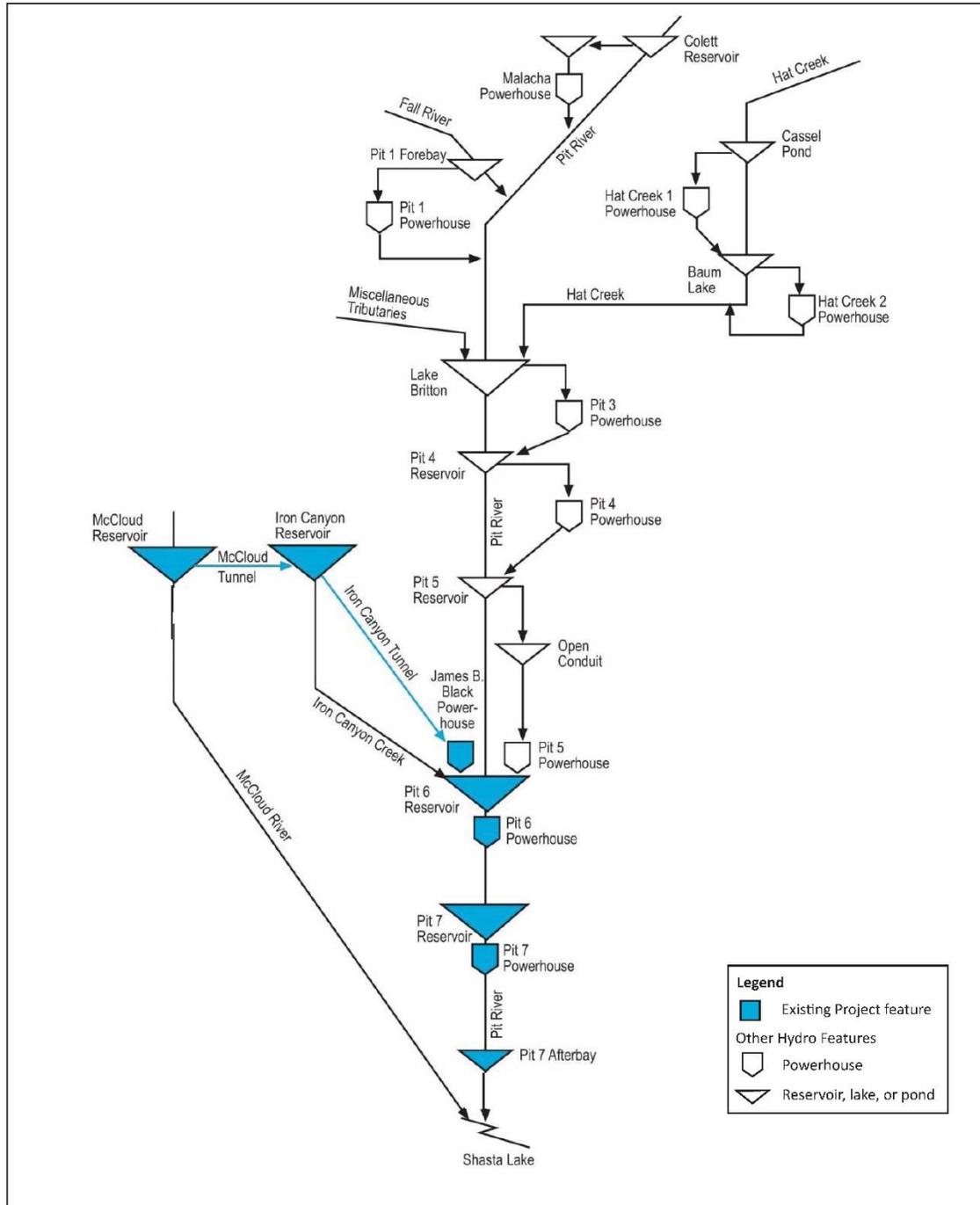
2 Project Description

2.1 Overview

The Proposed Project addressed in this document consists of the continued operation of the McCloud-Pit Project, FERC Project No. 2106, pursuant to a new 30- to 50-year FERC license. The McCloud-Pit Project is located along the western slope of the Cascade Range in northern California within Shasta and Siskiyou Counties, and partially within the Shasta-Trinity National Forest. The McCloud-Pit Project commenced commercial operation in 1965-1966. It is composed of three hydroelectric developments, James B. Black, Pit 6, and Pit 7, which in total encompass 3,707.6 acres. The McCloud-Pit Project has an installed generation capacity of 368 MW and generates an annual average of 364 MW of power. The locations of the various facilities and features are presented in Figure 1-1, and a schematic of project facilities is provided in Figure 2-1. The McCloud-Pit Project is the only hydroelectric project on the McCloud River, but is one of four hydroelectric projects owned and operated by PG&E in the Pit River basin. The three other projects in the Pit River watershed owned and operated by PG&E include: Pit 1 Hydroelectric Project (FERC No. 2687); Pit 3, 4, and 5 Hydroelectric Project (FERC No. 233); and Hat Creek Hydroelectric Project (FERC No. 2661).

The McCloud-Pit Project primarily involves the transfer of water from the McCloud River basin to the lower Pit River basin for the purposes of power generation. McCloud Reservoir is located on the McCloud River, which originates at Moosehead Creek, southwest of Mt. Shasta, and flows in a southwesterly direction before entering Shasta Lake. Shasta Lake is a reservoir formed by the United States Department of Interior – Bureau of Reclamation’s Shasta Dam at the confluence of the Pit, Sacramento, and McCloud Rivers. From McCloud Reservoir, water is transferred via the McCloud Tunnel to Iron Canyon Reservoir, which is located on Iron Canyon Creek, a tributary to the Pit River. Water from Iron Canyon Reservoir is transferred via the Iron Canyon Tunnel to the James B. Black Powerhouse, which is located on the Pit River just slightly upstream and on the opposite side of the Pit River from the Pit 5 Powerhouse (a part of PG&E’s Pit 3, 4, 5 Hydroelectric Project). Water from the McCloud River that enters the Pit River travels through the Pit 6 and Pit 7 developments before entering Shasta Lake. Although the McCloud-Pit Project diverts water from the McCloud River basin into the lower Pit River basin, both basins drain into Shasta Lake (FERC 2011).

Figure 2-1 Schematic of Existing McCloud-Pit Project Operation



Source: PG&E, 2009

McCloud-Pit Project

FIGURE 2-1

Schematic of Existing McCloud-Pit Project Operation



Date: 06-06-12

2.2 Existing Project

As defined by FERC, the existing Project area consists of lands necessary for the safe operation and maintenance of the Project and other purposes, such as recreation, shoreline control, and protection of environmental resources (FERC 2011). The Project area totals 3,707.6 acres of land, of which 1,651.4 acres (45 percent) are federally owned, 1,239.4 acres (33 percent) are owned by PG&E, and the remaining 816.8 acres are private lands. The Project area includes the facilities of the three hydroelectric developments (James B. Black, Pit 6, and Pit 7), including dams and diversions; impoundments; water conveyances and associated structures; access roads and trails; transmission, communication, and control lines; powerhouses; gaging stations; and helicopter landing sites used for access to Project structures. The Project area also includes land adjacent to Project features; the extent of these zones varies depending on the feature.

2.3 Existing Project Facilities

2.3.1 James B. Black Development

2.3.1.1 *McCloud Dam and McCloud Reservoir*

McCloud Dam is a 241-foot-high, 630-foot-long earth- and rock-filled dam located on the McCloud River that impounds McCloud Reservoir. The McCloud Reservoir has a surface area of 520 acres and a maximum storage capacity of about 35,197 acre-feet (ac-ft). The spillway (elevation 2,696.0 feet above mean sea level [feet msl]) is on the south side of the dam. The reservoir has a normal maximum water surface elevation⁵ of 2,680 feet msl. The dam's spillway is equipped with three radial gates measuring 27 feet by 24.5 feet that return spillage flows to the McCloud River. The dam also has a 7-foot-diameter diversion/outlet tunnel that runs under the dam to a 24-inch Howell-Bunger valve for releasing instream flows to the McCloud River, as well as an 84-inch-diameter butterfly valve for emergency use to control reservoir levels. Controls for the diversion/outlet tunnel are located at the McCloud Tunnel intake structure within McCloud Reservoir.

McCloud Reservoir is located on the McCloud River, which originates at Moosehead Creek, southwest of Mt. Shasta, and flows in a southwesterly direction before entering Shasta Lake. McCloud Reservoir is located approximately 24 river miles upstream from Shasta Lake. From McCloud Reservoir, water is transferred through a tunnel to Iron Canyon Reservoir, on Iron Canyon Creek.

The FERC boundary around McCloud Reservoir generally follows a contour line approximately 200 feet above the high-water line of the reservoir. The McCloud Tunnel, a 13-foot- to 17-foot-diameter tunnel, conveys water from McCloud Reservoir to Iron Canyon Reservoir. A 100-foot-wide corridor for the McCloud Tunnel extends southeast for about 7.2 miles between McCloud and Iron Canyon Reservoirs. Where the McCloud Tunnel crosses Hawkins Creek, there is a 0.25-mile-long, 100-foot-wide corridor for the Project access road (PG&E 2009b).

⁵ Normal maximum water surface elevation is the maximum level to which water may rise under normal operating conditions, exclusive of any provision for flood surcharge.

2.3.1.2 McCloud Tunnel

Water impounded by McCloud Dam is diverted from the McCloud River via a 7.2-mile-long tunnel, and a 563-foot-long pipeline section at Hawkins Creek crossing, that hydraulically links McCloud Reservoir and Iron Canyon Reservoir. A tunnel intake structure and tower, about 17 feet in diameter, within McCloud Reservoir collects water for the McCloud Tunnel approximately 115 feet above the original river bed, and then transfers the water southeasterly to Iron Canyon Reservoir. The differential in water surface elevations between the two reservoirs controls the amount of water drafted through the tunnel. Water diverted through the McCloud Tunnel diversion bypasses the reach of the McCloud River between the McCloud Reservoir and Shasta Lake, which is approximately 24 miles long.

2.3.1.3 Iron Canyon Dam and Reservoir

Iron Canyon Dam is a 214-foot-high and 1,130-foot-long earth-filled dam that impounds Iron Canyon Creek to create Iron Canyon Reservoir. The Iron Canyon Reservoir has a maximum storage capacity of 24,241 ac-ft with about a 500-acre surface area. The Iron Canyon Dam has a slide gate leading to a 48-inch-diameter pipe for instream flow releases to Iron Canyon Creek. Normal maximum water surface elevation within the reservoir is 2,664 feet msl.

Iron Canyon Creek is a tributary of the Pit River. Water from Iron Canyon Reservoir flows through the Iron Canyon Tunnel to the James B. Black Powerhouse. Water that flows through the James B. Black Powerhouse discharges into the Pit River. Once in the Pit River, the water flows through the Pit 6 and Pit 7 developments before entering Shasta Lake.

The FERC boundary around Iron Canyon Reservoir generally follows a contour line approximately 100 to 200 feet above the high-water line of Iron Canyon Reservoir, and in some places extends beyond this distance to include existing recreation facilities.

2.3.1.4 Iron Canyon Tunnel and Penstock

Iron Canyon Tunnel is a 2.9-mile-long, 14-foot to 18-foot-diameter tunnel that diverts water from Iron Canyon Reservoir. A 1,194-foot-long by 11.5-foot-diameter pipeline at the Willow Spring Creek crossing and a partially bifurcated 5,467-foot-long by 11.5-foot-diameter steel penstock deliver water from the Iron Canyon Tunnel to the James B. Black Powerhouse. The tunnel and penstock have a total flow capacity of 2,000 cubic feet per second (cfs). Water diverted through the Iron Canyon Tunnel bypasses the Iron Canyon Creek reach between Iron Canyon Reservoir and Pit 6 Reservoir, which is approximately 4 miles long.

2.3.1.5 James B. Black Powerhouse

James B. Black Powerhouse is located on the northwest bank of the Pit River, about 0.5 mile upstream of the Pit 5 Powerhouse (FERC Project No. 233). The James B. Black Powerhouse is a three-level, reinforced-concrete structure containing two vertical shaft impulse turbines rated at 104,000 horsepower (hp) each. The turbines operate at a normal maximum gross head⁶ of

⁶ The normal maximum gross head is the maximum allowed vertical distance between the upstream surface water (headwater) forebay elevation and the downstream surface water (tailwater) elevation at the tailrace.

1,226 feet. Two vertical axis outdoor generators, Unit 1 rated at 94.8 megavolt-ampere (MVA)⁷ and Unit 2 rated at 92.6 MVA, are connected to a three-phase, 86-MVA transformer bank. Their combined maximum capacity is 172 MW. Average annual generation within the past 30 years (1987 to 2016) at the station is 629.9-gigawatt hours (GWh). Water is discharged from the James B. Black Powerhouse through a tailrace leading directly from the generation units to the Pit River.

2.3.1.6 Transmission

The primary transmission lines for the James B. Black Powerhouse (230 kilovolt [kV]) extend about 0.5 mile from the transformer bank in the switchyard adjacent to James B. Black Powerhouse to the switchyard adjacent to the non-Project Pit 5 Powerhouse.

2.3.2 Pit 6 Development

2.3.2.1 Pit 6 Dam and Reservoir

Pit 6 Reservoir begins shortly below the Pit 5 Powerhouse (FERC Project No. 233) on the Pit River, and Pit 6 Dam is located approximately 5 miles downstream of James B. Black Powerhouse. Pit 6 Dam is a 183-foot-high, 560-foot-long concrete gravity dam with a crest elevation of 1,432 feet msl. The top of Pit 6 Dam contains a trash rake, motors for two 42-foot high by 49-foot long slide gates, and a control building. The control building houses a hydraulic system for two 8-foot-diameter low-level outlets at the base of Pit 6 Dam. The Pit 6 Reservoir has a maximum storage capacity of about 15,619 ac-ft and a maximum surface area of about 268 acres. The normal maximum water surface elevation of the reservoir is 1,425 feet msl. Pit 6 Reservoir serves as the forebay for the Pit 6 Powerhouse. Two 18-foot-diameter steel penstocks with a combined total flow capacity of 6,470 cfs extend 602 feet from the Pit 6 Dam to the Pit 6 Powerhouse turbines located at the base of the dam.

2.3.2.2 Pit 6 Powerhouse

Pit 6 Powerhouse is located along the east bank of the Pit River at the base of Pit 6 Dam. The powerhouse is a four-level, reinforced concrete structure, three levels of which are below grade. The structure contains two vertical-shaft, Francis reaction turbines, which are rated at 53,000 hp each and operate at a normal maximum gross head of 155 feet. There are two outdoor vertical axis generators, rated at 44 MVA each, with each unit connected to a three-phase, 44-MVA transformer bank that increases powerhouse output to 230 kV. The maximum generator capacity is 80 MW. Average annual generation between 1987 and 2016 was 341.2 GWh. Water is discharged from the Pit 6 Powerhouse directly into the Pit 7 Reservoir.

2.3.2.3 Transmission

The primary transmission lines for the Pit 6 Powerhouse extend about 3.3 miles from the switchyard adjacent to Pit 6 Powerhouse to PG&E's interconnected transmission system.

⁷ MVA is the measure of electrical capacity equal to the product of the voltage times the current. Electric equipment capacities are sometimes stated in MVA.

2.3.3 Pit 7 Development

2.3.3.1 *Pit 7 Dam and Reservoir*

Pit 7 Reservoir begins immediately downstream of Pit 6 Dam on the Pit River, and Pit 7 Dam is located 6 miles downstream of Pit 6 Powerhouse. Pit 7 Dam is a 228-foot-high by 770-foot-long concrete gravity dam. The top of Pit 7 Dam contains a trash rake, motors for two 49-foot by 42-foot slide gates at the crest of the dam, and a control building. The control building houses hydraulic controls for two, 8-foot-diameter low-level outlets at the base of the dam. Pit 7 Reservoir has a maximum storage capacity of 34,142 ac-ft and a surface area of about 468 acres at a normal maximum water surface elevation of 1,270 feet msl. The Pit 7 Reservoir serves as the forebay for Pit 7 Powerhouse. Two penstocks, 15 feet in diameter, extend 572 feet from the Pit 7 Dam to the turbines in the Pit 7 Powerhouse, located at the base of the dam. Total combined flow capacity within the penstocks is 7,440 cfs.

2.3.3.2 *Pit 7 Powerhouse*

Pit 7 Powerhouse is located along the east bank of the Pit River at the base of the Pit 7 Dam. The Pit 7 Powerhouse consists of a four-level reinforced concrete structure, three levels of which are below grade. The powerhouse contains two vertical-shaft, Francis reaction turbines that are rated at 70,000 hp each and operate at a normal maximum gross head of 205 feet. Two vertical axis generators are rated at 52.2 (Unit 2) and 62.1 (Unit 1) MVA. Their maximum combined capacity is 112 MW. Each unit is connected to a three-phase, 58-MVA transformer bank that increases powerhouse output to 230 kV. The average annual generation over the last 30 years (1987 to 2016) is 470.3 GWh. Water from Pit 7 Powerhouse is directly discharged into Pit 7 Afterbay.

2.3.3.3 *Transmission*

The primary transmission lines for the Pit 7 Powerhouse extend about 3.5 miles from the switchyard adjacent to Pit 7 Powerhouse to PG&E's interconnected transmission system.

2.3.3.4 *Pit 7 Dam and Afterbay*

Pit 7 Afterbay has a surface area of about 69 acres at a normal maximum water surface elevation of 1,067 feet msl, which is the maximum water surface of Shasta Lake. The Pit 7 Afterbay Dam is a 30-foot-high, steel reinforced, rock-fill structure, including a variable width concrete gravity weir section⁸. Pit 7 Afterbay serves to attenuate flow discharging from Pit 7 Dam and Powerhouse before entering Shasta Lake, which abuts and sometimes inundates the Afterbay.

2.3.4 Routine Operations and Maintenance

Under the current FERC license, the McCloud-Pit Project operates both as a peaking system and a load-following system throughout the year, using the available water supply after satisfying MIF requirements (FERC 2011).

⁸ A gravity weir is a solid obstruction put across a river to raise its water level.

James B. Black, Pit 6, and Pit 7 Powerhouses are typically operated on a peaking basis. The powerhouses' output varies on an hourly basis from minimum or no load during the off-peak periods, up to the powerhouses' maximum output during peak demand periods. During the mid-peak demand periods, the powerhouses are operated near their more efficient loads depending on the available flow. During periods of high flow, the powerhouses are operated at their maximum capacities in order to minimize spill (FERC 2011).

Operations of McCloud and Iron Canyon Reservoirs are coordinated to optimize use of water. The movement of water through the McCloud Tunnel from McCloud Reservoir to Iron Canyon Reservoir, and then through the Iron Canyon Tunnel and penstock from Iron Canyon Reservoir to James B. Black Powerhouse, is carefully planned in order to prevent spills at Iron Canyon Reservoir and minimize spills at McCloud Reservoir. The water surface elevation in Iron Canyon Reservoir is regulated through the operation of James B. Black Powerhouse. The relative level of McCloud Reservoir and Iron Canyon Reservoir determines the rate of flow through the McCloud Tunnel that connects the two reservoirs. When spill conditions are forecasted because of high inflows to the reservoirs, Iron Canyon Reservoir is drawn down to avoid use of its spillway, to maximize the McCloud Tunnel flow, and to minimize spill at McCloud Dam. While Iron Canyon Reservoir is operated to prevent spill, the McCloud Reservoir, on average, spills about four out of every ten years (FERC 2011).

PG&E has 72 employees based at their Burney Service Center facility for operation of its facilities. These employees spend approximately 25 percent of their work hours on the operation and maintenance of the existing McCloud-Pit Project. The frequency of staff visits to Project facilities is summarized as follows:

- > Each of the five dams within the existing McCloud-Pit Project are visited weekly by an operator and maintenance staff on separate days;
- > Five days a week, the three powerhouses are visited on rotation by an operator;
- > Two days a week, the three powerhouses are visited on rotation by maintenance staff; and
- > A planned two-week outage may occur once a year requiring up to 24 personnel visiting the powerhouses daily during the outage.

The operation and maintenance practices for existing McCloud-Pit Project infrastructure are shown on Table 2-1. Table 2-2 provides the location and identification number of gages in the McCloud-Pit Project area.

Table 2-1 Routine Operations and Maintenance Practices for Existing McCloud-Pit Project Infrastructure

Project Area Type	Maintenance Activity	Frequency	Relevant Project Area	Description
Roads	Snow removal	Two to three times per year; during winter.	<ul style="list-style-type: none"> • Oak Mountain Road • McCloud Reservoir Road (Forest Road 11 to boat ramp only; done infrequently, as access to reservoir needed) • Pit 6 Road 	Removal is usually done using a pickup truck or 10-wheel dump truck with snow blade attachment. A road grader may also be used to remove heavy snow deposits.
Roads	Grading of dirt and gravel roads	A few times per year; during spring.	<ul style="list-style-type: none"> • Oak Mountain Road 	Procedure entails grading approximately three feet off the edge of the road (including gutter).
Roads	Vegetation trimming and hazard tree removal	Every other year.	<ul style="list-style-type: none"> • Oak Mountain Road • Pit 6 Road • Pit 7 Road and Pit 7 Afterbay Road 	Procedure is to lop and scatter on the side of the road or chip and blow.
Roads	Slide debris removal	As needed year-round.	<ul style="list-style-type: none"> • Oak Mountain Road • Pit 6 Road • Pit 7 Road • Pit 7 Afterbay Road and associated areas 	Slides of 20 yards or less are repaired with a pickup truck with snow blades or a 10-wheel dump truck with blade. Slides less than 20 yards are repaired with the use of loaders, excavators, and a dump truck. Material is hauled to designated site.
Roads	Ditch and culvert cleaning	Annually; during summer or fall.	<ul style="list-style-type: none"> • Pit 6 Road • Oak Mountain Road 	Cleaning performed with a backhoe and hand shoveling.

Project Area Type	Maintenance Activity	Frequency	Relevant Project Area	Description
Roads	Paved road asphalt repairs	Annually; during summer.	<ul style="list-style-type: none"> • Pit 6 Road • Pit 7 Road 	Pickup trucks, 10-wheel dump trucks, loaders, backhoes, graders, and hand tools are used.
Powerhouses, dams, switchyards, tunnels, penstocks, and gages	Herbicide spraying	Pre-emergent herbicide followed by post emergent during May/June.	<ul style="list-style-type: none"> • Powerhouses (James B. Black, Pit 6, Pit 7) • Dam faces, including groins (Pit 6, Pit 7, Pit 7 Afterbay, Iron Canyon, McCloud) • James B. Black Penstock • Tunnels (Iron Canyon Tunnel at Willow Creek Siphon, the conduit at Hawkins Creek Crossing) • Iron Canyon Surge Chamber 	At powerhouses, pre-emergent is applied by hand early in the year; after leaf-out has occurred, another herbicide is applied to perennial vegetation. At all other facilities, grass material is allowed but woody material targeted for removal. Dam face groins are kept completely clear of vegetation.

Project Area Type	Maintenance Activity	Frequency	Relevant Project Area	Description
Powerhouses, dams, switchyards, tunnels, penstocks, and gages	Vegetation clearing	As needed year-round.	<ul style="list-style-type: none"> • Powerhouses (James B. Black, Pit 6, Pit 7); within fenced perimeter up to a 5-ft buffer outside the fence • Dam faces, including groins (Pit 6, Pit 7, Pit 7 Afterbay, Iron Canyon, McCloud) • Gages MC-1 and MC-10 	Follows herbicide spraying. At dam faces, grass material allowed but woody material targeted for removal. Dam face groins kept completely clear of vegetation.
Powerhouses, dams, switchyards, tunnels, penstocks, and gages	Maintain trails	As needed year-round.	<ul style="list-style-type: none"> • Gages MC-1 and MC-10 	Trim vegetation encroaching into the path of travel and lop and scatter trimmings. Use of shovels to redirect runoff and abate erosion.
Transmission lines	Hazard tree removal	Annually patrolled for compliance.	<ul style="list-style-type: none"> • 12-kV distribution line • James B. Black Transmission Line • Pit 6 Transmission Line • Pit 7 Transmission Line 	Lines patrolled by vehicle, off-highway vehicle, or on-foot, as appropriate. In sites with more difficult access, trimmed vegetation is lopped and scattered. In accessible sites, trees are chipped, and the material removed off-site. Herbicide application is applied to prevent re-sprouting.

Project Area Type	Maintenance Activity	Frequency	Relevant Project Area	Description
Transmission lines	Vegetation clearing	Annually patrolled for compliance.	<ul style="list-style-type: none"> • 12-kV distribution line • James B. Black Transmission Line • Pit 6 Transmission Line • Pit 7 Transmission Line 	<p>Clearing is conducted beneath wires, including a 10-ft buffer and the 40-ft border area. In Year 1 the site is masticated/mowed. In Year 2 the site is inspected to determine if follow-up herbicide application is necessary. Two to three years following, the site is re-inspected to determine what treatment needed. Recruiting trees are removed by hand or via individual herbicide applications.</p>
Transmission lines	Herbicide spraying ^a	As needed.	<ul style="list-style-type: none"> • 12-kV distribution line • James B. Black Transmission Line • Pit 6 Transmission Line • Pit 7 Transmission Line 	<p>Herbicide applications are all ground-based to individual plants. Generally, a backpack unit is used 90 percent of the time and a tank is used ten percent of the time.</p>
Spoil pile sites	Site grading	Every 3–5 years, as needed.	<ul style="list-style-type: none"> • Downstream end of Pit 6 and Pit 7 roads • Base of McCloud Dam • Conduit at Hawkins Creek Crossing 	<p>Grade maintained so site acts as a catch basin.</p>

Project Area Type	Maintenance Activity	Frequency	Relevant Project Area	Description
Spoil pile sites	Material burning	Approximately once per year, as needed.	<ul style="list-style-type: none"> • Downstream end of Pit 6 and Pit 7 roads • Base of McCloud Dam • Conduit at Hawkins Creek Crossing 	Includes floating debris removed from reservoirs, material removed from gutters, and slide debris.
All Project Areas	Employee awareness training	Annual refresher training.	<ul style="list-style-type: none"> • All Project Areas 	Training includes prevention of weed transport (via dirty vehicles), cleaning procedures for rental equipment, cleaning procedures when moving between watersheds, protection of special-status occurrences, and elderberry identification information.

Notes:

^a Herbicide applications are prescribed in a recommendation prepared by a licensed Pest Control Adviser to treat a specific site and condition. Herbicides commonly used contain one or more of the following listed active ingredients (although other suitable pesticides may be available and appropriate for a given situation): Chlorsulfuron; Clopyralid; Oxyfluorfen; Fluazifop-P; Glyphosate; Dithiopyr; Imazapyr; Isoxaben; Oryzalin; Prodiamine; Sulfometuron; Flumioxazin; Triclopyr; and Aminopyralid.

Table 2-2 Project Gages

Location	USGS^a Gage No.	PG&E Gage No.
McCloud River near McCloud	11367500	MC-3
McCloud Reservoir Storage	11367740	MC-6
McCloud-Iron Canyon Diversion Tunnel	1367720	MC-8
McCloud River below McCloud Dam	11367760	MC-7
McCloud River near Ah-Di-Na	11367800	MC-1
McCloud River Above Shasta Lake	11368000	MC-5
Iron Canyon Reservoir Storage	11363920	MC-9
Iron Canyon Creek below Iron Canyon Dam	11363930	MC-10
Pit River at Big Bend	11363000	PH-27
James B. Black Powerhouse	11363910	MC-11
Pit 5 Powerhouse (FERC Project No. 233)	11362700	PH-69
Pit 6 Reservoir Storage	11364100	PH-58
Pit 6 Powerhouse	11364150	PH-63
Pit 7 Reservoir Storage	11364700	PH-59
Pit 7 Powerhouse	11364800	PH-64
Pit River near Montgomery Creek (downstream of Pit 7 Dam)	11365000	PH-47

Notes:

^a United State Geological Survey

2.3.5 Existing Recreation Facilities

There are three developed recreation areas within the Project boundary: (1) Tarantula Gulch boat ramp at McCloud Reservoir; (2) Deadlun Creek Campground at Iron Canyon Reservoir; and (3) Hawkins Landing Campground and boat ramp at Iron Canyon Reservoir. All of these facilities are located within the James B. Black Development. There are no developed recreation sites within the Project Boundary in the lower Pit River; however, dispersed recreation is evident in a few locations on the lower McCloud River and Hawkins Creek Crossing (FERC 2011).

2.3.5.1 McCloud Reservoir

Existing recreation facilities in the vicinity of McCloud Reservoir are shown on Figure 2-2. The Tarantula Gulch boat ramp, which was constructed by PG&E and is operated by the USFS, includes a boat ramp and a developed picnic area. Specific recreation facilities include:

- > Single-lane concrete boat launch ramp;
- > Loading dock;
- > Overflow parallel parking with unmarked spaces;
- > 22 parking spaces for vehicles with trailers;
- > Three picnic tables;
- > Four wildlife-resistant trash receptacles; and
- > Vault restroom with two unisex accessible stalls.

Figure 2-2 Recreation Facilities in the Vicinity of McCloud Reservoir

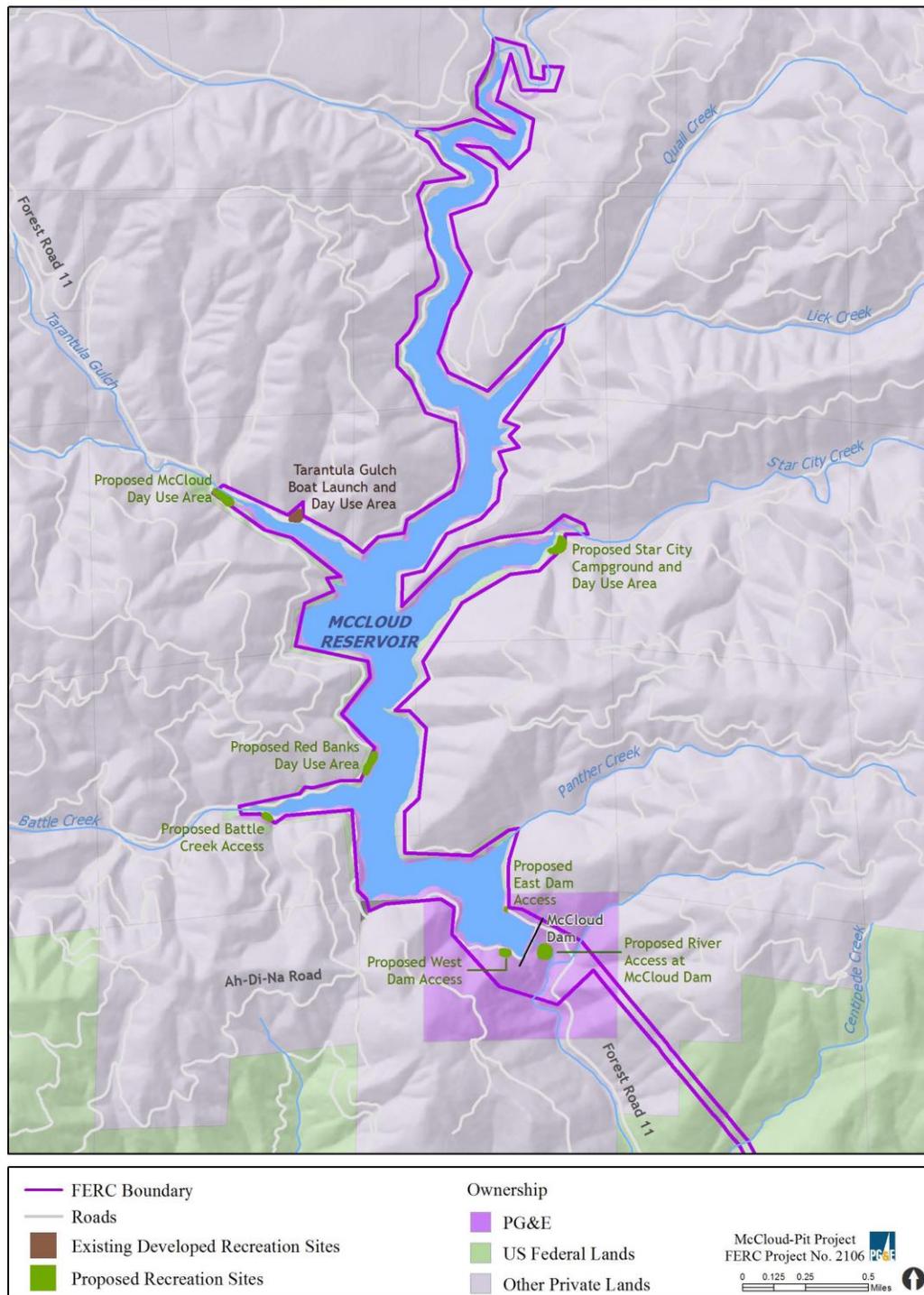


FIGURE 2-2
 Recreation Facilities in the Vicinity of McCloud Reservoir

The bottom of the boat ramp is one foot below the normal minimum operating reservoir level (elevation 2,634 feet) and typically provides boater access during the entire recreation season (May 15 to October 15). The USFS reports that sediment and debris accumulate on the ramp and occasionally impede boat launching (FERC 2011).

The majority of lands surrounding McCloud Reservoir are privately owned. The USFS and PG&E lands that are accessible to the public are located on the southern end of the reservoir, extending from near the access road to Tarantula Gulch and continuing across McCloud Dam to Star City Creek (see Figure 2-2). Dispersed recreation is allowed on PG&E and USFS lands, unless otherwise designated. PG&E identified nine user-created dispersed recreation sites at lower-gradient access points accessible from Star City Road around McCloud Reservoir, and a dispersed campsite on an island in McCloud Reservoir. The Star City Creek area is the largest dispersed site at McCloud Reservoir, offering primitive camping on approximately 13 acres.

2.3.5.2 Iron Canyon Reservoir

There are two developed recreation areas at Iron Canyon Reservoir, which include:

- > Hawkins Landing Campground and boat ramp, which is owned and operated by PG&E and comprises of: one single-lane concrete launch ramp; 11 campsites with fire rings and picnic tables; one non-potable water hand pump; one trash receptacle; and two vault toilets.
- > Deadlun Campground, which is owned and operated by the USFS and comprises of: 27 campsites with fire rings and picnic tables; three vault restrooms with single, unisex, ADA-accessible stalls; and overflow parallel parking with unmarked spaces. (See Figure 2-3.)

Hawkins Landing Campground and boat ramp have the only boat launch ramp on Iron Canyon Reservoir. No formal parking is available at the boat launch and the number of vehicles that the boat launch area can accommodate depends on reservoir elevation. Normal project operations can cause Iron Canyon Reservoir to fluctuate on a daily basis, which affects the availability of parking at the shoreline near the boat launch. When the reservoir is at full pool (2,664 feet in elevation), visitors park vehicles in Hawkins Landing Campground. As the elevation of Iron Canyon Reservoir lowers, more shoreline is exposed and visitors park along the shoreline, thereby increasing the potential number of vehicles that can park near the launch area. Since 1996, PG&E has voluntarily maintained the reservoir water surface elevation above 2,615 feet to keep the boat ramp useable during the primary recreation season from May 15 to October 15.

Figure 2-3 Recreation Facilities in the Vicinity of Iron Canyon Reservoir

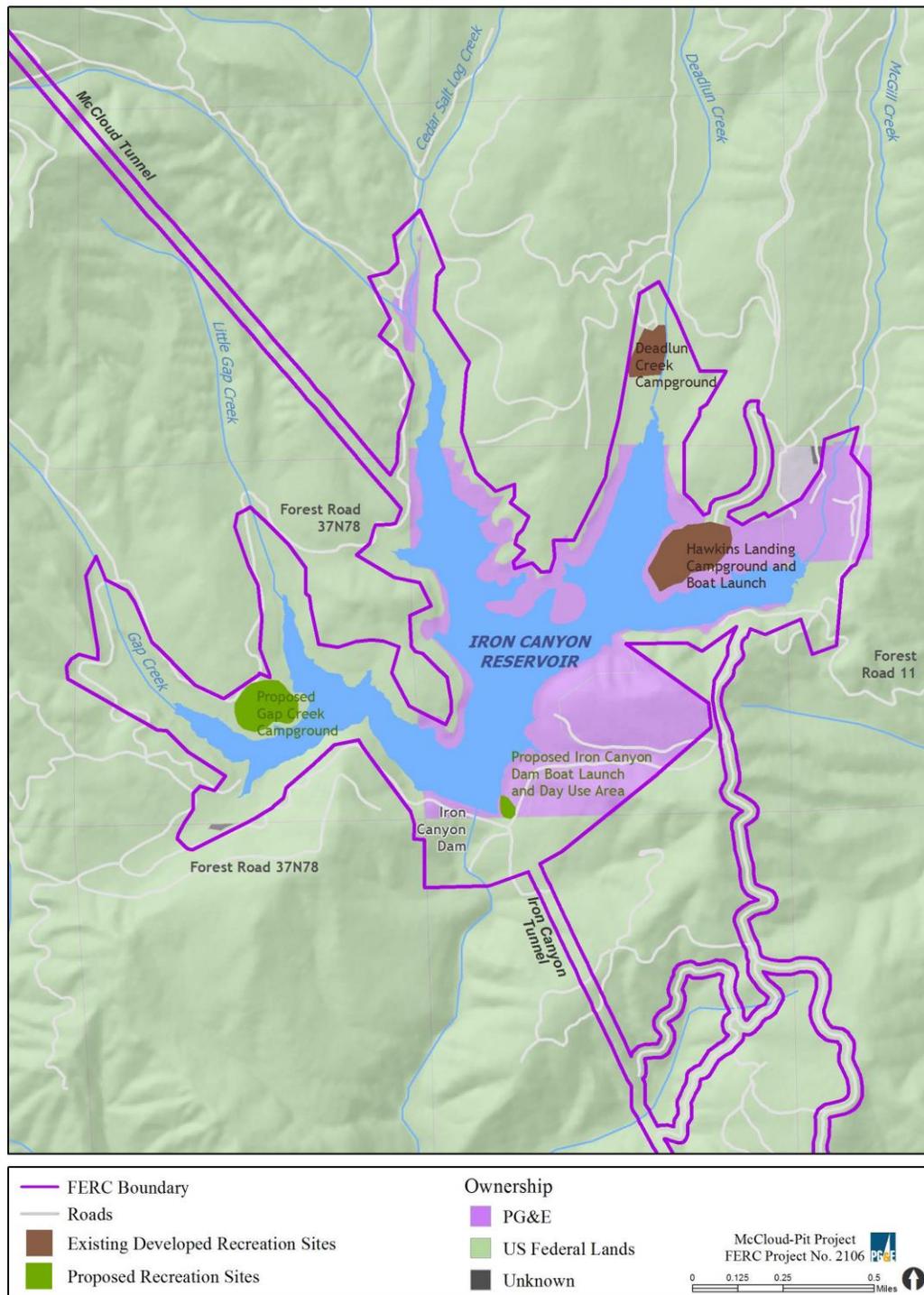


FIGURE 2-3
 Recreation Facilities in the Vicinity of Iron Canyon Reservoir

The majority of lands surrounding Iron Canyon Reservoir are PG&E or USFS lands. Recreation user-created access trails (pedestrian and off highway vehicles) originate from both campgrounds and nearby areas providing dispersed shoreline access. PG&E has identified 22 dispersed recreation sites around Iron Canyon Reservoir with heavily used dispersed recreation sites at the areas adjacent to Deadlun Campground and Iron Canyon Reservoir spillway.

2.3.5.3 Lower McCloud River and Hawkins Creek Crossing

Recreation areas downstream of McCloud Reservoir include the area at Hawkins Creek crossing (inside the Project Boundary) and the lower McCloud River (outside the FERC project boundary). Hawkins Creek crossing is a cleared level area where the McCloud Tunnel crosses Hawkins Creek, about one mile above the confluence with the lower McCloud River. PG&E documented several dispersed recreation sites including: two dispersed recreation sites near Ash Camp; a dispersed campsite on Hawkins Creek at Hawkins Creek Tunnel that is accessible via a PG&E Project road; and a dispersed campsite on the PG&E spoil pile area on Hawkins Creek that is just north of the Hawkins Creek Tunnel (FERC 2011).

The lower McCloud River extends 24 river miles from McCloud Dam to Shasta Lake, but only the upper nine miles of this 24-mile reach have land-based public access within USFS lands. No Project lands are located along the lower McCloud River except for the area immediately below McCloud Dam.

2.3.6 Existing Recreation Facilities Routine Operations and Maintenance

PG&E currently hires six to eight caretakers to operate and maintain the existing recreational facilities generally from mid-May through mid-September, when recreation use is highest. Caretakers are typically located at campgrounds where fees are collected. During the off-season, when recreation use significantly decreases, the number of caretakers on-site and the operation and maintenance effort is similarly reduced. Many existing recreation facilities are closed during the off season.

The caretakers' daily activities include the following: cleaning facilities; picking up litter; reporting potential public safety hazards; correcting unsafe conditions; collecting fees; maintaining daily campground occupancy records; pest management; managing signs; operating water systems; performing minor maintenance and repairs on existing facilities; water treatment and testing; dumpster waste removal; and hazard tree removal; however the septic pumping of the sealed vault toilets are typically contracted to third parties.

2.3.7 Project Safety

The McCloud-Pit Project is currently operating under the existing FERC license and annual license extensions, during which time FERC staff have conducted operational inspections focused on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operation, compliance with the terms of the license, and proper maintenance. In addition, the McCloud-Pit Project has been inspected and evaluated every 5 years by an independent consultant, and a consultant's safety report has been filed for FERC's review. As part of the relicensing process, the FERC staff would evaluate the adequacy of the project facilities under a new license. Special license articles would be

included in any license issued, as appropriate. FERC staff would continue to inspect the McCloud-Pit Project during the new license term to assure continued adherence to FERC-approved plans and specifications; special license articles relating to construction, operation, and maintenance; and accepted engineering practices and procedures (FERC 2011).

2.3.8 Existing Environmental Measures

2.3.8.1 *Water Flow Requirements*

The current license for the McCloud-Pit Project includes MIF requirements for McCloud River and Iron Canyon Creek below their respective dams (Article 31). For the McCloud River below the McCloud Dam, requirements include a MIF release of 50 cfs from May through November, and 40 cfs from December through April, as measured at gage MC-7. Steam flows in addition to the MIF requirements are determined by month and water-year type, and are released as necessary to maintain the 160 to 210 cfs that is required at gage MC-1, which is located below the confluence of Hawkins Creek and the McCloud River (FERC 2011).

Flows of at least 3 cfs are required to be released to Iron Canyon Creek below Iron Canyon Dam at all times. A minimum of 150 cfs is required below the Pit 7 Powerhouse whenever the surface water elevation of Shasta Lake is below the invert elevation (or bottom) of the draft tubes of the powerhouse (1,055 feet msl) (FERC 2011).

To facilitate use of the boat ramp during the recreation season from May 15 to October 15, PG&E voluntarily keeps the water surface elevation of Iron Canyon Reservoir at or above elevation 2,615 feet msl, instead of the minimum elevation of 2,593 feet msl allowed by the current license.

2.4 Proposed Project

A project is defined under CEQA as “the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment” and that requires a discretionary approval from a public agency. (Cal. Code Regs., tit. 14, § 15378, subd. (a)(3).)

The Proposed Project evaluated in this draft IS/ND includes:

- > The existing McCloud-Pit Project including operations and maintenance of infrastructure;
- > Construction of recreational facility improvements and continued operation of the recreational facilities;
- > Increased MIF releases proposed by PG&E for two Project-affected stream reaches: (1) the McCloud River below McCloud Dam; and (2) Iron Canyon Creek below Iron Canyon Dam. Under the Proposed Project, the range and schedule of MIF releases to protect water quality and support the designated beneficial uses of these stream reaches (CVRWQCB 2018, Basin Plan Table 2-1); and
- > Implementation of 13 monitoring and management plans. Under the Proposed Project, and as required by USFS Final 4(e) Conditions, PG&E would develop and implement 13 resource management plans. These are described in detail in Section 2.4.6, Proposed

Environmental Management and Monitoring Plans. All USFS plans will require FERC approval prior to implementation.

In PG&E's license application, dated July 2009, PG&E proposed two new hydropower developments: (1) the McCloud Development, which would consist of a new powerhouse below McCloud Dam that would use water stored in McCloud Reservoir; as well as an associated transmission line that would be routed from the new McCloud powerhouse to the town of McCloud in Siskiyou County; and (2) the Pit 7 Afterbay Development, which would consist of a new powerhouse below the Pit 7 Afterbay Dam that would use water released from Pit 7 Afterbay; as well as an associated transmission line that would be routed from the new Pit 7 Afterbay Powerhouse to the existing Pit 7 Switchyard near Pit 7 Dam.

PG&E, however, did not finalize designs or capacities for the two proposed hydropower developments in their license application. PG&E stated in their license application that the economic feasibility of the two proposed hydropower developments depends in part on conditions included in the new Project license (i.e., new minimum instream requirements). As a result, PG&E will wait until they receive the new FERC license for the relicensing of the McCloud-Pit Project before they determine if the two hydropower developments will be built. Therefore, the Proposed Project addressed in this draft IS/ND does not include these two proposed hydropower developments.

If PG&E decides to build the two proposed hydropower developments after the issuance of a new license by FERC, then PG&E would need to request an amendment to the certification for the relicensing of the McCloud-Pit Project. An amendment to the certification to incorporate the development of two new hydropower facilities for the McCloud-Pit Project would require compliance with CEQA.

2.4.1 Project Purpose and Objectives

To receive a new FERC license, PG&E is required to obtain a certification under section 401 of the CWA. The State Water Board is the agency in California that is responsible for acting on applications for certification of hydroelectric projects. The purpose of a certification is to protect the waters of the United States by ensuring waste discharged to waters from a proposed activity meet water quality standards presented in the Basin Plan (CVRWQCB 2018). The Basin Plan identifies the beneficial uses and water quality objectives for water bodies within this geographic region. Identified beneficial uses for the McCloud River include: municipal and domestic water supply; power (generation); water contact recreation; canoeing and rafting; other noncontact recreation; cold freshwater habitat; cold spawning habitat; and wildlife habitat.

The beneficial uses for the Pit River (downstream of the confluence of Hat Creek to Shasta Lake) include all those listed for the McCloud River (except cold spawning habitat) and additionally: agricultural supply (irrigation, stock watering); warm freshwater habitat; and warm spawning habitat. As part of the FERC licensing process, the State Water Board must issue or deny a certification for the McCloud-Pit Project. Conditions in a certification will become mandatory conditions of the FERC license for the McCloud-Pit Project once the license is issued.

2.4.2 Proposed Project Boundary

The Proposed Project includes expansion of the existing FERC boundary by 1.88 acres to accommodate expansion of an existing access road to Hawkins Landing Campground. All other Project improvements would occur within the existing FERC boundary.

In addition, in 2017, PG&E proposed as a separate project an adjustment to the FERC boundary of an additional 1.41 acres to accommodate realignment of the Pit 7 Access Road, which provides access to Pit 7 Dam and Powerhouse. The original Pit 7 Access Road failed in 2017 due to winter storms and landslides and, in order to re-establish access, PG&E repaired and realigned the road along a less steep slope to reduce the likelihood of road damage in the future.

A summarized description of the Proposed Project is provided below. For a more detailed description of the Proposed Project, refer to the final EIS, Section 2.3, Staff Alternative.

2.4.3 Proposed Recreation Facilities

PG&E proposes to construct four new recreation facilities at McCloud Reservoir, two new recreation facilities at Iron Canyon Reservoir, one new recreation facility at Pit 6 Reservoir, and two new recreation facilities at Pit 7 Afterbay.

In addition, PG&E proposes to make recreation improvements at McCloud Reservoir, Iron Canyon Reservoir, and Pit 7 Afterbay. Table 2-3 lists the proposed recreation facilities, number of workers, duration and types of equipment necessary to construct the facilities, and total amount of disturbed acreage per facility. Figures 2-2, 2-3, and 2-4 provide the locations of the proposed facilities. Proposed changes at each facility are described in the following sections.

Table 2-3 Proposed Recreation Facilities: Construction Personnel, Duration, Equipment List, and Disturbed Acreage

Project Changes	Recreational Facility	Work Crew	Duration (Days)	Equipment	Disturbed Area (acres)
McCloud Reservoir					
Improved	Tarantula Gulch Boat Launch and Day Use Area	14	60	Concrete mixer truck, power screed, drill rig	2.6
New	McCloud Day Use Area	7	15	Drill rig	<1
Improved	Red Banks Day Use Area	7	30	No additional equipment required.	<1
Improved	Battle Creek Shoreline Access	7	10	No additional equipment required.	<1
Improved	McCloud Reservoir West Dam Shoreline Access	7	10	No additional equipment required.	<1
Improved	McCloud Reservoir East Dam Shoreline Access	7	10	No additional equipment required.	<1
Improved	Star City Campground and Day Use Area	16	65	Concrete Mixer Truck, Drill Rig for Well, Grader, Front End Loader, Drum Roller, Backhoe, Three Crew Trucks	13.6
Improved	McCloud Dam River Access	7	20	No additional equipment required.	<1
Iron Canyon Reservoir					
Improved	Hawkins Landing Boat Launch	10	40	Concrete Mixer Truck, Power Screed	1.7

Project Changes	Recreational Facility	Work Crew	Duration (Days)	Equipment	Disturbed Area (acres)
Improved	Hawkins Landing Campground	10	60	Drill Rig, Mixer Truck	5
Improved	Deadlun Campground	10	60	Drill Rig, Mixer Truck	9.8
New	Gap Creek Campground	20	40	Drill Rig, Mixer Truck, Power Screed, Drum Roller, Paver, Grader, Loader, Drum Roller, Two Backhoes	6.5
New	Iron Canyon Dam Boat Launch	12	60	Drill Rig, Mixer Truck, Power Screed, Drum Roller, Paver, Backhoe, Grader	2.9
New	Three Day Use Areas at Iron Canyon Reservoir	5	12	No additional equipment required.	<1
Pit 7 Reservoir					
Improved	Upper Pit 7 Reservoir Trailheads	5	8	No additional equipment required.	<1
New	Lower Pit 7 Reservoir Shoreline Access	7	35	No additional equipment required.	<1
Pit 7 Afterbay					
Improved	Fenders Flat Day Use Area	12	30	Mixer Truck	2.25

Note: Each recreational area will have a baseline equipment list including: grader, dozer, front end loader, backhoe, excavator, dump truck, 3-crew trucks, plate compactor, drum roller, paver. Additional equipment needs for each area are listed above.

In general, nine of the 17 facility improvements would each disturb less than one acre. The largest area of disturbance, Star City Campground and Day Use Area, would encompass approximately 13.6 acres. The total disturbance for all new and improved facilities would be approximately 48 acres. No additional laydown areas would be needed to construct any of the facilities.

During construction of the recreation facility improvements, usable excess construction materials such as lumber, paint, metal pipe, etc. would be returned to the PG&E Service Center for use on other projects. Waste would be disposed of at local waste transfer stations or Anderson Solid Waste Landfill. Based on the number of facilities requiring improvement, the estimated volume of waste generated by construction would be 750 cubic yards (refer to specific facility descriptions below).

2.4.3.1 McCloud Reservoir

Recreation facilities, and associated improvements, surrounding the McCloud Reservoir are presented in Figure 2-2 and are described in more detail in the following sections.

2.4.3.1.1 Tarantula Gulch Boat Launch and Day Use Area

The total area disturbed by improvements to the Tarantula Gulch Boat Launch and Day Use Area would be approximately 2.6 acres, and the work would be accomplished by approximately 14 workers over 60 working days. Planned features of the Tarantula Gulch Boat Launch include a 30-foot-wide, two-lane, concrete boat ramp and a 4-foot-wide walkway. Improvements include extending the boat launch 4 feet in length to extend below the minimum reservoir pool elevation (2,634 feet) and installing an 8-foot by 40-foot sliding boarding float dock or pier.

The proposed improvements would also include:

- > A new asphalt-surfaced access road and parking area with a maximum of 12 pull through car/trailer parking spaces;
- > Ten head-in car/trailer parking spaces and six car parking spaces;
- > Potable water supply;
- > One sealed vault toilet;
- > Day use area with three covered picnic sites;
- > An access trail to the edge of the reservoir;
- > An informational kiosk and pay station; and
- > Signage and site security lighting.

2.4.3.1.2 McCloud Day Use Area

The total area disturbed by improvements to the McCloud Day Use Area would be less than one acre, and the work would be accomplished by approximately seven workers over 15 working days.

The proposed improvements include:

- > An asphalt surfaced access drive;
- > Parking area for five vehicles (with one Americans with Disabilities Act-compliant space);
- > Five picnic sites (each with picnic table and barbecue/fire ring);
- > A trail surfaced with natural materials leading to the reservoir shoreline;
- > One sealed vault toilet;
- > One potable water hydrant;
- > One trash receptacle; and
- > Entry sign and informational kiosk.

2.4.3.1.3 Red Banks Day Use Area

The total area disturbed by improvements to the Red Banks Day Use Area would be less than one acre, and the work would be accomplished by approximately seven workers over 30 working days. The existing area is currently used for informal day use activities on the shoreline at McCloud Reservoir, and would become a developed recreation site through the installation of picnic tables, a vault restroom, and a shoreline access trail. The shoulder of the USFS Road 38N11 is currently used for parking. The roads into this day use area would be re-graded, and bank stabilization measures would be necessary due to undercutting near the shoreline.

2.4.3.1.4 Battle Creek Shoreline Access

The total area disturbed by improvements to the Battle Creek Shoreline Access would be less than one acre, and the work would be accomplished by approximately seven workers over 10 working days. This existing shoreline access currently has an asphalt parking area and access to the water's edge along USFS Road FS-11. The parking area would be reorganized to encourage multiple user groups, and the trail would be surfaced with native materials.

2.4.3.1.5 McCloud Reservoir West Dam Shoreline Access

The total area disturbed by improvements to the McCloud Reservoir West Dam Shoreline Access would be less than one acre, and the work would be accomplished by approximately seven workers over ten working days. Improvements for this existing shoreline access would include improving the vehicle parking area and improving accessibility of the trail to the edge of the water by constructing new switchbacks.

2.4.3.1.6 McCloud Reservoir East Dam Shoreline Access

The total area disturbed by improvements to the McCloud Reservoir East Dam Shoreline Access would be less than one acre, and the work would be accomplished by approximately seven workers over ten working days. Improvements for this existing shoreline access would include parking area designation, improved vehicle access, and signage.

2.4.3.1.7 Star City Campground and Day Use Area

The total area disturbed by improvements to the Star City Campground and Day Use Area would be approximately 13.6 acres, and the work would be accomplished by 16 workers over 65 working days. The existing Star City dispersed camping area would be improved to include access road improvements, campsites, day use area, and trails. The 2.6-mile access road, USFS Road S38N04Y, would be reconstructed.

Proposed improvements to Star City Campground would include:

- > Up to ten walk-in campsites and a host site, with campsite features such as a table, a tent pad, and fire ring;
- > Roads with vehicle barriers;
- > Asphalt parking area;
- > Camping spurs;
- > One sealed vault toilet;
- > Animal resistant trash enclosures;
- > Message board and signage;
- > Potable water source; and
- > Shoreline access paths.

2.4.3.1.8 River Access below McCloud Dam

The total area disturbed by improvements to the river access below McCloud Dam would be less than one acre, and the work would be accomplished by approximately seven workers over 20 working days.

Proposed improvements to this river access area would include:

- > Improvements to the access road;
- > Angler access trails;
- > Compact aggregate parking area;
- > One sealed vault toilet;
- > Animal resistant trash receptacle; and
- > A put-in for white water boating.

2.4.3.2 Iron Canyon Reservoir

Recreation facilities and associated improvements surrounding Iron Canyon Reservoir are presented in Table 2-3 and Figure 2-3 and are described in more detail in the following sections.

2.4.3.2.1 Hawkins Landing Boat Launch

The total area disturbed by improvements to the Hawkins Landing Boat Launch would be approximately 1.7 acres, and the work would be accomplished by approximately ten workers over 40 working days. This existing boat launch would undergo reconstruction that would consist of a concrete-surfaced and striped parking lot that has mix of single and double spaces with pull-through design for a minimum of ten vehicles with trailers above the reservoir high water level and adjacent to the existing ramp location. This boat ramp would be reconstructed to current Cal Boating standard (surface only) for a single lane ramp.

2.4.3.2.2 Hawkins Landing Campground

The total area disturbed by improvements to the Hawkins Landing Campground would be approximately five acres, and the work would be accomplished by approximately ten workers over 60 working days. This existing campground would undergo reconstruction which would include removing existing infrastructure, redesigning, and reconstructing the campground to consist of:

- > An asphalt surfaced loop road, with ten campsites plus one host site (each campsite would have a table, tent pads, asphalt surfaced parking spurs and fire rings);
- > Sealed vault toilets;
- > Signage;
- > Vehicle control barriers; and
- > A trail, surfaced with native materials, routed from the campground to the boat launch and potable water. Some vegetation would be removed to create views of the reservoir from the campsites near the shoreline.

2.4.3.2.3 Deadlun Campground

The total area disturbed by improvements to the Deadlun Campground would be approximately 9.8 acres, and the work would be accomplished by approximately ten workers over 60 working days. The existing campground footprint would remain the same. Currently, the campground has 27 campsites, including two multi-family sites. Campsites would be improved to meet a recreational vehicle requirement of 16-foot width and include multi-family camping. For each campsite, a tent pad, a table, animal resistant food lockers and trash receptacles, and barbecue/fire ring would be added. The campsite interior road would be re-graded with gravel, chip seal, asphalt surfaces, and circulation barriers to control vehicle access. Some vegetation removal would be conducted to open the view of the reservoir. In general, the campground would be re-graded to make campsites with flat areas more accessible. The shore access would also be redesigned and re-graded to provide a compacted aggregate surface trail six to eight feet wide along the shore, above the normal high-water line, and would allow for a

continuous shoreline trail route from Deadlun Creek to Cedar Salt Log Creek (approximately 1.8 miles).

2.4.3.2.4 Gap Creek Campground

The total area disturbed by improvements to the Gap Creek Campground would be approximately 6.5 acres, and the work would be accomplished by approximately 20 workers over 40 working days. Proposed features for the new Gap Creek Campground include:

- > Asphalt surfaced access loop roads to two campground areas;
- > Asphalt parking area for seven walk-in campsites;
- > An asphalt loop road and parking spurs for 11 campsites;
- > Sealed vault toilets;
- > Potable water supply;
- > Picnic tables and barbecue/fire rings at each campsite;
- > A host campsite;
- > Animal resistant food lockers and trash receptacles;
- > Compacted aggregate trails for shoreline access;
- > Campground entry signs, information signage, and a pay station; and
- > Security lighting.

2.4.3.2.5 Iron Canyon Dam Boat Launch

The total area disturbed by improvements to the Iron Canyon Dam Boat Launch would be approximately 2.9 acres, and the work would be accomplished by approximately 12 workers over 60 working days. Proposed features for the new Iron Canyon Dam Boat Launch include:

- > A single lane concrete boat ramp constructed to Cal Boating standards with walkway and mid-ramp turn around extended to four feet below the minimum reservoir pool elevation;
- > A sliding boarding float dock or pier;
- > An asphalt-surfaced access entry and parking area, with a minimum of 15 pull-through vehicle parking spaces (ten with trailers);
- > A sealed vault toilet;
- > Potable water supply;
- > Animal resistant trash receptacle;
- > Day use area with five picnic tables and barbecue/fire rings;
- > Facility entry sign;
- > An informational kiosk; and

> Security lighting.

2.4.3.2.6 Three Shoreline Access Areas at Iron Canyon Reservoir

The total area disturbed by development of three new shoreline access areas along Iron Canyon Reservoir would be less than one acre combined, and the work would be accomplished by approximately five workers over 12 working days. Suitable areas along the reservoir would need to be identified. These new shoreline access areas would include surfaced parking sites and shoreline access trails surfaced with native materials.

2.4.3.3 Pit 7 Reservoir

Recreation facilities and associated improvements surrounding Pit 7 Reservoir are presented in Figure 2-4 and are described in more detail in the following sections.

2.4.3.3.1 Upper Pit 7 Reservoir Trailheads

The total area disturbed by improvements to trailheads around the Upper Pit 7 Reservoir would be less than one acre, and the work would be accomplished by approximately five workers over eight working days. Two trailheads and trails, located approximately 0.25 and 0.6 miles downstream of the Pit 6 Dam, would be constructed along the Pit 6 Powerhouse Road to provide access to Pit 7 Reservoir. Improvements to the upstream trailhead would include providing parking along the shoulder of the road for about four vehicles and constructing a pedestrian access (that would be surfaced with native materials) on an existing access trail that is routed from Pit 6 Dam Access Road to the shoreline and which can be used as a hand-launch boat access trail. Improvement to the downstream trailhead would include a surfaced parking area for a minimum of three vehicles and a new trail surfaced with native materials. This trail would require installing two culverts where the trail crosses stream drainages, and a foot bridge at Cape Horn Creek. This downstream shoreline access trail would provide a secondary location where boaters could exit the reservoir if the flows released from Pit 6 Powerhouse prevented boaters from traveling to the shoreline access provided at the upstream end of the reservoir.

2.4.3.3.2 Lower Pit 7 Reservoir Shoreline Access

The total area disturbed by a new shoreline access trail in the lower Pit 7 Reservoir would be less than one acre, and the work would be accomplished by approximately seven workers over 35 working days. A new shoreline access trailhead, trail, and a location for hand-launching boats would be constructed at the downstream end of Pit 7 Reservoir, just upstream of Pit 7 Dam. Proposed improvements include a surfaced vehicle access road and surfaced parking for a maximum of eight vehicles. The new parking area would include a new turnaround and gate to prevent public access to the dam and spillway. Shoreline access would be provided by constructing an 80-foot metal stairway that would connect the Pit 7 Dam Access Road to a new pedestrian trail (surfaced with native materials), which would extend 1,900 feet and terminate at the shoreline. The existing floating boom would be relocated to provide beach access that is outside the restricted access area near the dam.

Figure 2-4 Recreation Facilities in the Vicinity of Pit 7 Reservoir

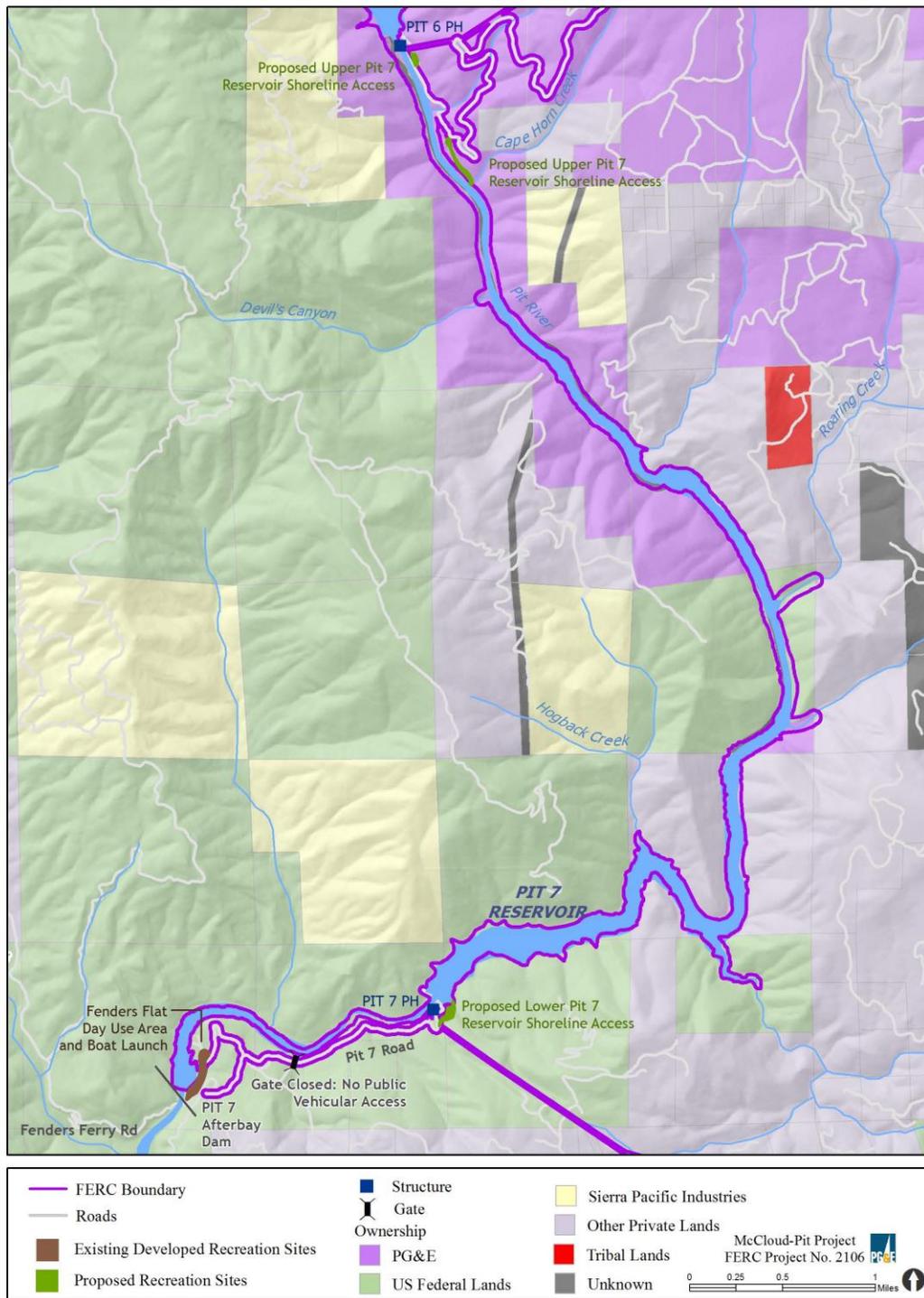


FIGURE 2-4
 Recreation Facilities in the Vicinity of Pit 7 Reservoir

2.4.3.4 Pit 7 Afterbay

2.4.3.4.1 Fenders Flat Day Use Area

The total area disturbed by improvements to Fenders Flat Day Use Area would be approximately 2.25 acres, and the work would be accomplished by approximately 12 workers over 30 working days. This existing site is within Shasta-Trinity Recreation Area adjacent to the Pit 7 Afterbay Dam and includes an access road (FR 35N66) to the car-top boat launch, parking, and dispersed camping area surrounding the solar-powered, high water-flow warning tower. Site improvements would include a surfaced parking area, picnic tables, pedestal grill, potable water, and sealed vault toilet. Vegetation in the area previously disturbed by off-road vehicle use would be restored by scarifying the disturbed areas and replanting with natural grasses. The access road to the day use area, which starts at USFS Road 35N23, is approximately 0.2 mile-long and would be re-graded and sloped.

2.4.4 Proposed Recreation Facility Operations and Maintenance

In addition to routine recreation facility operations and maintenance described in Section 2.3.6, the Proposed Project also includes an additional two to three caretakers at Iron Canyon Reservoir and one to two additional caretakers at McCloud Reservoir. In addition to being responsible for operations and maintenance at the recreation facilities where they are located, the caretakers would also be responsible for other nearby recreation facilities such as day use and shoreline access areas. The exact details of the how the Proposed Project recreation facilities would be operated and maintained will be developed after the license is issued and during the finalization of the Recreation Management Plan.

2.4.5 Proposed Minimum Instream Flows

Overall, the Proposed Project would increase MIF releases from McCloud and Iron Canyon Dams into their respective downstream reaches. PG&E would also continue to provide MIF releases of 150 cfs to the Pit River below Pit 7 Dam when Shasta Lake is below 1,055 feet msl to maintain water flow in the Pit 7 Afterbay.

PG&E proposes to release mean daily flows of a minimum of 175 cfs year-round from the McCloud Dam (as measured at PG&E gage MC-7), such that the mean daily flow at Ah-Di-Na (PG&E gage MC-1) is at a minimum of 200 cfs. Flows would be augmented during the period of February 15 through August 31, as described in Table 2-4. PG&E proposes to implement the MIF release schedule for Iron Canyon Creek below Iron Canyon Dam as described in Table 2-5.

Table 2-4 Proposed Project Minimum Instream Flow from McCloud Dam into the McCloud River

Month	Lower McCloud River MIF by Water-Year Type^a	Net Change in flow from year-round minimum
Year-round minimum	Release ≥ 175 cfs at McCloud Dam (MC-7); and Maintain ≥ 200 cfs at Ah-Di-Na (MC-1)	
	If the February 1 McCloud Runoff Percentage^b is:	Then change in flow will be:
February 15-29	0-75%	No flow change
	76-89%	No flow change
	90-99%	Increase flow by 75 cfs at MC-7
	100-119%	Increase flow by 125 cfs at MC-7
	≥120%	Increase flow by 175 cfs at MC-7
March 1-15	0-75%	No flow change
	76-89%	Increase flow by 50 cfs at MC-7
	90-99%	Increase flow by 50 cfs at MC-7
	100-119%	Increase flow by 100 cfs at MC-7
	≥120%	Increase flow by 150 cfs at MC-7
	If the March 1 McCloud Runoff Percentage^c is:	Then change in flow will be:
March 16-31	0-75%	No flow change
	76-89%	No flow change
	90-99%	Increase flow by 50 cfs at MC-7
	100-119%	Increase flow by 50 cfs at MC-7
	≥120%	Increase flow by 150 cfs at MC-7

Month	Lower McCloud River MIF by Water-Year Type ^a	Net Change in flow from year-round minimum
April 1-15	0-75%	No flow change
	76-89%	No flow change
	90-99%	No flow change
	100-119%	Increase flow by 50 cfs at MC-7
	≥120%	Increase flow by 50 cfs at MC-7
All Water-Year Types		
April 16 – June 30	If flow releases are ≥ 200 cfs on April 16 at MC-7	Then decrease flow at MC-7 by 50 cfs each Friday after April 15 until flow is 200 cfs.
April 16 – June 30	If flow releases are < 200 cfs on April 16 at MC-7	Then release 175 cfs at MC-7; and maintain a minimum of 200 cfs at Ah- Di-Na (MC-1)
July 1 – August 31	Release 175 cfs at MC-7; and Maintain a minimum of 215 cfs at Ah- Di-Na (MC-1)	
September 1 – February 15	Release 175 cfs at MC-7; and Maintain a minimum of 200 cfs at Ah- Di-Na (MC-1)	

Notes:

- ^a Using most recent California Department of Water Resources (DWR) Sacramento Valley Water-Year Type Index forecast.
- ^b February 1 runoff (RO) percentage from DWR Bulletin 120 for McCloud River above Shasta Lake.
- ^c March 1 RO percentage from DWR Bulletin 120 for McCloud River above Shasta Lake.

Table 2-5 Proposed Project Minimum Instream Flows from Iron Canyon Dam into Iron Canyon Creek (cfs)

Month	Below Normal, Dry, Critically Dry	Above Normal	Wet
October	7	7	10
November	7	7	10
December	7	10	15
January	7	10	15
February	7	10	15
March	10	15	≥ 20*
April	10	15	≥ 20*
May	7	10	15
June	7	10	15
July	7	7	10
August	7	7	10
September	7	7	10

Notes:

* In March and April of Wet Water Year Types, the flow control valve on Iron Canyon Dam shall be fully opened. Mean daily flow shall be at a minimum 20 cfs during this period.

In addition, PG&E proposes to implement the following measures:

- > Ramp down all spill events that are operationally controllable at McCloud Dam by valve operation at a maximum rate of 150 cfs per 48 hours until the prescribed MIF value is reached; and ramp up operationally controllable spills at McCloud Dam at a maximum rate of 200 cfs per 24-hour period.
- > When testing the flow valve at Iron Canyon Dam, ramp up and ramp down at a maximum rate of 20 cfs increments.
- > Determine water-year type based on “Percent of Average, April through July Forecast” for the McCloud River above Shasta Lake, as provided by California Department of Water Resources (DWR) Bulletin 120 or its successor.

2.4.6 Required Environmental Management and Monitoring Plans Under the Proposed Project

Through a collaborative effort with relicensing participants and the public, PG&E developed nine resource management plans that were filed with the Final License Application. Subsequently, the USFS developed a set of draft environmental management plans to ensure that the Proposed Project does not significantly impact natural and cultural resources on USFS managed lands. Any of the draft environmental management plans that are incorporated as a condition of the certification will require approval by the Deputy Director for the Division of Water Rights (Deputy Director) prior to implementation. The Deputy Director may make modifications to a draft plan as a condition of approval.

Under the USFS Final Section 4(e) Conditions for the Proposed Project, dated November 29, 2010, PG&E would be required to finalize and file with FERC for approval the following 13 environmental management/monitoring plans:

- > Aquatic Biological Monitoring Plan
- > Erosion and Sediment Control Management Plan
- > Fire and Fuels Management Plan
- > Coarse Sediment Management Plan
- > Historic Properties Management Plan⁹
- > Large Woody Debris Plan
- > Recreation Development and Management Plan
- > Road and Transportation Facility Management Plan
- > Sign and Interpretive/Education Plan
- > Terrestrial Biological Management Plan
- > Vegetation and Invasive Weed Management Plan
- > Visual Quality Management Plan
- > Water Quality and Water Temperature Monitoring Plan

These plans are described in the following sections, including components in each plan that are required per the USFS Final Section 4(e) Conditions. All of these plans will require finalization and approval by mandatory conditioning state and federal resource agencies prior to implementation. If that process results in modifications of these Project components, the State Water Board will evaluate the modifications in accordance with CEQA Guidelines section 15162(b).

⁹ In FERC's final EIS, FERC considered the Historic Properties Management Plan that PG&E filed on January 26, 2010 to be final. On May 20, 2011, FERC executed a Programmatic Agreement to implement the 2010 Historic Properties Management Plan with the California State Historic Preservation Officer. The Historic Properties Management Plan contains provisions allowing for amendment if additional information is provided by the USFS, Winnemem Wintu Tribe, and Pit River Tribe in the future.

2.4.6.1 Aquatic Biological Monitoring Plan

USFS Final Section 4(e) condition No. 27 requires the development of an Aquatic Biological Monitoring Plan. The Aquatic Biological Monitoring Plan described below is incorporated into the Proposed Project that was submitted to the State Water Board for certification. The Aquatic Biological Monitoring Plan will define how to monitor the status of trout and other fish populations, benthic macroinvertebrate (BMI) populations, and special-status aquatic species in the lower McCloud River, Iron Canyon Creek, and Pit 7 Reservoir under the new MIF requirements and other changes stipulated in the new license. Under condition 27 of the USFS Final Section 4(e) Conditions, the Aquatic Biological Monitoring Plan will include the following components:

- > Fish population trend assessment in Iron Canyon Creek and the Lower McCloud River with monitoring at specific intervals;
- > Standardized sampling and data protocols consistent with relicensing studies, to the extent possible, to ensure comparability of survey results with existing data;
- > For Lower McCloud River and Iron Canyon Creek, periodic survey once every three years for the first nine years following the first full year of the new license required MIF, and then once every five years for the term of the license. For Pit 7 Reservoir, periodic survey once every five years following license acceptance;
- > BMI monitoring component using the Surface Water Ambient Monitoring Program, or current protocol, including population heterogeneity, composition, and trends;
- > Aquatic special-status species (e.g., western pond turtles, foothill yellow-legged frogs) protocol and schedule for monitoring within the Project waters and rivers;
- > Protocols to monitor for and prevent introduction of invasive aquatic species, consistent with State Water Board and CDFW regulations;
- > Report of all aquatic survey and monitoring results within one year of data collection, with a USFS GIS compatible map that includes base data from all post-licensing surveys; and
- > Periodic monitoring of fish passage conditions at Gap Creek, Deadlun Creek, and Cedar Salt Log Creek Road crossings around Iron Canyon Reservoir.

2.4.6.2 Coarse Sediment Management Plan

USFS Final Section 4(e) condition number 23 requires the development of a Coarse Sediment Management Plan. The Coarse Sediment Management Plan described below, is incorporated into the Proposed Project that was submitted to the State Water Board for certification. The goal of the Coarse Sediment Management Plan is to provide an adaptive management framework for the collection, storage, and augmentation of coarse sediment into the lower McCloud River below McCloud Dam. The Coarse Sediment Management Plan requires monitoring of gravel and coarse sediment augmentation that could benefit downstream aquatic habitat in the lower McCloud River, as well as evaluation of possible gravel and coarse sediment sources. Implementation of the plan would require the addition of 150 to 600 tons of gravel and coarse sediment to the lower McCloud River below McCloud Dam. The anticipated source of the gravel and coarse sediment is the Star City Creek delta in McCloud Reservoir.

Under condition 23 of the USFS Final Section 4(e) Conditions, the Coarse Sediment Management Plan will include the following components:

- > Identify the source(s) of coarse sediment;
- > Identify the location(s) for coarse sediment introduction, and the facilities or improvements necessary for accessing the Lower McCloud River below McCloud Dam;
- > Identify coarse sediment storage sites;
- > Develop a schedule for coarse sediment placement; and
- > Include an adaptive management component to allow non-delivery of coarse sediment in non-spill years or in years when spring flows are insufficient to mobilize the sediment from the placement site(s) or increased augmentation above the minimum 150 tonnes if mobilization and dispersal monitoring results indicate capacity for greater quantities of coarse sediment.

If practical, the excavation of coarse sediments from the Star City Creek delta would only occur once or twice over the term of the new license. Gravel and coarse sediments would only be excavated from within the dry portion of the Star City Creek delta, once the water line is below the area accessible to ground-based equipment. Coarse sediments are defined as sediment ranging in size from approximately 8 to 128 mm. Sorting of the material would be required in order to remove the portion of material composed of sand and finer particles (0-8 mm). A gravel shaker machine or similar mechanical device would be used to accomplish the sieving and size sorting process. Material larger than 128 mm and smaller than 8 mm would be sorted out and would not be used. PG&E would have the option of transporting all of the sediment to a storage area(s) and sorting it in the storage area(s) or sorting the material on-site in the Star City Creek delta and transporting only the sorted material to the storage area(s). Any non-suitable material left on-site may be used for recreation development at this site as per the Recreation Development Management Plan (e.g., beach sand). Dump trucks or lowboys may be used to transport material to the storage area(s).

While Tarantula Gulch appears to be a potentially suitable source for coarse sediment, the volume of material available at the Star City delta (roughly 16,200 tons) is estimated to meet the total Proposed Project need (Nevares and Stallman 2010). As a result, it is assumed that the Star City Creek delta would be the sole source of coarse sediment; however, all descriptions of activities for the Star City Creek delta would also apply to the Tarantula Gulch delta if it becomes a future source for coarse sediment during the license term. Using coarse sediment from the Tarantula Gulch delta would only be pursued in the event that using the Star City Creek delta deposit is found to be infeasible at any point over the duration of the License.

Areas within the delta where sediments are extracted would be re-contoured to remove hazards or obstacles, and all temporary access roads to the reservoir inlet would be closed. If coarse sediment sorting occurs in the Star City Creek delta, the remaining material (e.g., non-suitable material) would be treated according to one of the following procedures: (a) re-contour over the delta so as to not create obstacles for boaters and recreationists, and to open water passage to the Star City Campground and Day Use Area during low water periods; or (b) remove and haul to a disposal site. The final treatment would be determined in consultation with resource agencies.

Once coarse sediment is placed in the lower McCloud River, it will be transported downstream by high flows prior to a subsequent coarse gravel augmentation event. Flow events large enough to mobilize gravel do not occur every year; therefore, it is unlikely gravel augmentation would take place in consecutive years. During years when augmentation is implemented, the gravel will be hauled from the storage area at the Hawkins Creek Tunnel Crossing to the base of McCloud Dam. It is anticipated that 24 truckloads will be required to haul the planned 600 tons of gravel from the storage area to the river.

Gravel augmentation would be completed consistent with spill prevention and Best Management Practices (BMPs). Appropriate spill equipment would be kept onsite to contain and clean up any spill caused by equipment failure. No petroleum products, chemicals or other hazardous material would be allowed to enter or be disposed of in a manner that it could enter the McCloud Reservoir or McCloud River. There would be no fueling, lubrication, or maintenance of equipment within at least 500 feet of McCloud Reservoir or the McCloud River.

2.4.6.3 Historic Properties Management Plan

In its final EIS, FERC determined the Historic Properties Management Plan that PG&E filed on January 26, 2010 to be final. On May 20, 2011, FERC and the California State Historic Preservation Officer executed the Programmatic Agreement to implement the final Historic Properties Management Plan.

The Historic Properties Management Plan, which has been incorporated into the Proposed Project presented to the State Water Board for certification, outlines continued adherence to federal and state laws and regulations, and regular communication with other agencies, the Pit River Tribe, and the Winnemem Wintu Tribe regarding the management of historic properties within the Project's Area of Potential Effect (APE). The APE is the study area as identified for the Proposed Project in consultation with the California Office of Historic Preservation. The Historic Properties Management Plan also specifies general treatment measures for: operations and maintenance (including road maintenance); the management of ethnobotanical resources; avoidance, monitoring, stabilization, data recovery, curation, and other treatment measures pertaining to historic properties; and accidental discovery of archaeological sites or human remains. The use of qualified Tribal Cultural Monitors is required during archaeological surveys, site testing, data recovery, non-emergency construction, and maintenance activities requiring ground disturbance that would create a reasonable effect to historic properties, and during long-term historic properties monitoring. Other protocols and procedures that are also provided in the Historic Properties Management Plan include educating the public and PG&E staff on protecting cultural resources, inadvertent discoveries, emergency situations, curation of recovered cultural materials, future studies, Project patrolling, monitoring of cultural resources, and general consultation. The stipulations in the Historic Properties Management Plan are enhanced by USFS Final 4(e) condition number 34. In addition, PG&E will determine the eligibility of the existing hydroelectric facilities for inclusion on the National Register of Historic Places and California Register of Historic Resources at the time of license issuance and when the McCloud-Pit Project facilities are 50 years old.

2.4.6.4 Erosion and Sediment Control Management Plan

USFS Final Section 4(e) condition number 22 requires the development of an Erosion and Control Sediment Management Plan. The Erosion and Sediment Control Management Plan described below, is incorporated into the Proposed Project that was submitted to the State Water Board for certification. The Erosion and Sediment Control Management Plan will inventory, record, treat, and monitor erosion and sedimentation impacts within the Project area and on Project-affected USFS lands and waters; and minimize future erosion and sedimentation using PG&E BMPs and USFS regulations and guidance.¹⁰

Under condition 22 in the USFS Final Section 4(e) Conditions, the Erosion and Sediment Control Management Plan will include, but may not be limited to the following components:

- > Methods for initial and periodic inventory and monitoring of the entire Project area and Project-affected National Forest Service lands to identify erosion sites and assess site condition for each, using protocols established in relicensing study GS-S1 (Nevares et al. 2009). Periodic monitoring and inventory will include recording effectiveness of erosion treatment measures, and identification of new erosion sites for the term of the new license;
- > Criteria for ranking and treating erosion sites, including a risk rating and hazard assessment for scheduling erosion treatment measures and monitoring at each site using protocols developed in relicensing study GS-S1 (Nevares et al. 2009);
- > Erosion control measures that incorporate current standards, follow USFS regulations and guidance (e.g., Land and Resource Management Plan, Road Management Objectives [RMOs], BMPs), are customized to site-specific conditions, and approved by the USFS;
- > Develop and implement a schedule for treatment (e.g., repair, remediate, monitor) of erosion sites, including a list of sites requiring immediate attention and a schedule for implementation. Priority will be placed on the 56 sites ranked as having high erosion potential in study results from GS-S1 (Nevares, Stallman, and Bowers 2009). All sites (high, moderate, and low priority, and any new sites added as a result of periodic monitoring) will be scheduled for treatment as described in the Implementation Plan (Exhibit Erosion and Sediment Control Management Plan);
- > Effectiveness monitoring of completed erosion control treatment measures for a period of up to three years after treatment in order to determine if further erosion control measures are needed;
- > Protocols for emergency erosion and sediment control; and
- > Process for documenting and reporting inventory and monitoring results, including periodic plan review and revision. Documentation shall include a USFS compatible GIS database for maps keyed to a narrative description of detailed, site-specific, erosion treatment measures and sediment monitoring results.

¹⁰ *Water Quality Management for Forest System Lands in California* (USFS 2000) provides a set of standardized BMPs to protect water quality during the planning and construction of projects. The BMPs are organized into eight land use activity categories including Road and Building Site Construction and Watershed Management.

2.4.6.5 Fire and Fuels Management Plan

USFS Final Section 4(e) condition number 33 requires the development of a Fire and Fuels Management Plan. The Fire and Fuels Management Plan described below has been incorporated into the Proposed Project submitted to the State Water Board for certification, and will provide information necessary for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Project. The Fire and Fuels Management Plan will also identify the following: hazard reduction/fuel treatment measures; actions and locations of resources needed for fire prevention and response; and a process for reporting fires and providing necessary documents associated with any fire investigation to protect the Proposed Project and USFS resources over the term of the license.

Under condition 33 in the USFS Final Section 4(e) Conditions, the Fire and Fuels Management Plan will include, but may not be limited to the following components:

- > Fuels treatment;
- > Prevention and response;
- > Access and safety;
- > Emergency response preparedness;
- > Reporting and response;
- > Investigation of Project related fires; and
- > Post-fire activities.

Other aspects of fuels management primarily related to vegetation treatments, including powerline clearance, are contained in the Vegetation and Invasive Weed Management Plan (see Section 2.4.6.12 below).

2.4.6.6 Large Woody Debris Management Plan

USFS Final Section 4(e) condition number 21 requires the development of a Large Woody Debris Management Plan. The Large Woody Debris Management Plan has been incorporated into the Proposed Project submitted to the State Water Board for certification, and will provide a framework and guidelines for the removal of large woody debris (LWD) from McCloud Reservoir, and subsequent placement of LWD into the McCloud River below the McCloud Dam to augment recruitment of wood during high water flows, and contribute to the amount and quality of aquatic habitat along channel margins and in riparian habitat above the low-flow channel. Under condition 21 in the USFS Final Section 4(e) Conditions, the Large Woody Debris Management Plan will specify: (a) size criteria; (b) storage and placement sites; and (c) volume and frequency of placement, including monitoring procedures that assess the mobilization of LWD from the augmentation site. Refer to Figure 2-5 for proposed LWD sites.

Figure 2-5 Large Woody Debris Sites



2.4.6.7 Recreation Development and Management Plan

USFS Final Section 4(e) condition number 30 requires the development of a Recreation Development and Management Plan. The Recreation Development and Management Plan has been incorporated into the Proposed Project submitted to the State Water Board for certification, and describes the specific tasks, components, and products that will guide the management of recreation resources and opportunities associated with the Proposed Project. Under condition 30 in the USFS Final Section 4(e) Conditions, the Recreation Development and Management Plan will include, but may not be limited to the following components:

- > Operation and Maintenance: Development and implementation of an Operation and Maintenance component (including fee collection and retention) for all Project recreation facilities.
- > Recreation Survey and Monitoring: Development and implementation of a periodic Recreation Survey and Monitoring component with a report that is filed with FERC after USFS approval.
- > Project Patrol: Development and implementation of a Project Patrol Plan for Project and Project-affected USFS lands.
- > Reservoir Water Surface Management: Development and implementation of a Reservoir Water Surface Management component that addresses recreation user safety (including surface debris capture), discourages travel onto adjacent private lands, and displays County code and contact information to Project users at each Reservoir surface (McCloud, Iron Canyon, Pit 6 and Pit 7).
- > Construction and Reconstruction for Recreations: Construction and reconstruction of several recreational facilities near McCloud Reservoir, McCloud River below McCloud Dam, Iron Canyon Reservoir, Pit 6 Reservoir, and Pit 7 Reservoir and Afterbay (described in more detail in Section 2.4.3 of this draft IS/ND).

PG&E would be required to provide water level information for McCloud and Iron Canyon Reservoirs to the public to inform visitors when conditions are suitable for launching boats. PG&E would also be required to provide real-time water flow information on the internet (gage MC-1 at Ah-Di-Na) for the McCloud River below McCloud Dam to inform the public when water flows are suitable for whitewater boating. PG&E has implemented this measure to provide real-time public flow information, which is available at: http://cdec.water.ca.gov/dynamic/app/staMeta?station_id=MCA.

2.4.6.8 Road and Transportation Facility Management Plan

USFS Final Section 4(e) condition number 29 requires the development of a Road and Transportation Facility Management Plan. The Road and Transportation Facility Management Plan has been incorporated into the Proposed Project submitted to the State Water Board for certification, and describes the scope of road maintenance, improvements, and monitoring needed to meet new license conditions, and USFS RMOs and traffic service levels applicable to Proposed Project roads. Under condition 29 in the USFS Final Section 4(e) Conditions, the

Road and Transportation Facility Management Plan will include, but may not be limited to the following components:

- > **Planning and Inventory:** A map(s) compatible with USFS Travel Management Routes and GIS database showing all Project roads and associated road signs within, adjacent, or specific to the Project Boundary.
- > **Operation, Maintenance, and Road-Associated Debris:** An annual road operation and maintenance schedule for Project roads that complies with USFS standards, RMOs, BMPs, Limited Operating Periods, and USFS Travel Management Rule.
- > **Construction and Reconstruction for Roads:** Construction and reconstruction implementation schedule to bring existing roads and associated facilities into compliance with USFS standards (including RMOs and the USFS Travel Management Rule).
- > **Monitoring:** Conduct periodic traffic use surveys and periodic road capacity reviews. If the USFS determines roads no longer meet the RMOs, define actions and timelines to correct deficiencies.

2.4.6.9 Sign and Interpretive/Education Plan

USFS Final Section 4(e) condition number 31 requires the development of a Sign and Interpretive/ Education Plan. The Sign and Interpretive/Education Plan has been incorporated into the Proposed Project submitted to the State Water Board for certification and establishes overall design guidelines and maintenance standards for existing and Proposed Project-related signs, and will also enhance public understanding of Project-affected resources through interpretive and educational measures. These signs, collectively referred to as “Project-Related Signs”, include signs related to information, direction/orientation, FERC, safety, fire and fire prevention, recreation, cultural and other resources, interpretive and education, and web media. Under condition 31 in the USFS Final Section 4(e) Conditions, the Sign and Interpretive/Education Plan will include, but may not be limited to the following components:

- > Inventory of all existing informational, FERC, safety, directional, recreation, interpretive, and education (all non-road or traffic) signs within the Project area or associated with Project facilities.
- > Collaborative development of standards, designs, and locations for all Project-Related Signs (existing and new), including web media.
- > Protocols for installing, maintaining, and monitoring Project-Related Signs for the life of the license.

The Project-Related Signs pertain directly to Proposed and Existing Project facilities, use, amenities or opportunities and may be located within the Project area, on Project roads, on USFS lands, or along roads external to the Project area. The only signs not addressed in this Plan are road and traffic-related signs associated with roads external to recreation sites. Traffic-related signs are included in the Road and Transportation Facility Management Plan.

2.4.6.10 Terrestrial Biological Management Plan

USFS Final Section 4(e) condition number 26 requires the development of a Terrestrial Biological Management Plan. The Terrestrial Biological Management Plan has been incorporated into the Proposed Project submitted to the State Water Board for certification, and outlines the specific tasks, components, and products for monitoring and surveying terrestrial wildlife species on Project lands and USFS lands potentially affected by the Proposed Project and specifies the measures to protect both the species and their habitat. Special-status wildlife species potentially affected by Project activities include those that are federally threatened, endangered or proposed, and those categorized as USFS-sensitive species, including those listed for Survey and Manage, state-listed as endangered, California threatened, California species of special concern, or California fully protected species. Pre-construction monitoring and survey results will be used to determine whether Project-related activities could impact these special-status species or their habitat, and if there is a need to adjust environmental measures specified in the license. The list of special-status species will be reviewed annually and updated as needed to include newly listed or remove delisted species. Under condition 26 in the USFS Final Section 4(e) Conditions, the Terrestrial Biological Management Plan will include, but may not be limited to the following components:

- > Periodic surveys (including pre-disturbance/pre-construction);
- > Occupation and population monitoring;
- > Species specific mitigation measures (including avian collision and electrocution hazard prevention measures); and
- > GIS mapping and reporting.

Species to be monitored include terrestrial mollusks, Shasta salamander, western pond turtles, northern goshawk, bald eagles, peregrine falcon, northern spotted owl, willow flycatcher, special status bats, neo-tropical birds, and forest carnivores. Additional species may be added in the future if required by law or regulation, and if suitable habitat occurs within the Project or Project-affected area. Surveys for valley elderberry longhorn beetle will occur under the Vegetation and Invasive Weed Management Plan and are habitat-only surveys.

2.4.6.11 Vegetation and Invasive Weed Management Plan

USFS Final Section 4(e) condition number 25 requires the development of a Vegetation and Invasive Weed Management Plan. The Vegetation and Invasive Weed Management Plan has been incorporated into the Proposed Project submitted to the State Water Board for certification and will establish overall management and monitoring actions to protect and encourage native vegetation establishment on Project-affected lands, minimize invasive weeds, and manage vegetation that affects Project facilities. Under condition 25 in the USFS Final Section 4(e) Conditions, the Vegetation and Invasive Weed Management Plan will include, but may not be limited to the following components:

- > Protection of special-status and revegetation source populations;
- > Invasive species management and monitoring, including an adaptive management element to implement methods for prevention of aquatic invasive weeds, as necessary;

- > Revegetation implementation and monitoring;
- > Treatment protocols for vegetation management and hazard reduction for protection of Project facilities and Project-affected resources within the Project affected area;
- > Pesticide/herbicide use approval and restrictions; and
- > Botanical enhancements for specific special-status wildlife species.

In addition, the Vegetation and Invasive Weed Management Plan will include an adaptive management element which may include, but may not be limited to, public education and signing of public boat access and preparation of an Aquatic Plant Management component of the plan. The Vegetation and Invasive Weed Management Plan will not address Project-related vegetation management treatment for vehicular sight distance, which is addressed in the Road and Transportation Facility Management Plan, or fuels treatments around Project facilities, which is contained in the Fire and Fuels Management Plan.

2.4.6.12 Visual Quality Management Plan

USFS Final Section 4(e) condition number 32 requires the development of a Visual Quality Management Plan. The Visual Quality Management Plan is not considered a standard “plan,” but rather is a list of measures and a timeline to implement the measures since there is general agreement between PG&E and the USFS that specific measures are known and understood. The Visual Quality Management Plan has been incorporated into the Proposed Project submitted to the State Water Board for certification and will be implemented to meet USFS Visual Quality Objectives to assure Project-affected resources that are on or affecting USFS lands blend with the natural environment.

The goal of the Visual Quality Management Plan is to comply with laws, standards, and USFS policy for visual (scenery) management, including the Shasta-Trinity Land and Resource Management Plan’s guidance for “sensitive viewing areas.” The Visual Quality Management Plan will address operation and maintenance of existing facilities, reconstruction of existing facilities, and construction of new facilities. In addition, PG&E will be required to provide updated photo at key observation points. Under condition 32 in the USFS Final Section 4(e) Conditions, the Visual Quality Management Plan will include, but may not be limited to the following components:

- > Operation and maintenance of existing facilities;
- > Reconstruction or repair of existing facilities;
- > Construction of new facilities; and
- > Key observation point monitoring.

In addition, several of the other plans described above will provide information related to implementation of the Visual Quality Management Plan, including the Recreation Development and Management Plan, Sign and Interpretation/Education Management Plan, Fire and Fuels Management Plan, Vegetation and Invasive Weed Management Plan, Road and Transportation Facilities Management Plan, and Erosion and Sediment Control Management Plan.

2.4.6.13 Water Quality and Temperature Monitoring Plan

USFS Final Section 4(e) condition number 20 requires the development of a Water Quality and Temperature Monitoring Plan with requirements that focus on aquatic habitats and water-based recreation on USFS lands. The Water Quality and Temperature Monitoring Plan has been incorporated into the Proposed Project and submitted to the State Water Board for certification. PG&E's license application included a proposed draft Water Quality Monitoring Plan to identify potential Proposed Project impacts on water quality. Under condition 20 in the USFS Final Section 4(e) Conditions, the Water Quality and Temperature Monitoring Plan will include, but may not be limited to the following components:

- > Monitoring all project reservoirs every five years for contaminants at appropriate key recreation locations (e.g. boat ramps, day use areas, near campgrounds), including *E.coli*, to measure possible sanitation concerns;
- > Periodic monitoring of dissolved oxygen at McCloud, Pit 6, and Pit 7 Reservoirs;
- > Temperature monitoring from May 1 through September 30, at a minimum, for a period of ten years following implementation of the new license instream flow schedule. Monitoring to be conducted by Project segments (i.e., reservoirs and Project-affected rivers) are subject to the following:
 - Permission to enter private lands during sensor installation/maintenance, as applicable;
 - Routine sensor maintenance or deployment in the spring may be delayed due to late snows or high flows and will be initiated as early in May as possible, subject to safety and access constraints; and
 - If monitoring indicates that temperatures above 20°C are occurring within the Project reservoirs or downstream reaches, additional monitoring may be required;
- > Continuous monitoring of turbidity for the term of the license in the Lower McCloud River (at MC-7 or MC-1) during fishing season (approximately April 25 to November 15) to record elevated turbidity for recreational use.
 - Routine sensor maintenance or deployment in the spring may be delayed due to late snows or high flows and will be completed prior to or as early in the fishing season as possible, subject to safety and access constraints; and
 - Turbidity levels will be available real-time during the fishing season on the PG&E's public Project website;
- > Turbidity monitoring during construction, re-construction, or other soil disturbing activities to identify point source erosion that may require repair or stabilization;
- > Continuous monitoring of turbidity for a minimum of five years after license acceptance in Iron Canyon Creek (at MC-10) to ensure that PG&E's repairs have reduced sedimentation into the creek below the dam. If elevated turbidity (above Basin Plan levels) is still occurring after five years, continue monitoring for an additional five years until additional mitigations reduce turbidity to or below Basin Plan levels. If, before the end of five years, PG&E proposes and the USFS and other applicable conditioning agencies agree and approve that

PG&E's erosion control repairs have effectively reduced sedimentation and turbidity below the dam, then turbidity monitoring at this location can cease; and

- > Implementation of BMPs, or the most current USFS regulations, within the Project and Project-affected area that will satisfy the Aquatic Conservation Strategy Objectives within the Northwest Forest Planning area, and govern implementation of:
 - Project operation and maintenance activities;
 - Project construction, reconstruction, and repair of Project sites;
 - Developed and dispersed recreation use;
 - Road use, routine maintenance, reconstruction and repair;
 - Vegetation manipulation;
 - Prescribed fire and wildland fire planning and fire suppression; and
 - Watershed practices.

2.4.7 Proposed Project Schedule

The only new physical components of the Proposed Project are the proposed new and improved recreation facilities (refer to Table 2-3). Construction of the proposed recreation facilities would be scheduled for the months of August, September, October, and November, depending on location (refer to Table 2-3). This construction period is required to comply with limited operating periods for protection of wildlife species. Construction would be scheduled after issuance of the new FERC license, and is contingent on FERC approving the Recreation Development and Management Plan.

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3 Environmental Checklist

3.1 Introduction

This chapter incorporates the Environmental Checklist contained in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Each resource topic section includes a description of the environmental setting, an explanation of the checklist's impact questions, and identification of the thresholds of significance for each question. In addition, each section describes project components relevant to the section, including components proposed: (a) by Pacific Gas and Electric Company (PG&E) in its license application; (b) in the terms and conditions contained in the Federal Energy Regulatory Commission's (FERC's) final Environmental Impact Statement (EIS), Appendix D – Commission Staff Recommended Conditions; and (c) in the United States Department of Agriculture – Forest Service (USFS) 4(e) Conditions; all of which have been incorporated into the Proposed Project that is before the State Water Board for certification. Refer to Chapter 2 for additional Proposed Project information.

3.2 Evaluation of Environmental Impacts

The following description of the existing environmental setting relies largely on FERC's final EIS for the McCloud-Pit Hydroelectric Project (McCloud-Pit Project or Project) (FERC 2011), which is incorporated by reference. As needed, supplemental information and analysis of potential environmental impacts is provided herein to meet the requirements of CEQA.

Each resource area is evaluated against the significance criteria provided by CEQA Appendix G¹¹ and each impact is assigned a level of significance. The varying levels of significance are defined as:

- > **Potentially Significant Impact:** This level of significance is used for impacts that would exceed identified thresholds and where mitigation that would reduce the significant impact may not be available or feasible. Under this circumstance, an Environmental Impact Report is required.
- > **Less than Significant with Mitigation Measures:** This level of significance is used for impacts that would meet or exceed the identified thresholds, but by implementing mitigation measures would reduce such impacts to less than significant.
- > **Less than Significant:** This level of significance is used for impacts that would occur, but whose degree would not meet or exceed the identified thresholds.
- > **No Impact:** This level of significance is used for impacts where clearly no effect would occur. Where it was clear at the outset that no impact on a particular resource would occur under any of the alternatives, the resource was evaluated at a lesser level of analysis.

¹¹ Revised December 28, 2018.

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3.2.1 Aesthetics

Except as provided in Public Resources Code section 21099, subd. (d) (which provides that aesthetic impacts shall not be considered significant for qualifying residential, mixed-use residential, and employment center projects on infill sites within transit priority areas) would the Project:

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Have substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

The Proposed Project Study Area includes those areas that could be affected by Project operation and maintenance. For aesthetic impacts this includes all recreational facilities, including reservoirs and trails, and viewsheds of forest resources from various points within the Project area. Generally, the Project area is characterized by steep, densely forested topography in a remote scenic setting with minimal road access. Interspersed within the canyons are water bodies including reservoirs linked together by reaches of the McCloud and Pit Rivers, as well as a water pipeline that is above or below ground in different areas. Although the public has identified scenic quality as one of its primary reasons for visiting the existing recreational facilities (PG&E 2008), scenic vistas throughout the area are limited by topography and vegetation.

At McCloud Reservoir, observation points reasonably available to the public are from the reservoir surface. The natural landscape dominates the views throughout the area, with human-made facilities limited to the earth-filled McCloud Dam, Tarantula Gulch boat ramp recreation area, McCloud Tunnel intake, and public and private roads.

Iron Canyon Reservoir is situated at the confluence of five small creek tributaries, creating a relatively shallow, five-fingered-shaped reservoir with waters extending into the narrow coves created by the stream channels. Dense evergreen forests, which cover the surrounding hill slopes, obscure most views of the reservoir from nearby roads; however, some open views of the water occur. Open landscape-scale views are provided at both developed and dispersed recreation areas located around the perimeter of the reservoir and from the water surface.

Along the Pit River, James B. Black Powerhouse is located on the north bank of the Pit River less than three miles downstream from the town of Big Bend. Views of the powerhouse are possible from points along the Pit River in proximity to the powerhouse, as well as from a small portion of Oak Mountain Road, a USFS road that provides access between Iron Canyon Reservoir, the Pit River and James B. Black Powerhouse. Vegetation and topography screen views of the powerhouse from any considerable distance. Transmission lines leaving the powerhouse and the penstock that supplies water to the powerhouse are visible from nearby locations.

Pit 6 and Pit 7 Reservoirs are long, narrow, and confined within the walls of the canyon, with dense vegetation and steep topography obscuring views of the reservoirs. The Pit 7 Afterbay, the most visible water feature within the Pit River portion of the Project, is visible from Fenders Ferry Road (FR 34N17) where it crosses the Pit River arm of Shasta Lake and from the car-top boat launch area at Fenders Ferry. Uplands surrounding the river are heavily forested with evergreen oak woodland and pine vegetation. When Shasta Lake is at full pool, the reservoir overtops the Pit 7 Afterbay Dam, changing the character of the area to one of flat water as opposed to a flowing river.

Additional information regarding aesthetic resources in the Project area is provided in FERC's final EIS (FERC 2011), Section 3.3.7, *Land Use and Aesthetic Resources*, pages 327 through 330.

Visual Quality Objectives

The USFS provides preferred Visual Quality Objectives (VQOs) for its lands managed under the Shasta-Trinity National Forest (STNF) Land and Resource Management Plan. Project area lands within the STNF are currently classified as either Retention or Partial Retention (FERC 2011).

Retention VQOs promote landscapes that are perceived by the public as having an intact natural or natural-looking character. Human-made changes to these landscapes should not result in noticeable changes in form, color, or texture from those of the naturally occurring viewshed.

The USFS's Land and Resource Management Plan (USFS 1995) for the STNF specifies VQOs (USFS 1987) for lands within the Project area as being managed for either Retention or Partial Retention (PG&E 2009a). Under these VQOs, management activities, when viewed by the public, should have an intact natural or natural-looking character. The VQO classification of Modification, for which the appearance of moderately altered landscape character is allowable, will also be used to blend existing facilities with the natural surroundings (FERC 2011).

Partial Retention VQOs allow for more alteration of the landscape, but changes in forms, color or texture should not be dominant and should be subdued by the natural character of the area. FERC's final EIS (Table 3.42 in Section 3.3.7, *Land Use and Aesthetic Resources*, page 330), summarizes VQOs by general Project area.

Discussion

a. Have substantially adverse effect on a scenic vista?

Impact: Less Than Significant

Following is a summary of the potential effects of the Proposed Project on scenic vistas associated with the Proposed Project area. Effects would be considered substantial and adverse if they result in a permanent alteration of the visual character of scenic vistas used by the public in a manner that considerably reduces the aesthetic value of the vistas, or that would violate VQOs established by the USFS.

- > McCloud Reservoir. The natural landscape is predominant, with human-made facilities, including the earth-filled McCloud Dam, Tarantula Gulch Boat Ramp recreation area, the McCloud Tunnel intake, and private and public roads. Informal fishing access pullouts and trails are adjacent to FS11 Road at several locations around the perimeter of the reservoir. Scenic views of the reservoir from FS11 Road and recreation areas are obstructed by vegetation and topography; however, views from the water's surface of the surrounding Proposed Project area are more expansive, but also restricted by the steep forested hillsides that border the narrow, winding fingers of the reservoir.

The Proposed Project includes changes in water flow regimes, road improvements, and recreation facilities improvements requiring vegetation removal and other ground disturbing activities. These changes could temporarily and permanently alter the visual character of scenic views from the water's surface looking toward the areas affected by the Proposed Project (e.g., toward a recreation facility or shoreline). Scenic views from uplands are less likely to be impacted by the Proposed Project

because the appearance of most changes would be buffered by topography, distance, and vegetation. Because McCloud Reservoir is one of the most popular public recreation destinations in the Proposed Project area, changes in the reservoir's elevation would be noticeable, particularly the "bathtub ring" effect (i.e., exposed, unvegetated shoreline contrasting sharply in color and texture with the natural quality of the surrounding landscape). However, periodic drawdown is an ongoing action and is usually timed to occur in the fall, winter, and early spring months when fewer visitors come to the area. These effects are also diminished somewhat by the steep shoreline, which leaves a relatively narrow band of exposed shoreline when compared to areas having less slope angle. The Proposed Project instream flows are not expected to result in noticeable changes to water levels in McCloud Reservoir because the additional releases represent a small fraction of total reservoir storage, which will be replenished by inflow from the McCloud River, and so the bathtub ring effect under the Proposed Project operations would be similar to the existing Project operation. Impacts to scenic vistas from reservoir surface would therefore not be significant.

There is potential for a significant impact on scenic views within the McCloud Reservoir facilities area, specifically the Star City Creek Arm, where coarse sediment extraction activities are proposed during draw down of the reservoir in the fall and a new campground facility and access road would be constructed at the head of the arm. For coarse gravel extraction, effects on scenic views of the Star City Creek arm would be temporary and confined to the immediate area. Vegetation, distance, and topography would obstruct most views of these temporary activities. Following extraction of coarse sediments, the areas would be re-contoured to blend with surrounding areas. It is anticipated that gravel extraction activities would be completed before construction of a new campground facility and associated access road adjacent to the Star City Creek arm are constructed. Because the aesthetic effect of the sediment extraction will be temporary and, given the remoteness of the location and the absence of a developed recreation area, unlikely to be visible to the public, the effect will not be significant.

As discussed above, changes in flows downstream of McCloud Dam would not noticeably alter the existing visual environment and therefore, would have no impact on the any scenic vistas downstream on the Lower McCloud River.

- > Iron Canyon Reservoir. The area around Iron Canyon Reservoir is slightly less steep than the McCloud Reservoir area, thus allowing for more opportunities to view the region's open landscape and scenic vistas; however, similar to the rest of the Project area, dense mature forests dominate the surrounding mountains and reservoir shoreline. Scenic vistas are limited, but where they do occur, consist of the open water, forested shoreline, and distant mountains that are visible from some developed and dispersed recreation areas, from the water's surface, as well as from parts of FS11 Road and USFS Road 37N78, which follow the entire Iron Canyon Reservoir shoreline. However, the contiguous forest surrounding the reservoir, coupled with distance and topography, would obstruct views of most, if not all, of the

Proposed Project activities in uplands, including localized vegetation removal and facilities associated with proposed new and rebuilt recreation facilities. Still, the implementation of Proposed Project components and ongoing operation of the Proposed Project raise the possibility of significant effects on some scenic vistas located around the reservoir.

Iron Canyon Reservoir receives moderate to high numbers of public visitors annually. Changes in the reservoir's surface elevation, specifically drawdown operations, are readily noticed by the public because of its gentler sloping banks that have the potential to expose a broad bathtub ring of mudflats, which contrast sharply in color and texture with the adjacent uplands. However, under the Proposed Project (including changes in the instream flow regime) the extent of releases and drawdowns will not result in a noticeable change to the bathtub ring over existing conditions, and so the impact of the Proposed Project on the existing bathtub ring will not be significant.

PG&E currently conducts on-going vegetation management activities along its 230-kilovolt (kV) transmission line, which extends 0.5 mile from the James B. Black Powerhouse to the non-Project Pit 5 Powerhouse, and a 12-kV distribution line that runs 10.22 miles from the James B. Black Powerhouse to Iron Canyon Dam. As part of the Proposed Project, PG&E would continue to implement similar vegetation management actions. Since the areas along these transmission and distribution lines have already been modified, future vegetation management actions would not represent a change from existing conditions; therefore, the impact would not be significant.

As discussed above, changes in flows downstream of Iron Canyon Dam would not noticeably alter the existing visual environment and therefore, would not impact any scenic vistas downstream of the dam.

- > Pit 6 and Pit 7 Reservoir. Pit 6 and Pit 7 Reservoirs are located in the very steep and remote Pit River Canyon. Neither reservoir is readily visible or easily accessible to the public. Access to Pit 6 Reservoir is limited to foot traffic or potentially by boat from the Pit River upstream (for safety, this is discouraged by PG&E). Dense vegetation and narrow, steep canyon topography preclude views of these reservoirs from most locations and the difficult public access also limits views of the Project area from the waters' surface. Transmission lines leaving the James B. Black Powerhouse and penstock that supply water to the powerhouse are visible from nearby locations. The Pit 6 Dam and Powerhouse are visible from points along the last mile of the Pit 6 Road as it descends into the Pit River Canyon. The Proposed Project includes creation of a pedestrian trail near Pit 6 and Pit 7 Reservoirs. Under existing conditions this visual character of this area has been noticeably disturbed by human activity, including visible Project transmission lines, powerhouses, and penstocks. The visual effect of the addition of the pedestrian trail will blend with the existing disturbances, and so the impact will not be significant.

The Proposed Project would not change instream flow releases from the dam or reservoir operations, including drawdowns of the Pit 6 and Pit 7 Reservoirs. In addition, drawdowns of these reservoirs have less effect on aesthetic resources than that of McCloud or Iron Canyon Reservoirs because these reservoirs are rarely seen by the public (PG&E 2009a).

PG&E currently conducts on-going vegetation management activities along their existing 230-kV transmission line (a 3.3-mile segment from Pit 6 Powerhouse to PG&E's interconnected transmission system, and a 3.5-mile segment from Pit 7 Powerhouse to PG&E's interconnected transmission system). As part of the Proposed Project, PG&E would continue to implement similar vegetation management actions. Since the areas along these transmission and distribution lines have already been modified, future vegetation management actions would not be out of character with existing conditions; therefore, this impact would be less than significant.

- > Pit 7 Afterbay. The Pit 7 Afterbay is the most visible water feature in the Pit River portion of the Proposed Project area, specifically where Fenders Ferry Road (USFS Road 34N17) crosses over the Pit River arm of Shasta Lake and from the car-top boat launch at Fenders Flat (PG&E 2009a). Under existing conditions, releases from the Pit 7 Afterbay Dam via its v-notched weir affect the character of water flows in the Pit River, as seen by the public. Water flowing from the Pit 7 Afterbay appears as riverine when Shasta Lake levels are low, and as flat water when Shasta Lake levels overtop the afterbay dam (PG&E 2009a). Although the Pit 7 Afterbay receives little public use, Proposed Project activities such as the proposed road and parking area improvements raise the possibility of a potentially significant impact on the scenic vista afforded to the public using the Fenders Ferry Road Bridge. From this location, viewers can see an expansive view of the Pit 7 Afterbay and Dam set against the surrounding forest and mountains. Due to potential hazards and public safety issues associated with fluctuating flow releases and the v-notched weir, the entire Pit 7 Afterbay is fenced on both sides with an 8-foot high chain link fence, and the area immediately around Fenders Flat and the boat launch is heavily signed with warnings alerting the public to the potential hazards of the area. A siren tower is also located at Fenders Flat.

Not all Proposed Project activities would be completed concurrently, and most would be completed in less than 2 months. The Proposed Project that is before the State Water Board for certification includes development and implementation of the Visual Quality Management Plan agreed to by PG&E and the USFS. The goal of the Visual Quality Management Plan is to meet laws, standards and USFS policy for visual (scenery) management, including Shasta-Trinity Land and Resource Management Plan guidance for "sensitive viewing areas." The Visual Quality Management Plan addresses operation and maintenance of existing facilities; reconstruction of existing facilities; and construction of new facilities. In addition, PG&E will update photo points at Key Observation Points (KOPs), which is required per USFS VQOs (USFS 2010b). Refer to Chapter 2, Proposed Project for specific required measures

addressing Proposed Project operations and maintenance, reconstruction of existing facilities, and construction of new facilities. Additional analysis of the Visual Quality Management Plan can be found in FERC's final EIS (FERC 2011), Section 3.3.7, *Land Use and Aesthetic Resources*, pages 338 through 339. With implementation of the Visual Quality Management Plan component of the Proposed Project, the Proposed Project will not result in the violation of any VQOs, and so the impact of the Proposed Project will not be significant. Overall, construction-related impacts to visual resources would be of short duration, and permanent impacts on visual resources as a result of implementation and operation of the Proposed Project would be reduced or avoided with measures developed in consultation with the resource agencies and defined in the Final Visual Quality Management Plan. The Proposed Project impacts that have a potential to substantially and adversely affect a scenic vista are less than significant.

Mitigation Measures: None required.

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Impact: No Impact

Impacts to scenic resources within state scenic highways would be considered substantial and significant if the impact considerably reduced the aesthetic value of the resources. However, because there are no designated state scenic highways located in the Proposed Project area (California Department of Transportation 2018), and because none of the Proposed Project facilities areas are visible from a state scenic highway, the Proposed Project will have no impact on scenic resources within a state scenic highway.

In addition, although the Proposed Project area lies within the STNF, none of the roads within the Project area are designated USFS Scenic Byways (Federal Highway Administration 2012). The few roads in the Project area are primarily USFS roads and are therefore subject to USFS VQOs as described in the STNF Land and Resource Management Plan (USFS 1995), which include monitoring of Project area views from KOPs. Several KOPs on Project area USFS roads have already been established as a part of the Aesthetic Resources Assessment prepared for the Proposed Project (PG&E 2008). The Proposed Project would not introduce any elements that would substantially degrade the existing visual character or quality of the Project area or its vicinity as seen from Project area roads.

Moreover, as discussed above measures developed by PG&E in consultation with the USFS and defined in the Final Visual Quality Management Plan will be implemented to meet USFS VQOs (USFS 2010b). Refer to Chapter 2, Proposed Project for specific required measures addressing Proposed Project operations and maintenance, reconstruction of existing facilities, and construction of new facilities. Additional analysis of the Visual Quality Management Plan can be found in FERC's final EIS (FERC 2011), Section 3.3.7, *Land Use and Aesthetic Resources*, pages 338 through 339.

Mitigation Measures: None required.

c. Substantially degrade the existing visual character or quality of the site and its surroundings?

Impact: Less Than Significant

Impacts of a project on the existing visual character or quality of the site and its surroundings would be considered substantial, and thus significant, if they would negatively affect the public's perception of the existing visual character or violate VQO's developed by the USFS.

The Proposed Project area lies within the remote, rugged, and densely forested McCloud River and Pit River canyons. The Proposed Project, including instream flow releases, road and trail improvements, signage, and campground improvements, would be localized and affect only the immediately surrounding area. These localized changes in the existing visual environment raise the possibility of a negative effect on the public's visual perception the Proposed Project area, particularly at McCloud Reservoir and Iron Canyon Reservoir, where public use is higher than the less accessible Pit 6 and Pit 7 Reservoirs and the Pit 7 Afterbay.

However, with implementation of the Visual Quality Management Plan component of the Proposed Project, localized changes on USFS lands resulting from the Proposed Project will comply with USFS VQOs (USFS 2010b). Refer to Chapter 2, Proposed Project for specific required measures addressing Proposed Project operations and maintenance, reconstruction of existing facilities, and construction of new facilities. Additional analysis of the requirements for the Visual Quality Management Plan can be found in FERC's final EIS (FERC 2011), Section 3.3.7, *Land Use and Aesthetic Resources*, pages 338 through 339. The impact of the Proposed Project on the existing visual character or quality of sites within the Project area and its surroundings will not be significant.

Mitigation Measures: None required.

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Impact: Less Than Significant

For the purposes of this element, impacts would be considered substantial, and thus significant, if the Proposed Project created a permanent new source of substantial light or glare which would violate applicable VQOs.

Potential sources of temporary daytime glare could be created during construction by Proposed Project related activities, including soil disturbance and the operation of construction equipment. Solar reflection from exposed mineral soils and glass windshields may be noticeable from long distances. An example of where this could occur would be within the Star City Arm of McCloud Reservoir, where coarse sediment extraction is

proposed. However, any light or glare created from sediment extraction or construction related activities under the Proposed Project would be temporary and not permanent.

The types of permanent sources of daytime glare that could result from implementation, operation, and maintenance of the Proposed Project are common in the Project area under existing conditions and existing Project operations. These sources include the changes in flow volumes and reservoir elevation levels resulting in the expanse of potentially reflective water and glare from fluctuating bathtub ring soils around reservoir shorelines; the developed recreation facilities improvements, such as potentially reflective new structures (e.g., bathrooms, signage, and concrete boat ramps); the creation of potentially reflective gravel-surfaced pedestrian trails; and the increased parking areas that could be a substantial source of glare from vehicles. The potential significance of these impacts would be expected to vary depending on the size of the affected area, the number of visitors affected, and the time of day. In addition, nighttime security lighting proposed at the Tarantula Gulch Boat Launch at McCloud Reservoir and the Gap Creek Campground and Iron Canyon Boat Launch at Iron Canyon Reservoir would be a permanent, locally significant year-round source of nighttime lighting, a potential significant impact. Nighttime recreational use of Project area campgrounds raises the possibility of the creation of a substantial new source of seasonal nighttime lighting. It is not anticipated that there would be a significant change in the volume of nighttime vehicle traffic on Project area roads as a result of the Proposed Project.

However, with implementation of the Visual Quality Management Plan component of the Proposed Project, new sources of light or glare resulting from the Proposed Project will comply with USFS VQOs (USFS 2010b). Refer to Chapter 2, Proposed Project for specific required measures addressing Proposed Project operations and maintenance, reconstruction of existing facilities, and construction of new facilities. Additional analysis of the requirements for the Visual Quality Management Plan can be found in FERC's final EIS (FERC 2011), Section 3.3.7, *Land Use and Aesthetic Resources*, pages 338 through 339. Any new sources of light or glare created by the Proposed Project will not be substantial, and so the impact of the proposed project will not be significant.

Mitigation Measures: None required.

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3.2.2 Agricultural and Forest Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation (DOC) as an optional model to use in assessing impacts on agriculture and farmland.

In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection (Cal Fire) regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB).

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined in Public Resources Code section 4526) or timberland zoned Timberland Production (as defined by Government Code section 51104(g)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Over 75 percent of the terrestrial Proposed Project area is occupied by Douglas-fir–Ponderosa pine, Douglas-fir, and mixed conifer forests. Timber production occurs on both public and private lands within the Proposed Project area. A majority of the privately-owned lands are designated in the Shasta County General Plan (2004) as “Timberland” (FERC 2011). However, none of the PG&E lands within the Project area are zoned or used for timber production. Although the USFS conducts timber management activities on its lands, much of the STNF lands in the Project vicinity, particularly near Iron Canyon, are classified as Landscape Scale Restoration, which is a science-based ecosystem restoration of priority forest landscapes (Title IV of the Omnibus Public Land Management Act of 2009).

The Proposed Project area is not suitable for agricultural use due to steep topography, dense forests, poor soils, and limited access. There are no important farmlands used for cultivation or grazing in the Project vicinity.

Discussion

- a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?**

Impact: No Impact

The Farmland Mapping and Monitoring Program classifies lands in the Project area as Other Land (X) (DOC 2016). None of the land is used for agricultural purposes, nor is it considered important farmland. The Proposed Project would have no impact.

Mitigation Measures: None required.

- b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?**

Impact: No Impact

None of the PG&E lands are zoned or used for agricultural use, nor are they under an existing Williamson Act contract (DOC 2010). Proposed Project activities would not conflict with current Williamson Act contracts. The Proposed Project would have no impact.

Mitigation Measures: None required.

- c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined in Public Resources Code section 4526) or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?**

Impact: Less Than Significant

Some of the private lands in the Project area are zoned for timber production, and some of the federal lands are managed for timber resources by the STNF. None of the PG&E lands are zoned or used for timber production (DOC 2010). Road improvements would improve access and would not affect timber productivity on adjacent lands. The Proposed Project would not conflict with the existing zoning or timber uses by STNF, although special use or other permits may be required for some new facilities to ensure compliance with the zoning code and STNF management goals (see Section 3.2.10, Land Use). The Proposed Project would have less than significant impact.

Mitigation Measures: None required.

d. Result in the loss of forest land or conversion of forest land to non-forest use?

Impact: Less Than Significant.

Development of new recreational facilities and expansion of existing recreational facilities would result in the removal of vegetation, including trees, but the effect on timberlands would be minimal. The total area of disturbance across the Project area is expected to be less than 50 acres, which is a small percentage of the total timberlands in the region. In addition, much of the affected land is previously disturbed or is determined unsuitable for timber production (USFS 2008).

None of the other Proposed Project activities would result in the loss of forest land, although some vegetation trimming would be necessary near power lines and other facilities for maintenance. The loss of forest land from recreational developments would be minimal and considered a less than significant impact.

The loss of forest land from recreational developments would be less than 50 acres. No forest land would be converted to non-forest use. Therefore, the impact would be less than significant.

Mitigation Measures: None required.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Impact: No Impact

Proposed Project activities would be limited to the specified work area where new facilities would be located or around existing facilities, and no indirect land conversions are anticipated as a result of the Proposed Project. The Proposed Project would have no impact.

Mitigation Measures: None required.

3.2.3 Air Quality

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to make the following determinations:

Are significance criteria established by the applicable air district available to rely on for significance determinations? Yes No

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The Project is located in the northcentral portion of Shasta County within the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB is bound on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. The height of these mountain ranges, which can climb to 6,000 feet above mean seal level (feet msl) with individual peaks reaching higher, act as a wall to pollutants emitted locally and from pollution that has been transported from the broader Sacramento area by prevailing winds. Thus, the NSVAB landscape is shaped like a bowl holding pollutants that can be further exacerbated by temperature inversion layers acting as a lid, creating unhealthy levels of air pollution.

The air quality in Shasta County is managed by the Shasta County Air Quality Management District (AQMD). The Shasta County AQMD along with other air districts in the northern portion of Sacramento Valley have combined to establish the Northern Sacramento Valley Planning Area (NSVPA). Under the Clean Air Act, the NSVPA districts are required to develop a plan to describe how they will attain and maintain ambient air quality standards (AAQS) for those criteria pollutants that are currently designated nonattainment. As shown in Table 3-1, Shasta County is State designated “nonattainment” for ozone and is “unclassified and/or in attainment” for all other criteria pollutants for both the California AAQS (CAAQS) and National AAQS (NAAQS).

Table 3-1 Shasta County Federal and State Air Quality Attainment Designations

Criteria Pollutants	Federal Attainment Designation	State Attainment Designation
Ozone (O ₃)	Unclassified/Attainment	Nonattainment
Coarse Particulate Matter (PM ₁₀)	Unclassified	Attainment
Fine Particulate Matter (PM _{2.5})	Unclassified/Attainment	Attainment
Nitrogen Dioxide (NO ₂)	Unclassified/Attainment	Attainment
Carbon Monoxide (CO)	Unclassified/Attainment	Unclassified
Sulfur Dioxide (SO ₂)	Unclassified/Attainment	Attainment
Sulfates	---	Attainment
Lead	Unclassified/Attainment	Attainment
Hydrogen Sulfide	---	Unclassified
Visibility Reducing Particles	---	Unclassified

Source: CARB 2018

The NSVPA developed the Air Quality Attainment Plan (AQAP), originally prepared in 1991 and updated triennially with the latest approved AQAP completed in 2015 (Sacramento Valley Air Quality Engineering and Enforcement Professionals [SVAQEPP] 2015). The AQAP focuses on the adoption and implementation of measures that curtail emissions of reactive organic gases (ROG) and oxides of nitrogen (NOx), which are precursors that chemically react in the atmosphere to form O₃. The emissions inventory conducted in the NVSPA in 2015, shows that a majority of the NOx emissions are from mobile sources, including cars, trucks and trains, and stationary sources, including internal combustion engines and boilers with the majority of ROGs emitted from area wide sources, including architectural coatings and solvents. Therefore, the primary focus of the AQAP is to curtail emissions from these source types. The AQAP also includes an outreach program designed to inform and educate the public regarding sources and effects of air pollution.

To help determine whether counties are on track to meeting or maintaining the AAQs, monitoring stations are established throughout California. Shasta County has four air quality monitoring stations. Of the four, the monitoring station closest to the Project site monitors O₃, for which Shasta County is in nonattainment. However, this station is located on Lake Blvd and is situated in an urban cluster which is different than the Project site that is situated in a more rural and natural setting. Thus, the local air quality at this station is not truly indicative of the air quality at the Project site, but it is the best available data for this Project.

Air quality statistics from 2013 through 2017 for the Shasta Lake – Lake Blvd monitoring station are provided in Table 3-2 below. The table shows the maximum O₃ air quality concentrations for the State 1-hour and 8-hour standards and the number of days that the standards were exceeded during that given year.

Table 3-2 Shasta Lake – Lake Blvd O₃ Exceedances for (Years 2013-2017)

Year	1-Hour Observations		8-Hour Averages	
	State Maximum	# Days > State Standard ^a	State Maximum	# Days > State Standard ^a
2013	0.078	0	0.072	1
2014	0.067	0	0.062	0
2015	0.091	0	0.083	14
2016	0.093	0	0.082	14
2017	0.096	1	0.089	13

Source: CARB 2019

^a The CAAQS for O₃ 1-hour concentrations is 0.09 parts per million (ppm) and the 8-hour concentrations is 0.070 ppm. The CAAQSs are exceeded when the rounded average is greater than the standard.

As shown in the above table, the area has predominantly maintained the State's O₃ 1-hour standard; however, starting in 2015 there was a jump in the number of days exceeding the State's O₃ 8-hour standard. Sources of O₃ in the NSVPA include stationary sources, mobile sources, including cars, trucks, and trains, or area sources such as consumer products or wildfires. The broader Sacramento area is also a contributor of O₃ precursor pollutants to the NSVPA as a result of prevailing winds that transport the pollutants to this area (SVAQEEP 2015).

The CEQA thresholds of significance are located in Table AQ-4 in the Air Quality Element of the Shasta County General Plan. Shasta County developed the Air Quality Element section in coordination with the Shasta County AQMD. The thresholds established in this section of the General Plan pertain to the development of land uses that generate long-term sources of emissions, particularly from mobile sources. In general, land use development projects that potentially emit 137 pounds per day of NO_x, ROG, or PM₁₀ would be considered to have significant impacts to air quality.

The General Conformity Rule (Clean Air Act section 176(c)(4); 40 CFR Parts 51 and 93]) requires that the actions taken by federal agencies in nonattainment and maintenance areas do

not interfere with plans to meet NAAQS. Under the General Conformity Rule, federal agencies must work with state, tribal, and local governments in NAAQS nonattainment or maintenance areas to ensure that federal actions conform to implementation plans. Since the FERC relicensing action is in a NAAQS attainment area, the General Conformity Rule does not apply to the Proposed Project.

Discussion

a. Conflict with or obstruct implementation of the applicable air quality plan?

Impact: Less Than Significant

As mentioned above, the applicable air quality plan for this area is the NSVPA's 2015 AQAP, which focuses on reducing O₃ precursors ROG and NO_x from stationary, mobile, and area sources. The Proposed Project would not create a permanent stationary source of air contaminants, include a land use that would generate a substantial number of trips from mobile sources, or involve the use of architectural coatings or solvents during recreational improvements. As a result of the above and due to the relatively small scale of construction activities, including number and pieces of equipment and schedule, the Proposed Project would not conflict with or obstruct implementation of the 2015 AQAP. The Proposed Project would have a less than significant impact.

Mitigation Measures: None required.

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Impact: Less Than Significant

As mentioned above, the Shasta County AQMD and the County developed Thresholds of Significance that focus on quantifying and reducing emissions from long-term, operational emissions, specifically mobile sources. For the purposes of this element, net increases of criteria pollutants would be deemed cumulatively considerable if they would exceed the Thresholds developed by the County.

Operation and maintenance of the additional recreational facility improvements would require up to five additional caretakers. Criteria pollutant emissions, specifically emissions of NO_x, ROG, and PM₁₀ from caretaker vehicle trips, would be negligible compared to existing conditions and would not result in operational impacts that would significantly increase emissions to a level of significance.

Short-term Proposed Project construction activities are not considered to be a significant source of criteria pollutants on an individual basis. CEQA Guidelines section 15064(h)(3) stipulates that for an impact involving a resource that is addressed by an approved plan or mitigation program (e.g., general maintenance-related construction activities for infrastructure), the lead agency may determine that a project's incremental contribution is not cumulatively considerable if the project complies with the adopted plan or program. Furthermore, if the

project would not exceed the CEQA Thresholds of Significance then it would also not result in a cumulatively considerable net increase of criteria pollutants. The AQAP is the most appropriate document to use in addressing cumulative effects for air quality because it sets forth a comprehensive program that will lead the NSVPA, which includes the Proposed Project area, into compliance with state air quality standards for O₃. The AQAP uses control measures and related emission reduction estimates based on emissions projections for a future development scenario derived from land use, population, and employment characteristics defined in consultation with local governments. Because the Proposed Project has no significant long-term impacts that would exceed the Thresholds of Significance or that would create emissions from sources covered by the AQAP, it is not significant on an individual basis during construction activities. Therefore, the Proposed Project's incremental contribution to criteria pollutant emissions is not cumulatively considerable. The Proposed Project would have a less than significant impact.

Mitigation Measures: None required.

c. Expose sensitive receptors to substantial pollutant concentrations?

Impact: No Impact

Certain population groups are considered more sensitive to air pollution and odors than others; in particular, children, elderly, and acutely ill and chronically ill persons, especially those with cardiorespiratory diseases such as asthma and bronchitis. Sensitive receptors (land uses) indicate locations where such individuals are typically found, namely schools, daycare centers, hospitals, convalescent homes, residences of sensitive persons, and parks with active recreational uses, such as youth sports. Due to the remote locations of the work sites and forest recreation land uses of the Proposed Project, there are no characteristic sensitive receptors which would be affected by construction activities. Furthermore, since all construction activities would be short-term (days) compared to long-term exposure criteria (years), no significant exposures to diesel engine exhaust or fugitive dust would occur. The Proposed Project would not result in any impacts related to exposure of sensitive receptors to substantial pollutant concentrations.

Mitigation Measures: None required.

d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Impact: No Impact

The Proposed Project does not include any land uses (e.g., livestock operations, refineries, wastewater treatment plants, landfills) that would generate any substantial amounts of long-term, odorous emissions. Short-term construction activities will generate odors during diesel equipment operation. However, given the remoteness of the Proposed Project location, the short construction duration and minimal pieces of equipment used combined with existing diesel fuel standards that limits the amount of sulfur in fuel to 15 ppm, no

significant amount of odors are anticipated from construction activities that would adversely affect any local residents or a substantial number of temporary visitors to the Project area. The Proposed Project would have no impact.

Mitigation Measures: None required.

3.2.4 Biological Resources

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on 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 Wildlife or the US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or the US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d. 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The Proposed Project is located along the western slope of the Cascade Range in the Central Valley of northern California, within Shasta County, Siskiyou County, and the STNF. The Proposed Project area originates at McCloud Reservoir and occupies the McCloud and Lower Pit River Basins to Shasta Lake. The area surrounding the Proposed Project is primarily federal forest land with rural communities and one larger incorporated city, Redding (>90,000 residents), nearby. Rivers and streams of the area are typically steep gradient and highly confined, resulting in minimal flood plain development. The Proposed Project area is characterized by a variety of vegetation types typical of mixed woodland and mid-elevation forest habitats found in the southeastern Klamath Mountains and west-slope southern Cascade regions. More than three-quarters of the land is occupied by Douglas-fir-Ponderosa pine, Douglas-fir, and mixed conifer forests. The remaining land supports a wide array of vegetation

types where plant species diversity is high due to the complex topography of the area. In general, the topographical features preclude extensive wetland habitat, although wetland-associated vegetation often exists adjacent to and within the active river channel, and additional wetlands occur in small patches along the reservoirs.

Additional descriptions of aquatic resources, terrestrial resources, and threatened and endangered species in the Project area are provided in FERC's final EIS (FERC 2011), Section 3.3.2—*Aquatic Resources*, Section 3.3.3—*Terrestrial Resources*, and Section 3.3.4—*Threatened and Endangered Species*.

Aquatic Resources

Aquatic Habitats

Aquatic habitats associated with the Proposed Project include major storage reservoirs (McCloud Reservoir and Iron Canyon Reservoir), two regulating reservoirs (Pit 6 and Pit 7 Reservoirs), and one afterbay (Pit 7 Afterbay). Proposed Project-affected stream reaches include the Lower McCloud River and Iron Canyon Creek. Each of these is briefly described below.

- > McCloud Reservoir. At maximum storage pool, McCloud Reservoir has 520 surface acres and 14 miles of shoreline. Much of the shoreline around McCloud Reservoir is very steep and privately owned. Reservoir levels in McCloud Reservoir generally reach maximum elevations in late spring or early summer, followed by a sustained draw down lasting through the summer and fall. The water temperatures and water quality conditions in the reservoir support a coldwater trout fishery.
- > Iron Canyon Reservoir. At maximum storage pool, Iron Canyon Reservoir has 506 surface acres and 11 miles of shoreline. Five primary tributaries drain into Iron Canyon Reservoir and provide spawning and rearing habitat for trout. Water levels in Iron Canyon Reservoir generally reach maximum elevations in late spring or summer, followed by a sustained draw down lasting through the summer and fall. The water temperatures and water quality conditions in the reservoir include a well-developed thermocline, and a deep thermally stable hypolimnion, which supports a coldwater trout fishery.
- > Pit 6 Reservoir. Pit 6 Reservoir typically has 265 surface acres and ten miles of shoreline. Pit 6 Reservoir serves as the forebay for Pit 6 Powerhouse and water surface elevation fluctuates daily. Littoral habitat is limited because of the steep topography of the channel and surrounding valley. Water temperature and water quality conditions support a transitional-zone fish assemblage (i.e., native foothill assemblage, or Sacramento pikeminnow/Sacramento sucker/hardhead assemblage) including (in decreasing order of abundance) native tule perch, hardhead, Sacramento pikeminnow, and Sacramento sucker. Pit 6 Reservoir is not stocked and receives relatively low angling pressure compared to McCloud and Iron Canyon Reservoirs because of limited accessibility by steep canyon walls and private property restrictions.

- > Pit 7 Reservoir. Pit 7 Reservoir typically has 468 surface acres and 16 miles of shoreline; it is surrounded by steeply sloping, forested lands. Pit 7 Reservoir serves as the forebay for the Pit 7 Powerhouse and water surface elevation fluctuates daily. The upper reaches of this reservoir provide riverine habitat, which shifts to lacustrine habitat for a majority of the length of the reservoir. Pit 7 Reservoir water temperature and water quality conditions support a transitional-zone fish assemblage including (in decreasing order of abundance) native tule perch, hardhead, Sacramento sucker, and Sacramento pikeminnow. Pit 7 Reservoir is not stocked with trout and receives relatively low angling pressure compared to the McCloud River and McCloud and Iron Canyon Reservoirs, due to limited accessibility.
- > Pit 7 Afterbay. Pit 7 Afterbay Dam creates a run-of-the-river afterbay approximately two miles long with an average surface area of 69 acres. The shoreline is generally steep and rocky, and the surrounding terrain is forested with the exception of a broad, shallow, vegetated littoral zone that occurs along the left bank in the vicinity of Fenders Flat near Pit 7 Afterbay Dam. Aquatic habitat within the upstream half of the afterbay is typically riverine, transitioning to more lacustrine habitat near the afterbay dam. The broad, shallow, habitat near the afterbay dam includes submerged aquatic vegetation that provides refuge for larval and juvenile fishes and foraging habitat for juvenile and adult fishes.
- > Lower McCloud River. The Lower McCloud River extends approximately 24 miles from McCloud Dam downstream to Shasta Lake. At its headwaters, the McCloud River is supplied by cold-water springs that contribute to cool year-round water temperatures throughout the 24-mile-long reach. Project facilities at McCloud Dam regulate stream flow from the upper basin into the mainstem Lower McCloud River below the dam. The Lower McCloud River is fed by several tributaries, which cumulatively diminish the Project influence on flow levels and aquatic resources moving downstream from McCloud Dam. The McCloud River supports a viable trout fishery throughout the entire 24-mile-long reach. The Lower McCloud River also supports a Sacramento sucker/pikeminnow assemblage just above Shasta Lake; these species are typically associated with foothill elevations and transitional zone water temperatures.
- > Iron Canyon Creek. Iron Canyon Creek is a relatively short stream with a total length of 4.6 miles over an elevation range of 1,041 feet (4.3 percent average gradient), from 2,470 feet at Iron Canyon Dam to 1,430 feet at the confluence with Pit 6 Reservoir. Iron Canyon Creek receives water from Iron Canyon Reservoir, which receives water diverted from McCloud Reservoir and from a few small tributary streams. Iron Canyon Creek supports a self-sustaining population of rainbow trout which was found to be in good condition during surveys, a small population of brown trout, and Pit sculpin. Iron Canyon Creek has relatively low angling pressure compared to McCloud River and Project reservoirs due to limited accessibility by the steep canyon and private property restrictions.

Aquatic Species

This section provides a summary of special-status aquatic wildlife known to occur in the Proposed Project area. This section also provides information on species, such as benthic macroinvertebrates (BMI) and fish communities, that are not special-status but provide information on existing conditions in the aquatic environment (i.e., index of aquatic environment health).

Refer to Table 3-3 for a list of special-status aquatic wildlife species considered in this analysis including their status, habitat requirements, and potential for occurrence in the Proposed Project area. Special-status aquatic species are defined to include animals that are proposed, candidate, or listed as threatened or endangered under the California Endangered Species Act (CESA); wildlife considered species of special concern by the California Department of Fish and Wildlife (CDFW); and California fully protected species. In addition, this analysis includes species that are proposed, candidate, or listed as threatened or endangered under the federal Endangered Species Act (ESA).

- > Benthic Macroinvertebrates. PG&E conducted BMI sampling in the Project-affected reaches of the Lower McCloud River and Iron Canyon Creek in August and September 2007 and November 2008. During the 2007 sampling, PG&E also collected reference samples from Squaw Valley Creek (a tributary of the McCloud River) and Clear Creek (a tributary to Iron Canyon Reservoir). In addition, PG&E acquired historical (1999-2008) BMI data from The Nature Conservancy's McCloud River Preserve for comparison purposes. From the 14 benthic samples collected by PG&E in 2007 and 2008, a total of 6,970 organisms comprising 95 distinct taxa were collected. Insects comprised a majority of the benthic community including 13 mayfly taxa, 19 stonefly taxa, 18 caddisfly taxa, and nine beetle taxa. Other invertebrates included oligochaetes, clams, and gastropods. A multi-metric index based on five metrics was formulated for each sample taken within the Project area. Overall, the physical habitat data and BMI samples collected over ten years within the Project area generally indicated good aquatic habitat conditions and water quality.
- > Aquatic Mollusks. An aquatic mollusk survey was conducted in the summer and fall 2007 to inventory mollusk species in the Project vicinity. In total, three species of freshwater mussels, four species of *Sphaeriacean* clams, and nine species of aquatic snails were found during the 2007 survey. No federal or California-listed mollusks were identified.
- > Fish. During fish surveys conducted in the fall of 2007 and 2008, a total of 15 species were observed, including four species (bluegill, brook trout, channel catfish, and spotted bass) that had not been previously documented. Five species (bigeye marbled sculpin, common carp, green sunfish, pit roach, and speckled dace) that were historically observed in Project reservoirs were not observed in the 2007 and 2008 surveys. Refer to Table 3-3 for a summary of fish species found in the Project reservoirs and stream reaches.

The dominant species in Project reservoirs with colder water (McCloud and Iron Canyon) and Project stream reaches with colder water (Lower McCloud River and Iron Canyon

Creek) were rainbow trout and brown trout, with rainbow trout being dominant. In the warmer transition-zone habitat (Pit 6 and Pit 7 reservoirs and Pit 7 Afterbay) the dominant species included tule perch and hardhead.

Only one of the 15 species observed, hardhead (*Mylopharodon conocephalus*), is a special-status species (California species of special concern). Hardhead were found in Pit 6 and Pit 7 Reservoirs and Pit 7 Afterbay. Hardhead are a large, native minnow generally found in undisturbed areas of larger low- to middle-elevation streams (elevation between 30 and 4,760 feet in the Sacramento and San Joaquin watersheds). Its range extends from the Kern River in the south to the Pit River in the north. Hardhead inhabit areas that have clear, deep pools with sandy, gravel/boulder substrates and slow water velocities (less than 0.05 foot per second). Hardhead co-occur with Sacramento pikeminnow and usually with Sacramento suckers, and tend to be absent from streams where introduced species, especially centrarchids, predominate (Moyle 2002).

Prior to the completion of Shasta Dam in 1942, Chinook salmon and other anadromous fishes were able to travel up the McCloud River as far as the 20-foot-high Lower Falls. Since the completion of Shasta Dam, Chinook salmon have been extirpated from the McCloud and Pit Rivers. Extirpation of Chinook populations had impacts to other species in the ecosystem, notably bull trout (originally identified as Dolly Varden) that predate on early life stages of Chinook. Bull trout are no longer present in the McCloud and Pit River watersheds. In 1950, Keswick Dam was completed downstream of Shasta Dam, further blocking anadromous fish passage into the Project area.

The Reasonable and Prudent Alternative from the Biological and Conference Opinion on the Long-Term Operation of the Central Valley Project and State Water Project (National Marine Fisheries Service 2009) includes a Fish Passage Program (Action V) to evaluate the reintroduction of federally listed anadromous fish above three reservoirs operated by the United States Bureau of Reclamation (Shasta, Folsom, and New Melones Reservoirs). If implemented above Shasta Dam, the Fish Passage Program could result in the future presence of listed anadromous fish in the waters below Project dams. However, since listed anadromous fish are not currently present in the waters of the McCloud-Pit Project, this analysis does not include impacts of the Proposed Project on listed salmonids.

Aquatic Amphibians

- > Pacific Tailed Frog. Pacific tailed frogs (*Ascaphus truei*) are a California species of special concern. The Pacific tailed frog uses cold, rocky streams in humid forests of Douglas-fir, pine, spruce, hemlock, redwood, maple, and alder, with interspersed grassland or chaparral. Tailed frog tadpoles and adults were observed in Ladybug Creek, a tributary to the Lower McCloud River, during two separate visits in the summer of 2007.
- > Foothill Yellow-Legged Frog. The foothill yellow-legged frog (*Rana boylei*) (FYLF) is a candidate for CESA listing as threatened, and a California species of special concern. This frog inhabits small streams below 5,000 feet msl where breeding occurs in low- to moderate- gradient streams in shallow edge-water areas, often close to confluences with tributary streams. FYLF were observed at seven sites located between river mile

(RM)¹² 1.4 and RM 5.7 on the Lower McCloud River and associated tributaries. Evidence of breeding (egg masses or tadpoles) was observed at four mainstem sites. Post-metamorphic frogs (adults, juveniles, or young-of-year) were observed at four mainstem sites and three tributaries.

In 2008, a total of twelve egg masses were observed in the Lower McCloud River between May 8 and June 10. One egg mass was observed at Site 119, six egg masses were observed at Site 120, four egg masses were observed at Site 122, and one egg mass was observed at Site 140. All egg masses were recorded at depths and velocities consistent with FYLF breeding in other California watersheds.

Aquatic Reptiles

- > Western Pond Turtle. The western pond turtle (*Actinemys marmorata*) is a California species of special concern. This species inhabits ponds, lakes, rivers, marshes, streams, and irrigation ditches with rocky or muddy bottoms and herbaceous vegetation. Western pond turtles were found in Pit 6 and Pit 7 Reservoirs during 2007, as well as along the Lower McCloud River in 2007 and 2008. At Pit 6 Reservoir, western pond turtles were observed in the downstream half of the west side of the reservoir. At Pit 7 Reservoir, western pond turtles were observed in the downstream third of the north (river right) side of the reservoir. On the Lower McCloud River, adult and juvenile western pond turtles, as well as one western pond turtle egg, were incidentally observed at four sites between RM 1.4 and 3.0 during FYLF surveys in 2007 and 2008.

¹² RM is a measure of distance in miles along a river from its mouth, which begins at RM 0.

Table 3-3 Fish Species Identified in Project Reservoirs and Stream Reaches During Relicensing Technical Studies

Species	Native / Introduced	Federal ESA and CESA Status		Project Reservoirs/Afterbays					Project Stream Reaches	
		CDFW	USFWS ^a	McCloud Reservoir	Iron Canyon Reservoir	Pit 6 Reservoir	Pit 7 Reservoir	Pit 7 Afterbay	Lower McCloud River	Iron Canyon Creek
Bluegill (<i>Lepomis macrochirus</i>)	I	—	—				X			
Brook trout (<i>Salvelinus fontinalis</i>)	I	—	—	X						
Brown trout (<i>Salmo trutta</i>)	I	—	—	X	X				X	X
Channel catfish (<i>Ictalurus punctatus</i>)	I	—	—			X				
Hardhead (<i>Mylopharodon conocephalus</i>)	N	CSC	—			X	X	X		
Largemouth bass (<i>Micropterus salmoides</i>)	I	—	—				X			
Pit sculpin (<i>Cottus pitensis</i>)	N	—	—					X		X

Table 3-3 Fish Species Identified in Project Reservoirs and Stream Reaches During Relicensing Technical Studies

Species	Native / Introduced	Federal ESA and CESA Status		Project Reservoirs/Afterbays					Project Stream Reaches	
		CDFW	USFWS ^a	McCloud Reservoir	Iron Canyon Reservoir	Pit 6 Reservoir	Pit 7 Reservoir	Pit 7 Afterbay	Lower McCloud River	Iron Canyon Creek
Rainbow trout (<i>Oncorhynchus mykiss</i>)	N	—	—	x	x		x	x	x	x
Riffle sculpin (<i>Cottus shasta</i>)	N	—	—			x			x	
Sacramento pikeminnow (<i>Ptychocheilus grandis</i>)	N	—	—			x	x		x	
Sacramento sucker (<i>Catostomus occidentalis</i>)	N	—	—			x	x	x	x	
Smallmouth bass (<i>Micropterus dolomieu</i>)	I	—	—				x	x		
Spotted bass (<i>Micropterus punctulatus</i>)	I	—	—					x		

Table 3-3 Fish Species Identified in Project Reservoirs and Stream Reaches During Relicensing Technical Studies

Species	Native / Introduced	Federal ESA and CESA Status		Project Reservoirs/Afterbays					Project Stream Reaches	
		CDFW	USFWS ^a	McCloud Reservoir	Iron Canyon Reservoir	Pit 6 Reservoir	Pit 7 Reservoir	Pit 7 Afterbay	Lower McCloud River	Iron Canyon Creek
Tui chub (<i>Gila bicolor</i>)	N	—	—				X			
Tule perch (<i>Hysterocarpus traski</i>)	N	—	—			X	X			

Notes:

^a United States Fish and Wildlife Service

Terrestrial Resources

Terrestrial Habitats

Provided below is a brief summary of terrestrial habitats in the Proposed Project area.

- > Vegetation Communities. Forty-seven vegetation series or types were mapped in the Project area. The Project area is dominated by Douglas fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), and other mixed conifer vegetation types (approximately 75 percent of the mapped area); and also includes a variety of other vegetation types typical of mid-elevation forests and valleys found in the southeastern Klamath Mountains and southern Cascade regions. Eighteen of the 47 vegetation series or types identified are indicative of wetland or riparian habitats. Wetland and riparian habitats are dependent on particular hydrologic regimes and are, therefore, considered particularly sensitive to potential Project effects. The results of riparian vegetation studies conducted as a component of the relicensing are provided below.
- > Riparian Vegetation. A riparian vegetation study was conducted to assess potential Project effects in the riparian zone of the Lower McCloud River. The riparian zone of the Lower McCloud River, as defined by the presence of riparian vegetation, is generally less than 75 feet wide because of the confined channel and steep nature of the surrounding valley walls. Vegetation within the riparian zone is dominated by white alder (*Alnus rhombifolia*), blackfruit dogwood (*Cornus sessilis*), big-leaf and vine maple (*Acer macrophyllum* and *A. circinatum*), blackberry (*Rubus* spp.), poison oak (*Toxicodendron diversilobum*), and a variety of herbaceous species, including naked sedge (*Carex nudata*) and Indian rhubarb (*Darmera peltata*). Douglas-fir and mixed conifer stands occur along the uplands and toe-slopes adjacent to riparian vegetation.

Terrestrial Species

This section provides a summary of terrestrial special-status plants and wildlife known to occur in the Proposed Project area.

Refer to Table 3-4 for a list of special-status plants considered in this analysis including their status, habitat requirements, blooming period information, and potential for occurrence in the Project area. Special-status plants include those listed as rare, endangered, or threatened under CESA or assigned a California Rare Plant Ranking (CRPR) of 1, 2, or 3 by the California Native Plant Society (2018). In addition, this analysis includes plant species that are listed as threatened or endangered under the federal ESA.

Refer to Table 3-5 for a list of special-status terrestrial wildlife species considered in this analysis, including their status, habitat requirements, and potential for occurrence in the Project area. Special-status terrestrial wildlife are defined as animals that are proposed, candidate, or listed as threatened or endangered under CESA; wildlife considered species of special concern by CDFW; and California fully protected species. In addition, this analysis includes wildlife species that are proposed, candidate, or listed as threatened or endangered under the federal ESA.

Special-Status Plants

There are no federal- or State-listed special-status plants in the Proposed Project area, and no special-status lichens or fungi were documented in the Proposed Project area. The following special-status plant species listed below with a CRPR of 1, 2, or 3 have been identified in the Project area. Refer to Table 3-4 for location and number of occurrences.

- > Shasta eupatorium (*Ageratina shastensis*); CRPR 1B.2. (Nevares and Jurjavec 2009; California Natural Diversity Database [CNDDDB] 2018)
- > Rattlesnake fern (*Botrypus virginianus*); CRPR 2B.2 (CNDDDB 2018)
- > Northern clarkia (*Clarkia borealis* ssp. *borealis*); CRPR 1B.3 (Nevares and Jurjavec 2009; CNDDDB 2018)
- > Shasta limestone monkeyflower (*Erythranthe taylorii*); CRPR 1B.1 (CNDDDB 2018)
- > Butte County fritillary (*Fritillaria eastwoodiae*); CRPR 3.2 (Nevares and Jurjavec 2009; CNDDDB 2018)
- > Howell's lewisia (*Lewisia cotyledon* var. *howellii*); CRPR 3.2 (Nevares and Jurjavec 2009)
- > Canyon Creek stonecrop (*Sedum obtusatum* ssp. *paradisum*); CRPR 1B.3 (CNDDDB 2018)

Terrestrial Invertebrates

- > Valley Elderberry Longhorn Beetle. Fifteen elderberry populations were identified during botanical surveys conducted as a component of the relicensing. However, in September 2015, the USFWS withdrew the proposed rule to remove valley elderberry longhorn beetle (VELB) from the federal list of Endangered and Threatened Wildlife and concurrently re-evaluated and revised the range of the species. Based on the revised range, the Proposed Project is no longer in the range for VELB.

Terrestrial Amphibians

- > Shasta Salamander. Shasta salamanders (*Hydromantes shastae*) are listed as threatened under CESA. Shasta salamanders were found during relicensing surveys at two sites, McCloud Reservoir and Fenders Flat/Pit 7 Afterbay Dam. This species primarily inhabits limestone outcrops and caves and adjacent slope habitats in mixed forests of Douglas-fir, foothill pine, and black and canyon oak. Elevations range from 1,000 to 3,000 feet msl, and it may also use a variety of non-limestone habitats within its known range. Near McCloud Reservoir, adult and juvenile Shasta salamanders were found in both limestone and non-limestone habitats. Near Fenders Flat/Pit 7 Afterbay Dam, adult Shasta salamanders were found in non-limestone habitat generally located west of Pit 7 Afterbay Dam on the north side of the Pit River channel. The species likely occurs in other available limestone and non-limestone habitats throughout the Project area.

Avian Species

- > Northern Goshawk. The northern goshawk (*Accipiter gentilis*), a large forest-dwelling raptor that uses a wide variety of habitat types for foraging, nesting, and dispersal, is a California species of special concern. Six northern goshawk individuals were detected. Four of the northern goshawk detections were associated with a suspected northern goshawk activity center located on USFS land approximately 0.5 mile south of Ah-Di-Na Campground. The remaining two detections occurred at the southeast end of the Pit 6 Transmission Line approximately 1.5 miles northwest of Wengler. No additional detections occurred during follow-up surveys for these detections, nor were any nests found.
- > Willow Flycatcher. The willow flycatcher (*Empidonax traillii*) is a small migratory passerine bird that nests in riparian willow thickets. This species is listed as endangered under CESA. Willow flycatchers were detected at the Iron Canyon Reservoir and Fenders Flat/Pit 7 Afterbay Dam survey areas, but nesting was not observed in the Project area during relicensing surveys. Based on this, willow flycatchers are considered “present” at Iron Canyon Reservoir in the Cedar Salt Log Creek and McGill Creek inlets, and at Fenders Flat/Pit 7 Afterbay Dam survey areas, but not “territorial” for the purposes of determining occupancy (i.e., breeding).
- > Peregrine Falcon. The peregrine falcon (*Falco peregrinus anatum*) was officially removed from listing under the federal ESA and CESA in 1999, but still retains special-status as a California fully protected species. Nesting peregrine falcon pairs were found along almost all major Project water bodies. Within the Project area, peregrine falcons nesting pairs were documented in large rock outcroppings along the McCloud River, Iron Canyon Creek, Pit 7 Reservoir, and Pit 6 Reservoir. Although the location of the STNF historical eyrie (i.e., nest) at Pit 6 could not be verified, it is likely to be the same territory now occupied by the Pit 6-15 pair documented during 2007–2008 surveys. The 2007–2008 surveys also documented breeding at four territories, three of which are presumed to be previously undocumented. Each nesting pair produced at least one young and in most cases two young were observed per active nest.
- > Bald Eagle. The bald eagle (*Haliaeetus leucocephalus*) was federally delisted (as of August 2007), but still retains special-status under the Eagle Act, as a California State endangered species, and a California fully protected species (CA Fish & G. Code § 3511). There are eight bald eagle nesting territories in the Project area, including two previously unknown territories discovered during relicensing studies at Chatterdown Creek and McCloud Bridge, and a third territory at Pit 6 Reservoir. Bald eagle prey studies in the 1980s at McCloud and Iron Canyon Reservoirs revealed a diverse diet of salmonids, water and land birds, and mammals including deer and squirrels. It is suspected that salmonids make up a large portion of the diet of these eagles.
- > Northern Spotted Owl. The northern spotted owl (*Strix occidentalis caurina*), a medium-sized nocturnal raptor that inhabits mature forest habitats, is listed as threatened under the federal ESA and CESA and is a California species of special concern. Critical habitat has been designated for the species, and a revised recovery

plan was released (USFWS 2011). There is no designated critical habitat for this species in the Project area. No northern spotted owls or active nests were detected in the Project area. One single female northern spotted owl of unknown reproductive status was detected just outside of the Project area in the upper Mink Creek drainage, east of Van Sicklin Butte.

Bats

The Project area includes aquatic habitats (e.g., reservoirs, rivers), mixed conifer forests, open habitat, and structures to support hydroelectric operations. Such habitats provide features that support roosting, foraging, and migration for various bat species. Habitat for day, night, and maternity roosts is available in the Project area and includes human-made structures, trees (particularly snags and live or dead oaks), and rock features (e.g., cliffs, large rock outcrops, and caves). Foraging habitat is present in forests, along forest edges, in meadows, and over water bodies including reservoirs, rivers, and streams. Streams, rivers, and transmission line corridors may also provide migration corridors for populations that migrate through the Central Valley.

Surveys to assess habitat and the presence of bat species in the current Project area were conducted in 2007 and 2008. Sixteen bat species, including five special-status, are known to occur in the Project area:

- > Pallid bat (*Antrozous pallidus*) is a California species of special concern. Individuals were detected acoustically during relicensing studies at McCloud and Iron Canyon Reservoirs and associated structures; and detected acoustically and captured at Pit 6 and Pit 7 Reservoirs and associated structures.
- > Townsend's big-eared bat (*Corynorhinus townsendii*) is a California species of special concern. This species was detected acoustically during relicensing studies at the Pit 6 Reservoir shoreline and both detected acoustically and captured along the limestone caves at McCloud Reservoir.
- > Spotted bat (*Euderma maculatum*) is a California species of special concern. Individuals have been previously documented adjacent to an inactive sewage lagoon near the town of McCloud.
- > Western mastiff bat (*Eumops perotis*) is a California species of special concern. Individuals were detected acoustically during relicensing studies at the Pit 6 Dam, the first record of this species for the Pit River.
- > Western red bat (*Lasiurus blossevillii*) is a California species of special concern. Individuals were detected acoustically during relicensing studies at McCloud, Iron Canyon, Pit 6, and Pit 7 Reservoirs and associated structures.

Special Status Mammals

Special-status mammals such as Sierra Nevada red fox (*Vulpes vulpes necator*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), ringtail (*Bassariscus astutus*), and Oregon snowshoe hare (*Lepus americanus klamathensis*) may potentially occur in suitable forest and riparian habitats in the Project area. In addition, one special-status forest carnivore, the fisher (*Pekania pennant*), is known to occur in the Proposed Project area. Information on this species is summarized below.

Fisher – West Coast Distinct Population Segment (DPS). The fisher (*Pekania pennant*) is a candidate species for federal listing, as well as a California species of special concern. This medium-sized forest carnivore is strongly associated with mature and late successional forest habitats. The Proposed Project area is located within the current known range for fisher, and mapping efforts identified 16,297 acres of potentially suitable habitat for this species. One incidental fisher sighting occurred in the Proposed Project area in 2007 at Forest Road 11 on the northeast side of Iron Canyon Reservoir.

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Table 3-4 Special-Status Plant Species Known to Occur or Potentially Occurring in the Project Area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
Known to occur						
<i>Ageratina shastensis</i>	Shasta ageratina, Shasta eupatorium	–	1B.2	June–Oct	Found in chaparral, lower montane coniferous forest; rocky. Elevation: 1,312-5,904 feet	<p>Known to occur within 0.5 mile of the Project area.</p> <ul style="list-style-type: none"> This species was observed during relicensing surveys completed in 2009 (Nevares and Jurjavic 2009). One small patch of approximately five plants is present on a bank of exposed bedrock at a dispersed recreation site adjacent to the Lower McCloud River. CNDDDB reports one occurrence, dated 2013, along McCloud Reservoir Road (Forest Road 11). 20-30 individuals are growing in rock crevices high above the road (CNDDDB 2018). <p>CNDDDB: There are 22 documented occurrences of this species within the 22 quadrangles encompassing the Project area. One of these occurrences, described above, is located within 0.5 mile of the Project.</p>
<i>Botrypus virginianus</i>	rattlesnake fern	–	2B.2	June–Sep	Found in bogs and fens, lower montane coniferous forest (mesic), meadows and seeps, riparian forest, and streams. Elevation: 2,345-4,444 feet	<p>Known to occur within 0.5 mile of the Project area.</p> <ul style="list-style-type: none"> This species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDDB reports one occurrence with 24 individuals, dated 2011, located on private timberland approximately 0.25 mile south of the Pit 7 230-kV Transmission Line (CNDDDB 2018). <p>CNDDDB: There are 17 documented occurrences of this species within the 22 quadrangles encompassing the Project area. One of these occurrences, described above, is located within 0.5 mile of the Project.</p>
<i>Clarkia borealis</i> ssp. <i>borealis</i>	northern clarkia	FSS	1B.3	June–Sep	Found in chaparral, cismontane woodland, lower montane coniferous forest; often in roadcuts. Elevation: 1,312-5,133 feet	<p>Known to occur within 0.5 mile of the Project area.</p> <ul style="list-style-type: none"> This species was observed during relicensing surveys completed in 2009 (Nevares and Jurjavic 2009). A total of 20 populations were found in the Project area: 16 populations along Oak Mountain Road, two along Pit 6 Road and two along the Pit 6 transmission line. CNDDDB reports additional occurrences along Oak Mountain Road South, recorded in 2010 and 2012 (CNDDDB 2018). <p>CNDDDB: There are 59 documented occurrences of this species within the 22 quadrangles that encompass the Project area. One of these occurrences, described above, is located within 0.5 mile of the Project.</p>

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Erythranthe taylorii</i>	Shasta limestone monkeyflower	–	1B.1	Apr–May	Found in openings, carbonate crevices, and rocky outcrops in cismontane woodlands and lower montane coniferous forests. Elevation: 1,164-3,214 feet	<p>Known to occur within 0.5 mile of the Project area.</p> <ul style="list-style-type: none"> This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB reports an unknown number of plants growing in a rocky slope along Forest Road 11 and Hawkins Creek. The record is dated 2011. <p>CNDDDB: There are 19 documented occurrences of this species within the 22 quadrangles that encompass the Project area. One of these occurrences, described above, is located within 0.5 mile of the Project.</p>
<i>Fritillaria eastwoodiae</i>	Butte County fritillary	FSS	3.2	March–June	Endemic to the foothills of the northern Sierra Nevada and Cascade Mountains in California. It grows in dry open woodlands and chaparral. Can be found on serpentine soils. Elevation: 165-4920 ft	<p>Known to occur within 0.5 mile of the Project area.</p> <ul style="list-style-type: none"> This species was observed within the Project area during surveys conducted for relicensing in 2009 (Nevares and Jurjavcic 2009). Six populations were documented near the Pit 7 Afterbay. CNDDDB reports an additional population of approximately 105 plants on private timberlands, approximately 0.3 mile southwest of the Pit 7 230-kV Transmission Line. <p>CNDDDB: There are 40 documented occurrences of this species within the 22 quadrangles encompassing the Project area.</p>
<i>Lewisia cotyledon</i> var. <i>howellii</i>	Howell's lewisia	–	3.2	Apr–July	Found in broad leafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest; rocky. Elevation: 492–6,594 feet	<p>Known to occur within 0.5 mile of the Project area.</p> <ul style="list-style-type: none"> One population was observed at a Lower McCloud River recreation site and a second population was documented at a recreation site between McCloud Dam and Hawkins Tunnel in 2009 (Nevares and Jurjavcic 2009). <p>CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.</p>
<i>Sedum obtusatum</i> ssp. <i>paradisum</i>	Canyon Creek stonecrop	FSS	1B.3	May–June	Found in broad leafed upland forest, chaparral, lower montane coniferous forest, subalpine coniferous forest; granitic, rocky. Elevation: 984-6,232 feet	<p>Known to occur within 0.5 mile of the Project area.</p> <ul style="list-style-type: none"> This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB reports a 2011 occurrence, exact location unknown, along the main stem of Hawkins Creek. <p>CNDDDB: There are six documented occurrences of this species within the 22 quadrangles encompassing the Project area.</p>

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
May Potentially Occur						
<i>Agrostis hendersonii</i>	Henderson's bent grass	-	3.2	April–June	Found in valley foothill grassland and vernal pools. Elevation: 229-1,000 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are three documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Botrychium pumicola</i>	pumice moonwort	FSS	2B.2	July–Sep	Found in alpine boulder, subalpine coniferous forests, rock fields, and volcanic soils.	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Brasenia schreberi</i>	watershield	–	2B.3	June–Sep	Found in marshes and swamps; freshwater. Elevation: 98-7,216 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There is one documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Buxbaumia viridis</i>	buxbaumia moss	FSS	2B.2	N.A.	Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest; fallen, decorticated wood or humus/moss. Elevation: 3,199-7,218 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Calochortus syntrophu</i>	Callahan's mariposa-lily	–	1B.1	May–June	Found in cismontane woodland and valley and foothill grassland (vernally mesic). Elevation: 1,722-3,756 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Cardamine angulata</i>	seaside bittercress	-	2B.1	Mar–July	Wet areas, such as streambanks. Lower montane coniferous forest and north coast coniferous forest. Elevation: 82-3001 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Castilleja elata</i>	Siskiyou paintbrush	–	2B.2	May–Aug	Found in bogs and fens, lower montane coniferous forest (seeps); often serpentinite. Elevation: 0-5,740 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within 22 quadrangles that encompass the Project area.
<i>Chaenactis suffrutescens</i>	Shasta chaenactis	FSS	1B.3	May–Sep	Found in lower montane coniferous forest, upper montane coniferous forest; sandy. Elevation: 2,460-9,184 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Clarkia borealis</i> ssp. <i>arida</i>	Shasta clarkia	–	1B.1	June–Aug	Found in cismontane woodland, lower montane coniferous forest (openings). Elevation: 1,607-1,952 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are two documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Cordylanthus tenuis</i> ssp. <i>pallescens</i>	pallid bird's-beak	FSS	1B.2	July–Sep	Found in lower montane coniferous forest (gravelly, volcanic alluvium). Elevation: 2,280-5400 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Crataegus castlegarensis</i>	Calstlegar hawthorne	–	3	May–June	Found in riparian woodland (moist); rocky loam. Elevation: 0-4,775 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Cudonia monticola</i>	mountain cudonia	FSS	-	–	Spruce needles and conifer debris under conifers and occasionally near snow banks. Elevation: 0-5,000 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Dendrocollybia racemosa</i>	branched collybia	FSS	-	Late fall- mid winter	Old growth stands on decayed or decaying mushrooms or coniferous duff.	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Epilobium oregonum</i>	Oregon fireweed	FSS	1B.2	June–Sep	Found in mesic soil. Bogs and fens, lower montane coniferous forest, meadows and seeps, and upper montane coniferous forest. Elevation: 1,640-7,350 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Eriastrum tracyi</i>	Tracy's eriastrum	FSS	3.2	May–July	Found in chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 1,033-5,840 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Eriogonum ursinum</i> var. <i>erubescens</i>	blushing wild buckwheat	FSS	1B.3	June–Sep	Found in chaparral (montane), lower montane coniferous forest; rocky. Elevation: 2,461–6,234 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Erythranthe taylorii</i>	Shasta limestone monkeyflower	–	1B.1	Apr–May	Found in cismontane woodland, lower montane coniferous forest; openings, carbonate crevices, and rocky outcrops. Elevation: 1,164-3,214 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are 19 documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Erythronium shastense</i>	Shasta fawn lily	–	1B.2	Feb–Apr	Found in cismontane woodland, lower montane coniferous forest; usually carbonate, rocky, north-facing or shaded habitats. Can form clumps due to bulb offsets. Elevation: 1,148-3,346 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are nine documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Eucephalis vialis</i>	wayside aster	FSS	1B.2	June–Sep	Found in gravelly soil. Lower montane coniferous forest and upper montane coniferous forest. Elevation: 2,985-5,070 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Geum aleppicum</i>	Aleppo avens	–	2B.2	June–Aug	Found in great basin scrub, lower montane coniferous forest, meadows, and seeps. Elevation: 1,476-4,920 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Harmonia doris-nilesiae</i>	Niles' harmonia	FSS	1B.1	May–July	Found in chaparral, cismontane woodland, lower montane coniferous forest; usually serpentinite, openings, rocky. Elevation: 2,133–5,446 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Harmonia stebbinsii</i>	Stebbins' harmonia	FSS	1B.2	May–June	Found in chaparral and lower montane coniferous forest; serpentinite soils. Elevation: 1,310-5,180 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Iliamna latibracteata</i>	California globe mallow	FSS	1B.2	June–Aug	Found often in burned areas, chaparral (montane), lower montane coniferous forest, north coast coniferous forest (mesic), and riparian scrub (streambanks). Elevation: 196-6,560 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Ivesia pickeringii</i>	Pickering's ivesia	FSS	1B.2	June–Aug	Lower montane coniferous forest, meadows, and seeps; mesic, clay, usually serpentinite seeps. Elevation: 2,625–4,954 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Lewisia cantelovii</i>	Cantelow's lewisia	FSS	1B.2	May–Oct	Endemic to California, known from the northeastern mountain ranges from the Klamath Mountains to the northern Sierra Nevada. It grows in rocky, moist mountain habitats. Elevation: 1,080-4,490 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Lewisia cotyledon</i> var. <i>heckneri</i>	Heckner's lewisia	–	1B.2	May–July	Found in lower montane coniferous forest (rocky). Elevation: 738-6,888 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Limnanthes floccosa</i> ssp. <i>bellingermana</i>	Bellinger's meadowfoam	–	1B.2	Apr–June	Found in cismontane woodland, meadows, and seeps. Elevation: 951-3,608 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Neviusia cliftonii</i>	Shasta snow-wreath	FSS	1B.2	April–June	Found in cismontane woodland, lower montane coniferous forest, riparian woodland; often streamsides; sometimes in carbonate, volcanic, or metavolcanic soils. Elevation: 984-1,935 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are 15 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Orcuttia tenuis</i>	slender Orcutt grass	FT	1B.1	May–Oct	Found in gravelly vernal pools. Elevation: 115-5,770 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Orthotrichum holzingeri</i>	Holzinger's orthotrichum moss	–	1B.3	–	Found in cismontane woodland, lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest; usually on rock, in and along streams, and rarely on tree limbs. Elevation: 2,345-5,904 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Parnassia cirrata</i> var. <i>intermedia</i>	Cascade grass-of-Parnassus	FSS	2B.2	July–Sep	Found in rocky serpentine soils, bogs, fens, meadows, and seeps. Elevation: 2,560-6,495 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Phacelia greenei</i>	Scott Valley phacelia	FSS	1B.2	April–June	Found in serpentinite soil. Closed-cone coniferous forest, lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 2,625-8,000 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Poa sierrae</i>	Sierra blue grass	–	1B.3	April–July	Found in lower montane coniferous forests on steep, shady, and moist slopes. Elevation: 1,200-3,800 feet.	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Sedum obtusatum</i> ssp. <i>paradisum</i>	Canyon Creek stonecrop	FSS	1B.3	May–June	Found in broad leafed upland forest, chaparral, lower montane coniferous forest, subalpine coniferous forest; granitic, rocky. Elevation: 984-6,232 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are six documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Sidalcea celata</i>	Redding checkerbloom	-	3	April–Aug	Cismontane woodland; sometimes serpentine soils. Elevation: 443-5,000 ft.	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Silene salmonacea</i>	Klamath Mountain catchfly	FSS	1B.2	April–July	Found in openings, usually serpentinite soil, and lower montane coniferous forest. Elevation: 2,545-4,410 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevares and Jurjavic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Stellaria longifolia</i>	long-leaved starwort	–	2B.2	May–Aug	Found in bogs, fens, meadows, seeps (mesic), riparian woodland, and upper montane coniferous forest. Elevation: 2,952-6,002 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Streptanthus ob lanceolatus</i>	Trinity River jewel-flower	FSS	1B.2	April–June	Found in cismontane woodland. Elevation: 65-1,380 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	slender-leaved pondweed	–	2B.2	May–July	Found in marshes and swamps (shallow freshwater). Elevation: 984–7,054 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Trifolium siskiyouense</i>	Siskiyou clover	–	1B.1	June–July	Found in meadows and seeps; mesic. Elevation: 2,886-4,920 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: One historic occurrence of this species from 1912 is documented within the Project area; however, this location (around the town of Montgomery Creek) was mapped by CNDDB and there are no current records of this species within the Project area or vicinity.
<i>Vaccinium shastense</i> ssp. <i>shastense</i>	Shasta huckleberry	–	1B.3	Dec–Sep	Found in acidic and mesic streambanks; sometimes seeps, rocky outcrops, roadsides, and disturbed areas in chaparral, cismontane woodland, lower montane coniferous forest, riparian forest, and subalpine coniferous forest habitats. Elevation: 1,066-4,002 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are four documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Viburnum ellipticum</i>	oval-leaved viburnum	–	2B.3	May–June	Found in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 705-4,592 feet	Project area is within range and supports suitable habitat for this species. However, this species was not observed during surveys conducted in 2009 (Nevarés and Jurjavcic 2009). CNDDB: There are three documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
Unlikely to Occur						
<i>Anisocarpus scabridus</i>	scabrid alpine tarplant	FSS	1B.3	July–Sep	Found in upper montane coniferous forests and in metamorphic/rocky habitats. Elevation: 5,412-7,544 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Botrychium ascendens</i>	upswept moonwort	FSS	2B.3	July–Sep	Found in lower montane coniferous forest, meadows, and seeps. Elevation 4,900-7,500 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are three documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Botrychium crenulatum</i>	scalloped moonwort	FSS	2B.2	July–Sep	Found in fens, lower montane coniferous forest, meadows, seeps, and freshwater marshes. Elevation: 4,900-10,500 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There is one documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Botrychium minganense</i>	Mingan moonwort	FSS	2B.2	July–Sep	Found in fens, lower and upper montane coniferous forest, meadows, and seeps. Elevation: 4,900-6,750 feet.	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are three documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Botrychium pinnatum</i>	northwestern moonwort	FSS	2B.3	July–Oct	Found in lower montane coniferous forest, meadows, seeps, and upper montane coniferous forest; mesic. Elevation: 5,807-6693 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There is one documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Calochortus greenei</i>	Greene's mariposa-lily	FSS	1B.2	June–Aug	Found in cismontane woodland, meadows, seeps, pinyon and juniper woodlands, and upper montane coniferous forests; volcanic soils. Elevation: 3,395-6,200 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Calochortus longebarbatus</i> var. <i>longebarbatus</i>	long-haired star-tulip	FSS	1B.2	June–Aug	Found in Great Basin scrub, lower montane coniferous forest (openings and drainages), meadows, seeps, and vernal pools; clay, mesic soils. Elevation: 3,297-6,234 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles that encompass the Project area.
<i>Campanula shetleri</i>	Castle Crags harebell	FSS	1B.3	June–Sep	Found in lower montane coniferous forest (rocky). Elevation: 4,000-6,000 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Campanula wilkinsiana</i>	Wilkin's harebell	FSS	1B.2	July–Sep	Found in meadows, seeps, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 4,166 - 8,528 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are nine documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Carex comosa</i>	bristly sedge	–	1B.2	May–Sep	Found in coastal prairie, marshes and swamps (lake margins), and valley and foothill grassland. Elevation: 4,166-8,528 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are two documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Carex lasiocarpa</i>	woolly-fruited sedge	–	2B.3	June–July	Found in bogs, fens, marshes, and swamps (freshwater, lake margins). Elevation: 5,576-6,888 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are two documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Chaenactis douglasii</i> var. <i>alpina</i>	alpine dusty maidens	–	2B.3	July–Sep	Found in alpine boulder and rock field (granitic). Elevation: 9,397-11,152 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Chamaesyce hooveri</i>	Hoover's Spurge	FT	1B.2	July–Oct	Found in vernal pools. Elevation: 82-820 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Collomia larsenii</i>	talus collomia	FSS	2B.2	July–Oct	Found in alpine boulder and rock field, closed-cone coniferous forest, subalpine coniferous forest, and upper montane coniferous forests. Elevation: 7,250-11,480 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project.
<i>Cuscuta jepsonii</i>	Jepson's dodder	–	1B.2	July–Sep	Found in north coast coniferous forest; streambanks/annual vine (parasitic). Elevation: 3,936-7,544 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles that encompass the Project area.
<i>Draba carnosula</i>	Mount (Mt.) Eddy draba	FSS	1B.3	July–Aug	Found in subalpine coniferous and upper montane coniferous forests; serpentinite, rocky soils. Elevation: 6,350-9,840 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Drosera anglica</i>	English sundew	–	2B.3	June–Sep	Found in bogs, fens, meadows, and seeps. Elevation: 4,264-7,396 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles that encompass the Project area.
<i>Erigeron nivalis</i>	snow fleabane daisy	–	2B.3	July–Aug	Found in alpine boulder and rock field, meadows, seeps, and subalpine coniferous forest; volcanic, rocky. Elevation: 5,691-9,512 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are two documented occurrences of this species within the 22 quadrangles that encompass the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Eriogonum alpinum</i>	Trinity buckwheat	FSS, CE	1B.2	June–Sep	Found in alpine boulder and rock field, subalpine coniferous forest, upper montane coniferous forest; serpentinite, rocky. Elevation: 7,169-9,514 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Eriogonum pyrolifolium</i> var. <i>pyrolifolium</i>	pyrola-leaved buckwheat	–	2B.3	July–Sep	Found in alpine boulder and rock field (sandy or gravelly, pumice). Elevation: 5,494-10,496 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are four documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Erythronium klamathense</i>	Klamath fawn lily	–	2B.2	Apr–July	Found in meadows, seeps, and upper montane coniferous forest. Elevation: 3,936-6,068 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are eight documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Frasera umpquaensis</i>	Umpqua green-gentian	FSS	2B.2	June–July	Found in chaparral, lower montane coniferous forest, meadows, seeps, and north coast coniferous forest. Elevation: 5,100-6,230 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Fritillaria gentneri</i>	Gertner's fritillary	FE	1B.1	Apr–May	Chaparral, Cismontane woodland, and lower montane coniferous forest. Sometimes in serpentine soil. Elevation: 3,297-9,744 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Hulsea nana</i>	little hulsea	–	2B.3	July–Aug	Found in alpine boulder and rock field, subalpine coniferous forest; rocky, gravelly, or volcanic soils. Elevation: 5,642-11,004 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Ivesia longibracteata</i>	Castle Crags ivesia	FSS	1B.3	June	Found in lower montane coniferous forest; granitic, rocky. Elevation: 3,937-4,593 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area
<i>Leptosiphon nuttallii</i> ssp. <i>howellii</i>	Mountain (Mt.) Tedoc leptosiphon	FSS	1B.3	May–Aug	Found in lower montane coniferous forest (serpentinite). Elevation: 4,000-9,185 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Lewisia kelloggii</i> ssp. <i>hutchisonii</i>	Hutchison's lewisia	FSS	3.2	April–June	Found in openings in upper montane coniferous forest, often on slate soils and on soils that are sandy granitic to erosive volcanic. Elevation: 4,800-7,000 feet.	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Lewisia kelloggii</i> ssp. <i>kelloggii</i>	Kellogg's lewisia	–	3.2	April–June	Found in on granitic and volcanic balds. Elevation: 5,000-8,000 feet.	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Meesia uliginosa</i>	broad-nerved hump-moss	FSS	2B.2	July–Oct	Found in damp soil, bogs, fens, meadows, seeps, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 3,970-9,200 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Minuartia stolonifera</i>	Scott Mountain sandwort	FSS	1B.3	May–Aug	Found in lower montane coniferous forest (serpentinite). Elevation: 4,100-4,595 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Ophioglossum pusillum</i>	northern adder's tongue	FSS	2B.2	July	Found in meadows, seeps, marshes, and swamps. Elevation: 3,280-6,560 feet	Unlikely to occur. The Project area is outside the elevational range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Penstemon tracyi</i>	Tracy's beardtongue	FSS	1B.3	June–Aug	Found in upper montane coniferous forest (rocky). Elevation: 6,495-7,250 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Phacelia cookei</i>	Cooke's phacelia	FSS	1B.1	June–July	Great Basin scrub and lower montane coniferous forest. Found in sandy, volcanic soils. Elevation: 3,590-5,580 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Picea engelmannii</i>	Engelmann spruce	–	2B.2	–	Found in upper montane coniferous forest/perennial evergreen tree. Elevation: 3,493-7,003 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Pinus albicaulis</i>	whitebark pine	FSS	CBR	July–Aug	Found in subalpine forest. Elevation: 6,500-7,500 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Polemonium chartaceum</i>	Mason's sky pilot	FSS	1B.3	June–Aug	Found in rocky, serpentinite, granitic, or volcanic soils. Alpine boulder and rock field, subalpine coniferous forest. Elevation: 10,790-14,005 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific Name	Common Name	Federal or State Status	CRPR Rank	Blooming Period/ Fertile	Habitat	Potential for Occurrence
<i>Polemonium pulcherrimum</i> var. <i>shastense</i>	Mount (Mt.) Shasta sky pilot	–	1B.2	June–Sep	Found in alpine boulder and rock field, subalpine coniferous forest, upper montane coniferous forest; sometimes volcanic soils. Elevation: 7,134-12,792 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Raillardella pringlei</i>	showy raillardella	FSS	1B.2	July–Sep	Found in mesic, serpentinite soil. Bogs, fens, meadows, seeps, and upper montane coniferous forest. Elevation: 3,940-7,510 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Rorippa columbiae</i>	Columbia yellow cress	FSS	1B.2	May–Sep	Found in mesic soil. Lower montane coniferous forest, meadows, seeps, playas, and vernal pools. Elevation: 3,940-5,905 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Silene occidentalis</i> ssp. <i>longistipitata</i>	long-stiped campion	–	1B.2	June–Aug	Found in chaparral, lower montane coniferous forest, and upper montane coniferous forest. Elevation: 3,280-6,560 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Silene suksdorfii</i>	Cascade alpine campion	–	2B.3	July–Sep	Found in alpine boulder and rock field, subalpine coniferous forest, and upper montane coniferous forest; volcanic, rocky soils. Elevation: 7,724-10,201 feet	Unlikely to occur. The Project area is outside the elevation range of the species. This species was not observed during surveys conducted in 2009 (Nevares and Jurjavcic 2009). CNDDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.

LEGEND:

Other Federal Status
 FT = Federal Threatened
 FE = Federal Endangered
 FSS = Forest Service Sensitive

State Status
 CE = California Endangered

CNPS (California Native Plant Society) Rare Plant Rank
 1B = rare, threatened or endangered in California and elsewhere
 2B = rare in California but more common elsewhere
 3 = plants about which more information is needed - a review list
 _1 = Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
 _2 = Moderately threatened in California (20-80% occurrences threatened)
 _3 = Not very threatened in California (<20% of occurrences threatened or no current threats known)
 CBR = Considered but Rejected

Sources:

California Native Plant Society (CNPS). Inventory of Rare and Endangered Plants of California. Accessed January 2018. Electronic Database.
 California Natural Diversity Database (CNDDDB). Rare Find 5.0. California Department of Fish and Wildlife, Habitat Planning and Conservation Branch. Accessed October 2017. Electronic Database.
 Calflora. Information on California plants for education, research and conservation. [web application]. Berkeley, California: The Calflora Database [a non-profit organization]. Accessed October 2017. Electronic Database.

Table 3-5 Special-Status Wildlife Species Known to Occur or Potentially Occurring in the Project Area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
Known to Occur					
Fish					
<i>Mylopharodon conocephalus</i>	Hardhead minnow	—	CSC	Low to mid-elevation streams in the Sacramento-San Joaquin drainage. Also present in the Russian River.	Known to occur. Hardhead were observed during surveys conducted for relicensing in Pit 6 and 7 Reservoirs. Unidentified minnows (due to size), which may have been hardhead, were observed within the Lower McCloud River in 2009 within the Project area (Nevares and Liebzig, 2009). CNDDDB: There are four documented occurrences of this species within the 22 quadrangles encompassing the Project area.
Amphibians and Reptiles					
<i>Ascaphus truei</i>	Pacific tailed frog	—	CSC	This species uses cold, rocky streams in humid forests of Douglas-fir, pine, spruce, hemlock, redwood, maple, and alder, with interspersed grassland or chaparral. Elevation for this species can range from sea -level to 8,400 ft (Nafis 2018).	Known to occur. This species was observed within the Project area during relicensing studies in 2008 (Nevares, Shepley, and Champe 2009). Adult and tadpole stages of Pacific tailed frog were observed in Ladybug Creek, a tributary to the Lower McCloud River. CNDDDB: There are 10 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Hydromantes shastae</i>	Shasta salamander	—	CT	Found around cliff faces, vertical cavern walls, and level ground in mixed forests of Douglas fir, pines, and oaks. Lives in moist caves and rock crevices. Mostly associated with limestone outcrops, but one population has been found in a volcanic outcrop, and others in forest areas with no rock outcrops. This species is most commonly found from 800-2,000 ft elevation.	Known to occur. Surveys conducted in 2008 as part of the relicensing identified this species within the Project area (Nevares and Lindstrand III 2008). Individuals were recorded at McCloud Reservoir and Fenders Flat/Pit 7 Afterbay Dam. CNDDDB: There are three documented occurrences of this species within 0.5 mile of the Project area and 39 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Rana boylei</i>	Foothill yellow-legged frog	—	CCT, CSC	Perennial rocky (pebble or cobble) streams with cool, clear water in a variety of habitats from valley and foothill oak woodland, riparian forest, ponderosa pine, mixed conifer, coastal scrub, and mixed chaparral at elevations ranging from 0 to 6,370 feet.	Known to occur. This species was observed within the Project area during relicensing studies completed in 2009 (Nevares, Shepley, and Champe 2009). Individuals were observed at seven sites located between RM 1.4 and 5.7 on the Lower McCloud River and in associated tributaries. Evidence of breeding was observed in four mainstem sites on the Lower McCloud River. Post-metamorphic frogs were also observed in three tributaries. Twelve egg masses were observed in the Lower McCloud River (FERC 2011). Suitable habitat for this species is present within the Project area, and the Project is within the elevation range of this species.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
					CNDDB: There are 26 documented occurrences within the 22 quadrangles encompassing the Project area.
<i>Actinemys marmorata</i>	western pond turtle	—	CSC	Perennial wetlands, slow moving creeks, and ponds, from sea level to 6,000 feet in elevation, with overhanging vegetation and suitable basking sites such as logs and rocks above the waterline.	Known to occur. This species was observed on-site during relicensing surveys completed in 2008 and 2009 (Nevares, Shepley, and Champe 2009, Nevares and Lindstrand 2008). Individuals were observed in the Pit 6 and Pit 7 Reservoirs. Individuals were also observed in the Lower McCloud River. CNDDB: There are 27 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
Birds					
<i>Accipiter gentilis</i>	northern goshawk	—	CSC (nesting)	Middle to high elevation, mature, dense conifer forests for foraging and nesting. Casual (i.e. occasionally) in foothills during winter, northern deserts in pinyon-juniper woodland, and low elevation riparian habitats. 5,500–10,000 feet.	Known to occur. Suitable habitat for nesting and foraging for this species is present within the Project area. No nests were identified during protocol surveys conducted in 2007 and 2008, but six individuals were observed in the Project area. Four detections were 0.5 mile south of Au-Di-Na Campground and the remaining detections were at the southeast end of Pit 6 transmission line (Nevares and Lindstrand 2008). The nearest known Protected Activity Center is located approximately 0.43 mile to the east of the Project area. CNDDB: There are 24 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Empidonax traillii</i>	willow flycatcher	BCC	CE (nesting)	Wet meadow and montane riparian habitats at elevations ranging from 2,000 to 8,000 feet. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows.	Known to occur. Non-territorial individuals were document at Cedar Salt Log, McGill Creek, and Fenders Flat/Pit 7 Afterbay Dam survey areas. Individuals were considered migrants (Nevares and Lindstrand 2008). CNDDB: There are 8 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Falco peregrinus anatum</i>	American peregrine falcon	BCC, FD (nesting)	CD (nesting), CFP	Occurs in greater densities in tundra and coastal habitats, inhabits many terrestrial biomes, none seem to be preferred. Occupied habitat during spring and fall migration may include urban environments.	Known to occur. Several territories were documented within the Project area in large rock outcroppings along the McCloud River, Iron Canyon Creek, Pit 7 Reservoir, and Pit 6 Reservoir. Survey also documented breeding at four territories where at least one young was observed (Nevares, Cosio and Champe. 2008a). CNDDB: There is one documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Haliaeetus leucocephalus</i>	bald eagle	FD Bald Eagle Act,	CE, CFP	Year-round resident in ice-free regions of California. Foraging areas include regulated and unregulated rivers, reservoirs, lakes, estuaries, and	Known to occur. Pre-relicensing surveys located eight bald eagle nesting territories within the Project area (Nevares, Cosio, Champe 2008b). This includes two previously unknown territories on Chatterdown

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
		BCC		coastal marine ecosystems. Majority of bald eagles in California breed near reservoirs and nests are usually located within one mile of foraging habitat.	Creek and McCloud Bridge. Other territories in the Project area are located at McCloud Reservoir, McCloud River, Iron Canyon Reservoir (two), Pit 6 Reservoir, and Pit 7 Afterbay near Pit 7 Dam. Bald eagles are also known to winter in the Project area. CNDDB: There are six documented occurrences of this species within 0.5 mile of the Project area and 40 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Laterallus jamaicensis coturniculus</i>	California black rail	BCC	CT, CFP	Year-round resident of the western slope foothills of the Sierra Nevada mountain range in California. Nests in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation.	Known to occur. Suitable habitat for this species is present within the Project area. CNDDB: One known observation from June 2010 is documented (CNDDB 2018). The observation occurred along California State Route 299 approximately 0.3 mile southwest of Fender's Ferry Road intersection, one mile north-northeast of King Mill Road intersection, north of Round Mountain.
Mammals					
<i>Antrozous pallidus</i>	pallid bat	—	CSC	Inhabits a variety of habitats, including coniferous forests. Rock outcroppings, caves, buildings, and bridges are used for roost sites. Pallid bats are year-round residents that hibernate during the winter months.	Known to occur. Individuals were captured at the Pit 6, and Pit 7 dams and along the existing Pit 7 transmission line corridor. A juvenile was captured at the Pit 7 Dam confirming the presence of a reproductive population. CNDDB: There are no documented occurrences of this species within the 22 quadrangles surrounding the Project area.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	—	CSC	Found in all but alpine and subalpine habitats; most abundant in mesic habitats. Requires caves, mines, or man-made structures for roosting.	Known to occur. One non-reproductive adult female was captured along the margins of McCloud Reservoir. CNDDB: There are two documented occurrences of this species within five miles of the Project area.
<i>Euderma maculatum</i>	spotted bat	—	CSC	The spotted bat forages over open areas and along forest areas, particularly in association with wet meadows, and uses creeks and rivers as a source of water. This species roosts in rock features, often on steep slopes or rock outcrops associated with river drainages.	Known to occur. Suitable habitat for this species is present within the Project area, including foraging habitat and night roosting habitat within the recreational facilities. Individuals were documented at the Pit 4 development area in 2000. Individuals were detected within the construction footprint of the (now-cancelled) McCloud transmission line. CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Eumops perotis californicus</i>	western mastiff bat	—	CSC	The western mastiff bat is found in rock features, often steep slopes or rock outcrops associated with river drainages, under slabs of exfoliating granite,	Known to occur. Individuals were detected at the Pit 6 Dam in 2007. CNDDB: There are no documented occurrences of this species within 22 quadrangles encompassing the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
				or in basaltic columns. This species is an open-air forager and has been detected flying/foraging over reservoirs.	
<i>Lasiurus blossevillii</i>	western red bat	—	CSC	Forages along open streams and rivers; roosts in tree canopy in forest, woodland, riparian, mesquite bosque, and orchards.	Known to occur. Individuals detected year-round at the Pit 7 transmission line. CNDDB: There are no documented occurrences of this species within 22 quadrangles encompassing the Project area.
<i>Pekania pennanti</i>	fisher- west coast DPS	—	CCT, CSC	Large areas of mature and dense forests of red fir, lodgepole pine, ponderosa pine, mixed conifer, and Jeffery pine forests with snags and greater than 40% canopy closure. Known to inhabit areas from sea level along the California and Oregon coasts up to 8,530 feet elevation in the Trinity and Klamath/Siskiyou Mountains in northern California and southern Oregon, and the Sierra Nevada in California (USFWS 2017).	Known to occur. Suitable habitat for foraging is present within the Project area (Nevares, Trawick, Champe 2009). CNDDB: There are 55 documented occurrences of this species within the 22 quadrangles encompassing the Project area. One incidental sighting of this species was recorded in the Project area in 2007 at Forest Road 11 on the northeast side of Iron Canyon Reservoir.
May Potentially Occur					
Fish					
<i>Cottus asperimus</i>	rough sculpin	—	CT, CFP	Restricted to the Pit River above and below the falls at Burney, and the Hat Creek and Fall River sub drainages.	May occur in suitable habitat. The Project area is within the range for this species. During surveys conducted for relicensing in 2009, one unidentified sculpin was observed as well as riffle and pit sculpin (Nevares and Liebig 2009). CNDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Oncorhynchus mykiss</i> ssp. 2	McCloud River redband trout	—	CSC	Lives in small spring fed tributaries of the McCloud River.	May occur in suitable habitat. This species was not observed during surveys conducted for relicensing in 2009 (Nevares and Liebig, 2009). CNDDB: There are four documented occurrences of this species within the 22 quadrangles encompassing the Project area.
Amphibians					
<i>Ambystoma macrodactylum sigillatum</i>	southern long-toed salamander	—	CSC	Inhabits alpine meadows and high mountain ponds and lakes. Found at elevations up to 10,000 ft.	May occur in suitable habitat. Suitable habitat for this species is present within the Project area. CNDDB: There are five documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
Birds					
<i>Accipiter cooperii</i>	Cooper's hawk	—	W (nesting)	Woodland, chiefly of open, interrupted, or marginal type. Nest sites are mainly in riparian growths of deciduous trees, such as canyon bottoms on river flood-plains, and live oaks. Elevation range: sea level to 9,000 feet. Species prefers lower elevations with open habitats including broken woodland and habitat edges.	May occur in suitable habitat. Suitable habitat for this species is not abundant within the Project area. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompassing the Project area.
<i>Agelaius tricolor</i>	tricolored blackbird	BCC	CCE, CSC	Nests near fresh water, and emergent wetlands with cattails or tules, but also in Himalayan blackberry; forages in grasslands, woodland, and agriculture.	May occur in suitable habitat. This species prefers to forage in grassland and open woodland, which are minimal within the Project area. Himalayan blackberry is present within the Project area and may provide nesting habitat. CNDDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Aquila chrysaetos</i>	golden eagle	BCC	CFP	Golden eagles use a variety of habitats including conifer, hardwood or mixed woodland, alpine, grassland, cliff, desert, savannah, and tundra.	May occur in suitable habitat. Suitable foraging and nesting habitat is present within the Project area for this species. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Contopus cooperi</i>	olive-sided flycatcher	BCC	CSC	Breeds in montane and northern coniferous forests, at forest edges and openings, such as meadows and ponds. Winters at forest edges and clearings where tall trees or snags are present. They migrate between their North American breeding grounds and Central American wintering grounds. Elevation: near sea-level to 9,400 feet.	May occur in suitable habitat. Suitable habitat for this species is present within the Project area; however, the nearest occurrence of this species on the eBird database is located approximately 5 miles east of McCloud Reservoir (Sullivan et al. 2009). CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Coturnicops noveboracensis</i>	yellow rail	BCC	CSC	Requires large wet marsh/sedge meadows or coastal marshes with wet soil and shallow, standing water for nesting. Elevation: 4,150 to 5,000 feet	May occur in suitable habitat. Suitable nesting and foraging habitat for this species is available in the Project area. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Cypseloides niger</i>	black swift	BCC	CSC	Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely in interior steep mountain canyons, especially cliffs adjacent to waterfalls. Forages above forests, woodlands, canyons, valleys, and savannas in the vicinity of	May occur in suitable habitat. Suitable foraging habitat for this species is present within the Project area. No sightings within the Project area have been recorded on eBird (Sullivan et al. 2009), however, there are many sightings of this species within the vicinity of the Project area. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
				nesting locations. Breeds locally in Sierra Nevada and Cascade Ranges.	
<i>Progne subis</i>	purple martin	—	CSC	Nest and forages in woodland habitats including riparian, coniferous, and valley foothill and montane woodlands; in the Sacramento region often nests in weep holes under elevated freeways.	May occur in suitable habitat. Suitable nesting and foraging habitat is present for this species within the Project area. CNDDB: There are 10 documented occurrences of this species within five miles of the Project area.
<i>Setophaga petechia</i>	yellow warbler	BCC	CSC	Nests and forages in riparian and oak woodlands, montane chaparral, open ponderosa pine, and mixed conifer habitats.	May occur in suitable habitat. Suitable habitat for this species is present within the Project area. CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Strix occidentalis occidentalis</i>	California spotted owl	BCC	CSC	Nests in old-growth, dense, coniferous forests. Forages in multi-layered mixed conifer, redwood, Douglas fir, and oak woodland habitats, from sea level to elevations of approximately 7,600 feet.	May occur in suitable habitat. Suitable habitat is present within the Project area for this species. The nearest California spotted owl home range and core area to the Project area is approximately 50 miles southeast. CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Strix occidentalis caurina</i>	northern spotted owl	FT	CT, CSC	Nests in old-growth, dense, coniferous forests. Forages in multi-layered mixed conifer, redwood, and Douglas fir. Elevation: sea-level to 7,600 feet.	May occur in suitable habitat. The Project area is within critical habitat for this species and suitable habitat is present. No individuals or active nests were observed in the Project area during relicensing studies (Nevares and Lindstrand 2008). CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
Mammals					
<i>Aplodontia rufa californica</i>	Sierra Nevada mountain beaver	—	CSC	Found in riparian forest, woodland, and scrub habitats, typically with dense growth of small deciduous trees and shrubs, wet soil, and abundance of forbs, in the Sierra Nevada & east slope.	May occur in suitable habitat. Suitable habitat is present for this species within the Project area. CNDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Bassariscus astutus</i>	ringtail	—	CFP	Found in desert scrub, chaparral, pine-oak or conifer woodland habitats with rocky areas and fallen log debris.	May occur in suitable habitat. Suitable habitat for this species is present within the Project area. CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Lepus americanus klamathensis</i>	Oregon snowshoe hare	—	CSC	Found in riparian habitats with thickets of deciduous trees such as alders and willows, dense	May occur in suitable habitat. Suitable habitat for this species is present within the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
				thickets of conifers, and sometimes ceanothus and manzanita.	CNDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Vulpes vulpes necator</i>	Sierra Nevada red fox	FC	CT	Typically occurs throughout the Sierra Nevada at elevations above 7,000 feet in forests interspersed with meadows, or alpine forests. Open areas are used for hunting, and forested habitats for cover and reproduction.	May occur in suitable habitat. Presence of this species was assumed for the purposes of relicensing. CNDDB: There are four documented occurrences of this species within the 22 quadrangles that encompass the Project area.
Unlikely to Occur					
Invertebrates					
<i>Branchinecta conservatio</i>	conservancy fairy shrimp	FE	—	Found in large, turbid, vernal, and playa pools.	Unlikely to occur within the Project area. No suitable habitat is present within the Project area for this species. CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	—	This species inhabits vernal pools and similar ephemeral wetlands. It is most commonly found in grass or mud bottomed pools or basalt flow depression pools in unplowed grasslands. Occurs mostly in vernal pools, although it also inhabits a variety of natural and artificial seasonal wetland habitats, such as alkali pools, ephemeral drainages, stock ponds, roadside ditches, vernal swales, and rock outcrop pools. Whatever the habitat, the wetlands in which this species is found are small, and shallow (mean 5 centimeters).	Unlikely to occur within the Project area. No suitable habitat is present for this species within the Project area. CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Lepidurus packardi</i>	vernal pool tadpole shrimp	FE	—	Found in a variety of natural and artificial seasonally ponded habitat types including: vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe pits, and ruts caused by vehicular activities.	Unlikely to occur. Suitable habitat for this species is not present within the Project area. CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Pacifastacus fortis</i>	Shasta crayfish	FE	CE	Found only in the Fall and Hat Creek sub-drainages of the Pit River system.	Unlikely to occur. This species is limited to the Fall and Hat Creek drainages of the Pit River which are upstream of the Project area. CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
Fish					
<i>Cottus klamathensis macrops</i>	Bigeye marbled sculpin	—	CSC	Found in the upper Pit River and its tributaries, and tributaries to Goose Lake.	Unlikely to occur. The Project area is outside of the known range of this species. During surveys conducted for relicensing in 2009, one unidentified sculpin was observed as well as riffle sculpin (Nevares and Liebig, 2009). Suitable habitat for this species is present within the Project area. CNDDB: There are three documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Lavinia symmetricus mitrulus</i>	pit roach	—	CSC	Found in the upper Pit River and its tributaries, and tributaries to Goose Lake.	Unlikely to occur. The Project area is outside of the known range of this species. This species was not observed during electrofishing and snorkel surveys conducted for relicensing (Nevares and Liebig, 2009). Suitable habitat for this species is present within the Project area. CNDDB: There are four documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Entosphenus tridentatus</i>	Pacific lamprey	—	CSC	Found in Pacific Coast streams north of San Luis Obispo County and in Santa Clara River. Size of runs is declining.	Unlikely to occur. This species was not observed during surveys conducted for relicensing in 2009 (Nevares and Liebig, 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Hypmesus transpacificus</i>	Delta smelt	FT	CE	Found in brackish water below 25 degrees Celsius. Shallow, fresh or slightly brackish backwater sloughs and edge waters with good water quality and substrate are used for spawning. Larvae and juveniles need shallow, food-rich nursery habitat. Adequate flow and suitable water quality are required for adult access to spawning habitat and transport of juveniles to the San Francisco Bay rearing habitat (Center for Biological Diversity 2017).	Unlikely to occur. The Project area is outside of the range of this species. CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Spirinchus thaleichthys</i>	Longfin smelt	FC	CT CSC	Anadromous smelt (family Osmeridae) found in California's bay, estuary, and nearshore coastal environments from San Francisco Bay north to Lake Earl, near the Oregon border (CDFW 2009)	Unlikely to occur. The Project area is outside of the range of this species. CNDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
<i>Oncorhynchus mykiss iridius</i>	Steelhead-Central Valley DPS	FT	—	Populations exist in the Sacramento and San Joaquin rivers and their tributaries.	Unlikely to occur. Due to fish passage barriers, anadromous fish are not present within the Project area. Additionally, this species was not observed during relicensing surveys conducted in 2009 (Nevares and Liebig, 2009). CNDDB: There is one documented occurrence of this species within the 22 quadrangles encompassing the Project area.
<i>Salvelinus confluentus</i>	bull trout	FT	CE	Bottom dwellers that require deep pools in cold water rivers. Need gravel riffles & large volume of cold water to spawn.	Unlikely to occur. This species was extirpated from the McCloud River, which was historically the southernmost and only bull trout population in California, in 1975. Additionally, this species was not observed during relicensing surveys conducted within the Project area (Nevares and Liebig, 2009). CNDDB: There are two documented occurrences of this species within the 22 quadrangles encompassing the Project area.
Amphibians					
<i>Rana cascadae</i>	Cascades frog	—	CSC	Found in riparian and marshy vegetation in mountain lakes, streams, and ponds. The elevation range for this species is 755 to 9,000 feet (Nafis 2018).	Unlikely to occur. Suitable habitat for this species is present within the Project area and the Project is within the elevation range of this species; however, suitable lentic (flowing) habitat was not identified for this species during the relicensing surveys, and no individuals were observed during aquatic species surveys (Nevares, Shepley, and Champe 2009, Nevares and Lindstrand 2008). CNDDB: There are 12 documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Rana draytonii</i>	California red-legged frog	FT	CSC	Breeds in calm streams and permanent, deep, cool ponds with overhanging and emergent vegetation below 5,000 feet elevation. Known to occur adjacent to breeding habitats in riparian areas, heavily vegetated streamside shorelines, and non-native grasslands.	Unlikely to occur. This species is most common in the low lands and foothills. During relicensing surveys conducted in 2007-2009, suitable habitat for this species was not identified (protocol level surveys were not conducted). No California red-legged frog were observed in the Project area during aquatic species surveys (Nevares, Shepley, and Champe 2009, Nevares and Lindstrand 2008). CNDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass this species.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
<i>Rana pretiosa</i>	Oregon spotted frog	FT	CSC	Inhabits aquatic environments within mixed coniferous forest, preferring large marshy areas that are filled by warm springs. Often found near cool, calm, permanent water sources, such as slow streams that meander through meadows, sluggish streams and rivers, marshes, springs, pools, edges of small lakes, and ponds (Nafis 2018).	Unlikely to occur. The Project area is not within the range of this species. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles encompassing the Project area.
<i>Rhyacotriton variegatus</i>	southern torrent salamander	—	CSC	Found in clear, shallow, well-shaded streams, waterfalls, and seepages in mature to old-growth forests. This species can be found from sea-level to 4,500-5,000 ft. (Nafis 2018).	Unlikely to occur. Suitable habitat for this species is similar to that of Pacific tailed frog; during surveys completed for Pacific tailed frog for relicensing, no individuals of this species were observed (Nevares, Shepley, and Champe 2009, Nevares and Lindstrand 2008). CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
Birds					
<i>Asio flammeus</i>	short-eared owl	BCC	CSC	Short-eared owls favor large areas of open grassland. They nest on ground in prairies, hayfields, and sometimes stubble fields.	Unlikely to occur. This species prefers open habitat for nesting and foraging, which does not occur in the Project area. CNDDDB: There are no documented occurrences of this species within in 22 quadrangles that encompass the Project area.
<i>Athene cunicularia</i>	burrowing owl	BCC	CSC	Suitable habitat throughout their breeding range typically includes open, treeless areas within grassland, steppe, and desert biomes. They generally inhabit gently-sloping areas, characterized by low, sparse vegetation.	Unlikely to occur. This species prefers to nest and forage in disturbed areas and in annual grassland that do not grow tall. Suitable nesting and foraging habitat for this species is not present within the Project area. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Buteo swainsoni</i>	Swainson's hawk	BCC	CT (nesting)	Swainson's hawk breeding habitat includes shrub-steppe areas with scattered trees (juniper-sage flats and oak woodlands), large shrubs, and riparian woodlands. Grasslands and agricultural areas are used for foraging.	Unlikely to occur. This species prefers open grassland and agricultural land for foraging, and nests in tall riparian trees, often sycamores or cottonwoods. Suitable nesting and foraging habitat for this species is minimal within the Project area. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Charadrius alexandrinus</i>	snowy plover	BCC, FT	CSC	Found in barren to sparsely vegetated sand beaches, dry salt flats in lagoons, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, river bars, along alkaline or saline lakes, reservoirs, and ponds.	Unlikely to occur. The Project area is not within the range for this species and this species prefers lower elevations along the California coast. There are no sightings recorded for this species on eBird (Sullivan et al. 2009). CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	BCC, FT (nesting)	CE (nesting)	The western yellow-billed cuckoo breeds in riparian habitat along low gradient (surface slope less than three percent) rivers and streams, and in open riverine valleys that provide wide floodplain conditions (greater than 325 ft).	Unlikely to occur. Suitable habitat for this species is not present within the Project area. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Grus canadensis tabida</i>	greater sandhill crane	—	CT, CFP	Winter foraging in cropland, grazed and mowed grassland, pasture, alfalfa fields, and shallow wetlands; roosting sites are flooded and support several inches of water. This species breeds only in Siskiyou, Modoc and Lassen counties and in the Sierra Valley, Plumas and Sierra counties. It winters primarily in the Sacramento and San Joaquin valleys from Tehama County south to Kings County (Zeiner et al. 1990)	Unlikely to occur. Suitable habitat for this species is not present within the Project area and the Project area is on the edge of this specie's range. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Lanius ludovicianus</i>	loggerhead shrike	BCC	CSC	Loggerhead shrikes inhabit open country with short vegetation and well-spaced shrubs or low trees, particularly those with spines or thorns. They frequent agricultural fields, pastures, old orchards, riparian areas, desert scrublands, savannas, prairies, golf courses, and cemeteries. Loggerhead Shrikes are often seen along mowed roadsides with access to fence lines and utility poles. In the absence of trees or shrubs, they sometimes nest in brush piles or tumbleweeds. Found in elevation from sea level to 7,500 feet.	Unlikely to occur. This species prefers open lands such as grassland and agricultural field for foraging. The Project area is outside of the geographical range of this species, which in northern California consists of the Honey Lake Basin in Lassen County, and the Sierra Valley in the Plumas and Sierra Counties and to the south in the Great Basin of Mono County (CDFW 2008). CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
<i>Riparia riparia</i>	bank swallow	—	CT	Found in lowland river systems and nests in colonies. Currently, individuals are common only in portions of California where sandy, vertical bluffs or riverbanks are available.	Unlikely to occur. Project area is north of this species known range. The range for bank swallow stops below and is patchy to the east and north of the Project area. CNDDDB: There is one documented occurrence of this species within the 22 quadrangles that encompass the Project area.
<i>Strix nebulosa</i>	great gray owl	—	CE (nesting)	Nests in old-growth coniferous forests, and forages in montane meadows. Distribution includes high elevations of the Sierra Nevada and Cascade ranges, from 4,500 to 7,500 feet in elevation.	Unlikely to occur. The Project area is not within the elevation range for this species. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.

Scientific	Common Name	Federal Status	State Status	Habitat	Potential for Occurrence
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	—	CSC	Nests in marshes with tall emergent vegetation, often along borders of lakes and ponds; forages in emergent wetlands, open areas, croplands, and muddy shores of lacustrine habitat. This species breeds east of the Cascade Range and Sierra Nevada, in Imperial and Colorado River valleys, in the Central Valley, and at selected locations in the coast ranges west of the Central Valley.	Unlikely to occur. Suitable habitat for this species is sparse throughout the Project area and the Project is not within the range of this species. CNDDDB: There are no documented occurrences of this species within the 22 quadrangles that encompass the Project area.
Mammals					
<i>Canis lupus</i>	gray wolf	FE	CE	Montane woodlands and adjacent grasslands at 4,000 to 5,000 feet in elevation where ungulate prey or livestock are plentiful.	Unlikely to occur. The Project area is not within the elevation range for this species. CNDDDB: There are no documented occurrences for this species within the 22 quadrangles that encompass the Project area.
<i>Gulo gulo luteus</i>	California wolverine	PT	CT, CFP	Mixed conifer, red fir, and lodgepole habitats, and probably sub-alpine conifer, alpine dwarf shrub, wet meadow, and montane riparian habitats. This species requires dense cover for resting and reproduction, and open areas for hunting. Dens are found in trees, dead standing trees (snags), downed logs, abandoned beaver lodges, among boulders, rock ledges, in old bear dens, and in caves. Riparian areas are used as travel corridors. Found in the northern Sierra Nevadas in elevation ranges of 4,300 to 7,300 feet (CDFW 2008). Denning habitat consists of caves, cliffs, hollow logs, and other cavities located in rocky areas free of human disturbance.	Unlikely to occur. The Project area is outside of the elevational range for this species. CNDDDB: There are six documented occurrences of this species within the 22 quadrangles encompassing the Project area.

Federal Status
 FC = Candidate Species
 FD = Federal Delisted
 FE = Federal Endangered
 PT = Proposed Threatened
 PE = Proposed Endangered
 BCC = Birds of Conservation Concern

State Status
 CFP = California Fully Protected
 CSC = California Species of Special Concern
 CE = California Endangered
 CT = California Threatened
 CCT = California Candidate Threatened
 W = CDFW Watchlist
Forest Service Status
 FSS = Forest Service Sensitive

Sources:
 California Department of Fish and Wildlife, Natural Diversity Database. October 2017. Special Animals List. Periodic publication. 65 pp.
 California Department of Fish and Wildlife. Fully Protected Animals. Accessed January 2018. Access at http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html
 California Natural Diversity Database (CNDDDB). Rare Find 5.0. California Department of Fish and Wildlife, Habitat Planning and Conservation Branch. Accessed January 2018. Electronic Database.
 United States Department of Agriculture – Forest Service (USFS). 2013. Regional Forester’s List of Sensitive Plant and Animal Species for Region 5.
 United States Fish and Wildlife Service (USFWS). Species List, Information for Planning and Conservation (IPaC). Electronic Database. Accessed October 2017.

Discussion

- a. Have a substantial adverse effect, either directly or through habitat modifications, on 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 Wildlife or the US Fish and Wildlife Service?**

Impact: Less Than Significant

For the purposes of this element, an adverse effect on a species would be considered substantial, and thus significant, if it resulted in the loss of a sufficient number of a species to impair ongoing efforts to recover the species.

As provided in Exhibit E of the Application for New License (PG&E 2009), FERC's final EIS (2011), and USFS 4(e) conditions, the Proposed Project includes implementation of increased minimum instream flows (MIFs) from McCloud and Iron Canyon Dams into their respective downstream reaches, and a continued MIF release of 150 cubic feet per second (cfs) to the Pit River below Pit 7 Dam when Shasta Lake is lower than 1,055 feet msl. The Proposed Project includes implementation of ramping rates to protect fish, macroinvertebrates, and FYLF below McCloud Dam:

- > Up-ramping at 100 cfs per hour prior to uncontrollable spills at McCloud Dam.
- > Down-ramping at 150 cfs each 48 hours at McCloud dam during spills controllable by valve.
- > Maximum up-ramping during controllable spills at 200 cfs each 24 hours at McCloud Dam.
- > Up-ramping and down-ramping related to testing of the flow valve at Iron Canyon Dam in 20 cfs increments.

As part of the Proposed Project, PG&E will develop and implement an Aquatic Biological Monitoring Plan, Erosion and Sediment Control Management Plan, Storm Water Pollution Prevention Plan (SWPPP), Coarse Sediment Management Plan, Large Woody Debris Plan, Water Quality and Temperature Monitoring Plan, Terrestrial Biological Management Plan, and Vegetation, and Invasive Weed Management Plan. Results of monitoring required by the plans will be reviewed annually by a Technical Review Group, which will develop of adaptive management actions as needed. Because these plans are components of the Proposed Project presented to the State Water Board for certification, they are included in the following environmental analysis. As a whole, the Proposed Project will not result in significant impacts to Biological Resources. In addition, PG&E will develop Project-specific Biological Evaluations for USFS approval and continue its existing environmental training. These plans and requirements are summarized below.

- > Aquatic Biological Monitoring Plan. PG&E is required to finalize the draft Aquatic Biological Monitoring Plan (PG&E 2010) in consultation with resource agencies (i.e., USFS, CDFW, USFWS, and the State Water Board). The Aquatic Biological Monitoring Plan will monitor and survey fish populations, BMI, aquatic mollusks, western pond turtles, USFS sensitive frog species, and resident fish passage. Once

approved and finalized, the Aquatic Biological Monitoring Plan will be implemented as part of the Proposed Project, consistent with Measure 14 as cited in Exhibit E of the Application for New License (PG&E 2009), FERC's final EIS (2011), and USFS 4(e) condition number 27.

- > Erosion and Sediment Control Management and Storm Water Pollution Prevention Plans. PG&E is required to finalize the draft Erosion and Sediment Control Management Plan and a SWPPP (for construction activities) (PG&E 2010).

The Erosion and Sediment Control Management Plan would require PG&E to inventory, record, treat, and monitor Proposed Project-related erosion and sedimentation impacts to the Proposed Project area and affected USFS lands and waters. The Erosion and Sediment Control Management Plan would include: updating erosion and sediment Inventory and Risk Rating and development of a monitoring schedule; development of a ranking process that incorporates risk rating and hazard assessment and a schedule to repair erosion sites based on the rankings and other management considerations; development of site specific erosion control measures; development of emergency erosion control measures; and development of temporary erosion control measures for planned construction, reconstruction, and heavy maintenance.

PG&E is required to prepare and implement a SWPPP pursuant to the requirements of the National Pollutant Discharge Elimination System (NPDES) Statewide General Permit for Construction Activities. Under the requirements, which are regulated by the Central Valley Regional Water Quality Control Board (CVRWQCB), the Proposed Project will be required to implement Best Management Practices (BMPs) for the control of erosion and sedimentation. Additionally, the provisions of the proposed Erosion and Sediment Monitoring and Control Plan and the Road and Transportation Facility Management Plan would require appropriate controls for erosion during operation and maintenance. All conditions and requirements of the permits will be included with construction specifications and implemented as part of the Proposed Project.

- > Coarse Sediment Management Plan. PG&E is required to finalize the draft Coarse Sediment Management Plan (PG&E 2010) in consultation with resource agencies. The goal of the Coarse Sediment Management Plan is to provide an adaptive management framework for the collection, storage, and augmentation of coarse sediment into the lower McCloud River below McCloud Dam. The Coarse Sediment Management Plan would require monitoring of gravel and coarse sediment augmentation that could benefit downstream aquatic habitat in the lower McCloud River, as well as evaluating possible gravel and coarse sediment sources. Implementation of the Coarse Sediment Management Plan would require the addition of 150 to 600 tons of gravel and coarse sediment. The anticipated source of the gravel and coarse sediment is the Star City Creek delta in McCloud Reservoir.

- > Large Woody Debris Management Plan. PG&E is required to finalize the draft Large Woody Debris Plan (PG&E 2010) in consultation with resource agencies. The Large Woody Debris Management Plan would provide a framework and guidelines for the removal of large woody debris from McCloud Reservoir, and subsequent placement of large woody debris into the McCloud River below the McCloud River Dam to augment recruitment of wood during high water flows, and contribute to the quantity and quality of aquatic habitat along channel margins and in riparian habitat above the low-flow channel.
- > Water Quality and Temperature Monitoring Plan. PG&E's license application included a proposed draft Water Quality Monitoring Plan to identify potential Project impacts on water quality. USFS Final 4(e) condition number 20 requires a Water Quality and Temperature Monitoring Plan, with monitoring requirements that focus on aquatic habitats and water-based recreation on USFS lands.
- > Terrestrial Biological Management Plan. PG&E is required to finalize the draft Terrestrial Biological Management Plan (PG&E 2010) in consultation with resource agencies. The Terrestrial Biological Management Plan would require descriptions of monitoring methodologies, pre-construction survey protocols, and avoidance and protection measures for northern goshawk, bald eagle, peregrine falcon, willow flycatcher, communities of breeding birds, special status bats, and forest carnivores. Once finalized and approved by appropriate agencies, the Terrestrial Biological Management Plan will be implemented as part of the Proposed Project, consistent with Measure 14, as cited in Exhibit E of the Application for New License (PG&E 2009), FERC's final EIS (2011), and USFS 4(e) condition number 26.
- > Vegetation and Invasive Weed Management Plan. PG&E is required to finalize the draft Vegetation and Invasive Weed Management Plan (PG&E 2010) in consultation with resource agencies. The Vegetation and Invasive Weed Management Plan would: (a) identify, monitor, and protect individuals and populations of special status species, and culturally significant plant species to maintain well-distributed, viable populations; (b) specify allowable treatment methods for Project operation and maintenance practices to minimize the introduction and spread of invasive plant species (including integration of USFS Region 5 Invasive Weed BMPs); (c) protect wetland areas; and (d) restore native vegetation in areas disturbed by Project operation and activities. Once approved and finalized, the Vegetation and Invasive Weed Management Plan will be implemented as part of the Proposed Project, consistent with Measure 13, as cited in Exhibit E of the Application for New License (PG&E 2009), FERC's final EIS (2011), and USFS 4(e) condition number 25.
- > Project-Specific Biological Evaluations. PG&E is required to prepare for USFS approval a Biological Evaluation (BE) addressing the potential effects of any action to construct Proposed Project features on USFS lands. The evaluation would include procedures to minimize any adverse effects, meet any management plan restrictions, and monitor implementation and effectiveness of any measures taken as part the construction (including applicable USFS Region 5 and PG&E BMPs). This will apply to

and protect terrestrial and aquatic USFS special status-species, consistent with Measure 15 as cited in Exhibit E of the Application for New License (PG&E 2009), FERC's final EIS (2011), and USFS 4(e) condition number 11.

- > Annual Environmental Training. PG&E will continue to conduct existing annual training in coordination with USFS. Training familiarizes staff with local resource issues, special-status species, invasive plants, applicable avoidance and protection measures, procedures for agency reporting, and applicable USFS orders. Training includes prevention of weed transport (via dirty vehicles), cleaning procedures for rental equipment, cleaning procedures when moving between watersheds, and protection of special-status species. This is consistent with Measure 2, as cited in Exhibit E of the Application for New License (PG&E 2009) and FERC's final EIS (2011).

Aquatic Species

Additional analyses of potential environmental impacts on aquatic resources can be found in FERC's final EIS (FERC 2011), Section 3.3.2.2, *Environmental Effects*, pages 127 through 166.

Benthic Macroinvertebrates

There are no BMI species that have been identified as a candidate, sensitive, or special-status species in the Proposed Project area; therefore, the Project would have no impact on candidate, sensitive, or special-status BMI species.

More generally, operation of the Project raises the possibility of a potential impact to the general BMI species assemblage in the Proposed Project area by affecting the amount of wetted bed habitat, the amount of coarse sediment substrate, water quality (e.g., turbidity), or water temperature in: (a) the McCloud River below McCloud Reservoir; (b) Iron Canyon Creek below Iron Canyon Reservoir; or (c) in the Pit River below the Pit 7 Dam. However, if the Proposed Project results in these potential impacts, the impacts will not be significant because implementation of increased MIFs from McCloud and Iron Canyon Dams into their respective downstream reaches and continued MIF release of 150 cfs to the Pit River below Pit 7 Dam when Shasta Lake is lower than 1,055 feet msl would benefit the amount of wetted bed habitat for BMI. Implementation of ramping rates would reduce stranding or scouring of BMI. With implementation of these components of the Proposed Project, there would be no significant adverse impacts to BMI habitat or species assemblage present in the Proposed Project area.

Aquatic Mollusks

There are no aquatic mollusk species that have been identified as a candidate, sensitive, or special-status species in the Proposed Project area; therefore, the Project would have no impact on candidate, sensitive, or special-status aquatic mollusk species.

More generally, operation of the Project raises the possibility of a potential impact to the general aquatic mollusk species assemblage in the Proposed Project area by affecting the amount of wetted bed habitat, the amount of coarse sediment substrate, water quality (e.g., turbidity), or water temperature in: (a) the McCloud River below McCloud Reservoir; (b) Iron

Canyon Creek below Iron Canyon Reservoir; or (c) in the Pit River below the Pit 7 Dam. However, if the Proposed Project results in these potential impacts, the impacts will not be significant because implementation of increased MIFs from McCloud and Iron Canyon Dams into their respective downstream reaches and continued MIF release of 150 cfs to the Pit River below Pit 7 Dam when Shasta Lake is lower than 1,055 feet msl would likely benefit the amount of habitat for aquatic mollusks. Implementation of ramping rates would reduce potential stranding or scouring of aquatic mollusks. With implementation of these components of the Proposed Project, there would be no significant adverse impacts to the general aquatic mollusk habitat or species assemblage present in the Proposed Project area.

Fish

Hardhead are the only special-status species fish species present in the Proposed Project area. Hardhead are present in Pit 6 and Pit 7 Reservoirs and Pit 7 Afterbay. Operation of the Proposed Project raises the possibility of a potential impact to the habitat for hardhead, particularly by altering the water temperature in the transition-zone habitats where they occur. The Proposed Project could also impact other potential habitat factors, such as the amount of physical habitat available and water quality (e.g., turbidity). However, if the Proposed Project results in these potential impacts, the impacts will not be significant because continued operation of the Pit 7 and Pit 6 Reservoirs, Pit 7 Afterbay, and continued MIF release of 150 cfs to the Pit River below Pit 7 Dam when Shasta Lake is lower than 1,055 feet msl would maintain water temperature and physical habitat conditions for hardhead. Implementation of the Aquatic Biological Monitoring Plan, Erosion and Sediment Control Management Plan, Water Quality and Temperature Monitoring Plan, applicable BMPs, and required agency permits would continue to support the existing habitat; therefore, the Proposed Project would not result in significant adverse impacts to the hardhead or hardhead habitat in the Proposed Project area. Potential turbidity-related impacts are also discussed in Section 3.2.10, Hydrology and Water Quality.

More generally, other fish species that are currently present in the Proposed Project area, such as rainbow and brown trout, could also be affected by operations of the Proposed Project that affect the amount of physical habitat, stranding rates, coarse sediment recruitment and movement, large woody debris supply, water temperature, and water quality (e.g., turbidity). However, implementation of increased MIFs from McCloud and Iron Canyon Dams into their respective downstream reaches and continued MIF release of 150 cfs to the Pit River below Pit 7 Dam when Shasta Lake is lower than 1,055 feet msl would benefit the amount of physical habitat for these species. In addition, implementation of ramping rates would reduce fish stranding. With implementation of these components of the Proposed Project, there would be no significant adverse impacts to the other fish species or their habitat in the Proposed Project area.

Amphibians

FYLF, a candidate species for listing as California threatened and California species of special concern, were observed at seven sites (and associated tributaries) in the Project affected Lower McCloud River reach between RM 1.4 and RM 5.7. Pacific tailed frogs, a

California species of special concern, were found in a tributary to the Lower McCloud River, but not in a reach that could be affected by the Proposed Project. Operation of the Proposed Project raises the possibility of impacts to water temperature and the physical habitat of FYLF in the downstream reach of the Lower McCloud River. For example, increased flows could reduce water temperature below those acceptable for development of tadpoles, or out-of-season flow fluctuations (high or low) could scour or desiccate egg masses or tadpoles.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant because implementation of seasonal MIFs from McCloud Reservoir would not be detrimental to FYLF with regards to physical habitat or water temperature, and implementation of ramping rates would reduce potential stranding or scouring of FYLF or their habitat. With implementation of these components of the Proposed Project, impacts to FYLF and their habitat in the Proposed Project area would not be significant.

Terrestrial Species

Additional analyses of environmental impacts on terrestrial resources can be found in FERC's final EIS (FERC 2011), Section 3.3.3.2, *Environmental Effects*, pages 182 through 218; and in Section 3.3.4, *Threatened and Endangered Species*, pages 221 through 227.

Reptiles

WESTERN POND TURTLE

Western pond turtles were identified in Pit 6 and Pit 7 Reservoirs, as well as along the Lower McCloud River. Western pond turtles, if nesting in uplands surrounding these reservoirs, could potentially be directly affected by activities that involve ground disturbance and vegetation removal including, but not limited to, construction of new recreation facilities or Project maintenance activities such as road grading, slide removal, roadside vegetation removal, fuels management, or other ground-disturbing activities.

Operation of the Project could potentially affect western pond turtle nesting sites near the Lower McCloud River shoreline through inundation, if summer spills occur at McCloud Dam or from tributary accretion below McCloud Dam during summer thunderstorms. However, summertime spills at McCloud Dam are not a part of normal operations, and as such, are expected to occur infrequently. Placement of large woody debris in the Lower McCloud River may potentially benefit western pond turtle habitat quality and quantity, as well as increase the number of basking sites.

Project maintenance activities could also affect aquatic habitats for western pond turtle by degrading water quality. For example, ground disturbing activities could result in increased erosion and sedimentation within the reservoirs and creeks. Fuels from construction vehicles or other equipment, or chemicals from spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant because the Proposed Project includes implementation of plans and measures

including environmental training for Proposed Project staff on special-status species, including western pond turtle; requires herbicide application methods to be designed to avoid sensitive habitats, including aquatic and wetland habitats; and requires development of a BE for construction of new facilities that may affect special-status species, including western pond turtle, the Proposed Project will not result in the potential impacts identified above. The Aquatic Biological Monitoring Plan will include surveys, monitoring, and preconstruction surveys within suitable habitat for western pond turtle along Project reservoirs. Monitoring and survey reports are submitted to USFS and discussed at the Annual Consultation Meeting.

Measures contained in the Erosion and Sediment Control Management Plan and SWPPP will minimize the potential for degradation of aquatic habitats for western pond turtle through the treatment and monitoring of erosion sites, implementation of water quality BMPs, and obtaining and implementing agency permits for construction projects that affect aquatic habitats (refer to Section 3.2.9, Hydrology and Water Quality).

With implementation of these components of the Proposed Project, potential adverse impacts to western pond turtles would not be significant.

Special-Status Plants

Six plant species ranked as CRPR 1, 2, or 3 are known to occur within the Proposed Project area. Of these six, only three have potential to be affected by Project operations and maintenance activities. Potential effects to special-status plants and their habitat result from ground disturbance associated with improvements to existing Project facilities and recreation facilities and construction of new facilities; and ongoing maintenance including grading along roads, vegetation trimming or clearing, and herbicide spraying. As summarized below, populations of Shasta eupatorium, Howell's lewisia, and northern clarkia may potentially be affected by proposed Project activities. The Proposed Project may also affect other special-status plant populations, if identified during comprehensive surveys required under the new license.

- > A small population of five Shasta ageratina (eupatorium) individuals located on bedrock below the high-water mark of the Lower McCloud River may be inundated as a result of increased MIFs below the McCloud Dam.
- > Populations of Howell's lewisia in the vicinity of the Lower McCloud River may be directly affected by ongoing maintenance and recreational activities at the following Project recreation facilities: Lower McCloud River whitewater (boating) put-in; McCloud Dam to Hawkins Creek Crossing whitewater access; and the lower McCloud River Dispersed Recreation Site whitewater access.
- > Northern clarkia could be affected by ground disturbance associated with the expansion of the access road to Hawkin's Landing Campground. Road and transmission line maintenance activities (e.g., grading, vegetation clearing/trimming, and herbicide spraying) along the access road to Hawkins' Landing Campground, the Pit 6 Transmission Line and access road, and the Iron Canyon 12-kV Transmission Line could also affect this species.

However, if the Proposed Project results in these potential impacts, the impacts on special-status plants will not be significant because PG&E will conduct annual training, in coordination with USFS, to familiarize Proposed Project staff with botanical resources that characterize the Project area, including special-status species, invasive plants, and applicable avoidance and protection measures.

In addition, the Proposed Project includes implementation of the Vegetation and Invasive Weed Management Plan. The Vegetation and Invasive Weed Management Plan would protect special-status plants through comprehensive surveys at ten-year intervals, monitoring of known populations, and activity-specific management actions for special-status plant protection. Protective actions may include, but are not limited to, pre-construction surveys in areas of proposed ground disturbance, restriction of disturbances within 100 feet of known populations, and, where appropriate, conducting activities after vegetation has gone to seed and salvage of the top layer of soil to maintain the native seed bank. The Vegetation and Invasive Weed Management Plan also requires that herbicide application treatment methods, where necessary, be designed by licensed Pest Control Advisers (PCAs) and in consideration of site-specific conditions including the location of special-status plants. All chemical application contractors will be qualified, trained, and licensed pesticide contractors and will be audited closely by PG&E personnel or their representatives to insure adherence to rules, regulations, and reporting requirements. The condition of known populations would be assessed during surveys and associated monitoring, and survey/monitoring results would be documented in writing and provided to the USFS for review at the Annual Consultation Meeting.

The required BE must include measures to minimize effects to plants included on the Regional Forester's List of species, which includes state and federally listed plants. The BE must also describe compliance with applicable resource management plans and BMPs. BMPs for prevention of erosion and sedimentation and preservation of water quality will be implemented during ground-disturbing activities or vegetation removal to avoid indirect effects to habitat for special-status plants. Following USFS review and approval, all measures in the BE would be incorporated as part of construction.

The protective measures in the Vegetation and Invasive Weed Management Plan do not address the potential for inundation of the small population of Shasta ageratina located along the Lower McCloud River below the dam. However, potential impacts to the five individuals in this population would be considered less than significant for several reasons. Shasta ageratina is a limestone endemic with a range restricted roughly to the SNTF. The 1995 STNF Land and Resource Management Plan notes that this species is known to occur in suitable limestone habitats within the McCloud and Shasta ranger districts, and that it was removed from the Regional Forester's list of sensitive species prior to 1993. CNDDDB (2018) reports a second population of Shasta ageratina (Occurrence #7) growing in rock crevices along Forest Road 38N11, approximately 50 to 75 feet south of the access stairway leading to the stream gage on the Lower McCloud River. This population was first observed in 1979 with 30 or more individuals; it was not seen during surveys conducted between 1995 and 1997 (and, presumably, was not seen during relicensing surveys in 2008 and 2009) but was observed in 2013 with between 20 and 30 individuals. The close proximity between the two

populations suggest that they are part of a larger metapopulation that fluctuates in extent and in number over time. Loss of one or more individuals during inundation would not otherwise restrict the overall size or health of the larger metapopulation (note that the CNDDDB record for the larger population along the road states that it is located high in the rocks, where it would not be affected by road maintenance activities). Shasta ageratina may co-occur with the Shasta salamander, which is another limestone endemic species. Therefore, measures to protect Shasta salamander, described in a section below, may also enhance Shasta ageratina through protection of limestone habitat. As a whole, the impact of the Proposed Project on special-status plants will not be significant.

Invasive Plant Species

A total of 65 species of invasive plants were identified during botanical surveys conducted as a component of the relicensing. Populations of invasive plant species are generally correlated with high levels of disturbance. Proposed operations and maintenance, recreation, or proposed construction activities may therefore facilitate the establishment or spread of weeds in the Proposed Project area. The spread and introduction of invasive plant species could degrade habitats for and compete with special-status plants.

However, if the Proposed Project results in this potential impact, the impact will not be significant because the Vegetation and Invasive Weed Management Plan will ensure control and monitoring of known populations of invasive weeds. Specific treatment methods for populations identified during comprehensive surveys will be developed in consultation with USFS, based on the specific species and site conditions. PG&E will also develop and implement protocols and/or strategies to prevent introduction or spread of invasive weeds including, but not limited to, cleaning of equipment prior to entry into the Project area; use of certified weed-free straw; and use of native plant species for restoration or erosion control. USFS Region 5 Invasive Species BMPs could also be implemented as part of the Vegetation and Invasive Weed Management Plan. As described above, results of invasive weed surveys and monitoring will be provided to USFS for review and discussion at the Annual Consultation Meeting.

With implementation of these components of the Proposed Project, potential adverse impacts to special-status plants from invasive plants would not be significant.

Invertebrates

Valley Elderberry Longhorn Beetle

As described in the previous section, the Proposed Project area supports elderberry shrub habitat for VELB. However, based on revisions to the species' range (USFWS 2014), the Project is no longer in the range for VELB. Therefore, the Proposed Project would have no effect on VELB or its habitat.

Terrestrial Amphibians

Shasta Salamander

Shasta salamanders (*Hydromantes shastae*) are known to occur in limestone rock outcrops and other non-limestone habitats in the vicinity of the McCloud Reservoir and the Pit 7 Afterbay. This species or its habitat could be affected by activities which cause ground disturbance in previously undisturbed areas, including wet areas or seeps (particularly during the reproductive season) and removal or crushing of limestone outcrops. Specifically, improvements to existing recreation facilities and construction of new recreation facilities in the vicinity of McCloud Reservoir and Pit 7 Afterbay could directly affect salamander individuals or destroy or alter suitable habitat. Ongoing maintenance activities at existing facilities that could potentially affect Shasta salamanders include road grading, slide removal, roadside vegetation removal, spraying of herbicides, hazard tree removal, and other ground-disturbing activities that may encroach either into the steep-cut slopes along dirt roads that border the reservoirs, or near the limestone caves on the west shore of McCloud Reservoir near the Battle Creek inlet.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant because the Vegetation and Invasive Weed Management Plan will require herbicide application treatment methods to be designed by licensed PCAs and in consideration of site-specific conditions and the location of suitable habitats for special-status wildlife, including seeps or other features used by Shasta salamanders.

Development of a BE prior to construction of proposed features potentially affecting Shasta salamander is required. Any measures included in the BE will be implemented as part of construction. The BE must also describe compliance with applicable resource management plans and BMPs. Following USFS review and approval, all measures in the BE will be incorporated as part of construction.

The Terrestrial Biological Management Plan would require preconstruction surveys by a qualified biologist in suitable habitat within 150 meters of areas that would be disturbed as part of Proposed Project activities. Results of surveys will be provided to USFS for review within 30 days of the activity. If salamanders are present, avoidance and protection measures would be developed and implemented, if determined necessary through consultation with USFS. Such measures may include, but are not limited to, avoidance of limestone habitats or relocation of individuals to suitable habitat outside the proposed disturbance area (but as close as possible to the occupied habitat).

PG&E will also implement applicable USFS Region 5 and PG&E BMPs, including BMPs to minimize effects to seeps and other water bodies from ground-disturbing activities.

With implementation of these components of the Proposed Project, potential adverse impacts to Shasta salamander would not be significant.

Avian Species

Northern Goshawk

Although no active nests were identified during surveys conducted for the relicensing, northern goshawks were observed in the Proposed Project area, and this species is assumed to be present in suitable habitat in the Project area. Northern goshawks are known to be sensitive to disturbance during their reproductive period (February 15 through September 15). Noise disturbance and human presence associated with construction of new Project facilities or recreation facilities; expansion of existing recreation facilities; and routine maintenance of Project facilities or recreation facilities could affect northern goshawks potentially nesting in the Project area.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant. As described previously, PG&E will provide environmental training for Project staff on special-status species including northern goshawk, and development of a BE for construction of new facilities that may affect northern goshawk is required. In addition, under the Terrestrial Biological Management Plan, PG&E will conduct pre-construction surveys prior to implementation of disturbing activities along the Lower McCloud River corridor. If nests are identified, a limited operating period (LOP) would be in place from February 1 to August 15 within 300 acres around the nest. The Terrestrial Biological Management Plan also would require monitoring of known nests every ten years and comprehensive surveys within all suitable habitat once every ten years during the license term. Monitoring and survey reports would be submitted to USFS and discussed at the Annual Consultation Meeting, as described previously.

With implementation of these components of the Proposed Project, potential adverse impacts to northern goshawk would not be significant.

Willow Flycatcher

Although no nesting willow flycatchers were observed in the Project area, non-territorial individuals were detected at the Iron Canyon Reservoir and Fenders Flat/Pit 7 Afterbay Dam survey areas. Construction of new Project facilities or recreation facilities; expansion of existing recreation facilities; and routine maintenance of Project facilities or recreation facilities could disturb willow flycatcher (or other neotropical migrants) during the migratory period (late April through early June) and reproductive period (mid-May through mid-September), potentially resulting in individuals abandoning suitable nesting territories or causing nest abandonment or nest failure. In addition, Proposed Project operations resulting in fluctuating reservoir elevations in Iron Canyon Reservoir and changes in Pit River flows could result in loss of appropriate habitat.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant. As described previously, environmental training will be conducted for Project staff on special-status species including willow flycatcher; and development of a BE is required for construction of new facilities that may affect willow flycatcher. In addition, under the Terrestrial Biological Management Plan PG&E will conduct pre-construction surveys

within 250 feet of suitable habitat for willow flycatcher prior to disturbing activities during the sensitive period, defined as May 1 to August 1. If breeding birds are present, no non-emergency activities, including regular maintenance actions and irregular activities, such as testing of sirens or cutting hazard trees along roads and power lines, will be conducted within 250 feet of the nest, unless approved by agencies. The Terrestrial Biological Management Plan would also require monitoring of known nests every ten years and comprehensive surveys within all suitable habitat once every ten years during the license term. Monitoring and survey reports are submitted to USFS and discussed at the Annual Consultation Meeting, as described previously.

With implementation of these components of the Proposed Project, potential adverse impacts to willow flycatcher would not be significant.

Peregrine Falcon

Peregrine falcon breeding activity was confirmed at five eyries in large rock outcroppings high above the McCloud River, Iron Canyon Creek, Pit 7 Reservoir, and Pit 6 Reservoir during surveys conducted as a component of the relicensing. Peregrine falcons are sensitive to disturbances during the breeding season (January through August) and are especially susceptible to disturbance during the onset of courtship (January through March). This would include any loud disturbances (e.g., sirens, use of machinery, or blasting) associated with construction of new Project facilities or recreation facilities; expansion of existing recreation facilities; and routine maintenance of Project facilities or recreation facilities. Recreational activities, such as rapid or noisy approaches associated with motorized boating, could also disturb breeding peregrine falcons.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant. The Terrestrial Biological Management Plan would restrict non-emergency activities that could disturb active nests during the LOP for peregrine falcon, defined as February 1 to August 15. Activities restricted during the LOP would include (but are not limited to) construction activities, aerial patrols, tower or pole replacements, vegetation management, road maintenance, hazard tree removal, and testing of warning sirens. If the LOP cannot be observed, pre-construction protocol surveys would be implemented prior to site disturbance in or adjacent to suitable habitat. The Terrestrial Biological Management Plan would also require annual monitoring of known peregrine falcon breeding territories, and comprehensive surveys within all suitable habitat once every ten years during the license term. Monitoring and survey reports are submitted to USFS and discussed at the Annual Consultation Meeting, as described previously.

With implementation of these components of the Proposed Project, potential adverse impacts to peregrine falcons would not be significant.

Bald Eagle

There are eight bald eagle nesting territories in the Proposed Project area, including one at McCloud Reservoir, three along the Lower McCloud River, two at Iron Canyon Reservoir, one at Pit 7 Afterbay, and one at Pit 6 Reservoir. The USFWS National Bald Eagle Management Guidelines (Guidelines) (USFWS 2017) provide activity-specific management recommendations for avoiding bald eagle disturbance (including nest failure, premature fledging of young, and territory abandonment) as a result of new or intermittent activities in the vicinity of bald eagle nests. In general, the Guidelines recommend a 660-foot buffer around active nests for construction projects with a footprint of half an acre or greater, tree removal, and road construction activities; a 1,000-foot buffer for use of helicopters and fixed-wing aircraft (except for authorized biologists trained in survey techniques); and a half mile buffer for blasting or other activities that produce extremely loud noises. New or intermittent Proposed Project activities that could potentially result in disturbance to active nests include construction of new recreation facilities; expansion of existing recreation facilities; routine maintenance of Project facilities or recreation facilities; and recreational use at new facilities. Recreational use at existing recreation facilities, including recreational boating on the reservoirs, is not expected to disturb nesting eagles because the eagles have historically tolerated such activities.

Proposed Project maintenance activities could also affect aquatic foraging habitats for bald eagle by degrading water quality, which could in turn affect prey species (e.g., fish). For example, ground disturbing activities could result in increased erosion and sedimentation in the reservoirs and creeks. Fuels from construction vehicles or other equipment, or chemicals from spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant because it includes implementation of the Terrestrial Biological Management Plan. The Terrestrial Biological Management Plan would state that non-emergency activities that could disturb active nests would be restricted during the bald eagle LOP, defined as January 1 to August 1. Activities restricted during the LOP would include, but are not limited to, construction activities, aerial patrols, tower or pole replacements, vegetation management, road maintenance, hazard tree removal, and testing of warning sirens. The Terrestrial Biological Management Plan would also require annual monitoring of known bald eagle territories (following survey protocols described in the FERC license for the Pit 3, 4, and 5 Hydroelectric Projects). In addition, comprehensive surveys will be conducted within all suitable habitat once every ten years during the license term. Results of surveys and monitoring, including the breeding status of known nests and any adverse reactions to Proposed Project activities, will be provided to USFS 30 days prior to the Annual Consultation Meeting. If it is determined that the Proposed Project is affecting breeding or foraging eagles, new or additional measures will be developed and implemented, in consultation with USFS.

Proposed Project operations are not expected to significantly affect prey availability for bald eagles. Project reservoirs will provide ongoing forage opportunities for bald eagles. The McCloud and Iron Canyon Reservoirs are regularly stocked with catchable-sized salmonids,

which makes otherwise relatively oligotrophic (nutrient-poor) systems good breeding habitat for opportunistic bald eagles (Jackman *et al.* 1999). Nutrient levels throughout the Lower McCloud River are relatively low and may limit bald eagle productivity along the river corridor; however, there is no indication that the Project directly affects these low nutrient levels (refer to Section 3.2.9, Hydrology and Water Quality). Implementation of Proposed Project measures, including increased minimum flows, ramping rates, and other aquatic habitat monitoring and management plans, is expected to maintain fish habitat and fish abundance (i.e., improve bald eagle food resources).

With implementation of these components of the Proposed Project, potential adverse impacts to bald eagles would not be significant.

Northern Spotted Owl

Although no northern spotted owls or nests were identified during studies conducted for the relicensing, this species is assumed to be present in suitable habitat in the Proposed Project area. Northern spotted owls are known to be particularly sensitive to human disturbance and habitat alterations during their reproductive period (February 15 through September 30). Prolonged disturbance can reduce the ability for owls to detect prey, disrupt flight responses, reduce nest attentiveness, and decrease the rate of food delivery to the nest. Noise disturbance and human presence associated with construction of new recreation facilities; expansion of existing recreation facilities; and routine maintenance of Project facilities or recreation facilities could affect northern spotted owl potentially nesting in the Proposed Project area.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant. As described previously, the Proposed Project includes environmental training for staff on special-status species including northern spotted owl, development of a BE for construction of new facilities that may affect northern spotted owl, and implementation of the Terrestrial Biological Management Plan, which requires protocol-level surveys prior to non-emergency activities that could disturb active nests or observance of an LOP during the sensitive period (defined as February 15 to July 10). With implementation of these components of the Proposed Project, potential adverse impacts to northern spotted owl would not be significant.

Mammals

Special-Status Bats

Five special-status bats, including pallid bat, spotted bat, Townsend's big-eared bat, western red bat, and western mastiff bat, are found in the Proposed Project area. Alterations to Proposed Project facilities that provide roosting habitat could affect roosting or hibernating bats. Vegetation management activities, such as fuels treatment or removal of hazard trees, may affect tree-roosting bat species. Proposed Project maintenance activities could increase erosion and sedimentation within the reservoirs and creeks and degrade water quality, which could affect prey species (e.g., aquatic macroinvertebrates). Fuels from

construction vehicles or other equipment, or chemicals from spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant. As described previously, PG&E is required to provide environmental training for staff on special-status bats; develop of a BE for construction of new facilities that may affect special-status species, including bats; and implement the Terrestrial Biological Management Plan. The Terrestrial Biological Management Plan would require disturbing activities to be scheduled to occur outside of the breeding season for special-status bats (May 1 through August 31), to the extent feasible. Protocol surveys are required prior to disturbance during the breeding season, and an LOP will be observed if presence is confirmed. Active roosts will be protected with a buffer of 500 feet. Bat biologists will be consulted prior to removal of bats, modification of roosting structures, or installation of exclusion devices. The Terrestrial Biological Management Plan would also require monitoring of known roosts every ten years and comprehensive surveys within all suitable habitat once every ten years during the license term. Monitoring and survey reports are submitted to USFS and discussed at the Annual Consultation Meeting, as described previously.

In addition, herbicide application methods designed to avoid sensitive habitats, including aquatic foraging habitats for bats, treatment and monitoring of erosion sites, implementation of water quality BMPs, and obtaining and implementing agency permits for construction projects that affect aquatic habitats would reduce potential adverse impacts to pallid bat, spotted bat, Townsend's big-eared bat, western red bat, and western mastiff bat to less than significant. Project operations will not significantly affect prey availability for foraging bats because implementation of Proposed Project increased minimum flows, ramping rates, and aquatic habitat monitoring and management plans are expected to maintain aquatic BMI habitat and abundance. Accordingly, the impact of the Proposed Project on special status bats will not be significant.

Fisher

Proposed Project activities could disturb forest carnivores, including fisher, as a result of noise, human activity and disturbance, ground disturbance, and vegetation removal, particularly trees or snags that could support dens. However, if the Proposed Project results in these potential impacts, the impacts will not be significant. Implementation of environmental training for staff on special-status species, including fisher, and development of a BE for construction of new facilities that may affect fisher or their habitat, will prevent disturbance of fishers. In addition, the Terrestrial Biological Management Plan would require protocol surveys within 30 days prior to construction activities within suitable habitat for fisher or other forest carnivores. If any dens are present, avoidance and protection measures would be developed and implemented, if determined necessary through consultation with USFS. With implementation of these components of the Proposed Project, potential adverse impacts to fishers would not be significant.

Summary

With implementation of Proposed Project components including the Aquatic Biological Monitoring Plan, the Terrestrial Biological Management Plan, the Vegetation and Invasive Weed Management Plan, BE, environmental training, the Erosion and Sediment Control Management Plan, applicable BMPs and adaptive management actions required by other agency permits, impacts related to species identified as a candidate, sensitive, or special-status species would not be significant.

Mitigation Measures: None required.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or the US Fish and Wildlife Service?

Impact: Less Than Significant

For the purposes of this element, effects on riparian habitat or other sensitive natural communities would be considered substantial, and thus significant, if the effect resulted in the long-term loss of more than ten percent of the habitat in question or resulted in permanent fragmentation of habitat.

Riparian habitat in the Proposed Project area could potentially be affected by operations or by other activities that require vegetation removal, including construction of new recreation facilities, improvements to existing facilities and recreation facilities, or vegetation management activities, such as fuels management or hazard tree removal. The potential effects of Proposed Project operations and construction and vegetation management are described and analyzed below. Additional analyses of environmental impacts on riparian resources can be found in FERC's final EIS (FERC 2011), Section 3.3.3.2.1, *Vegetation*, pages 182 through 189.

Proposed Project Operations

The relicensing included studies to determine potential effects of Proposed Project operations on the Lower McCloud River downstream of McCloud Dam. Current large peak flows along the Lower McCloud River, which are similar to those under pre-McCloud-Pit Project conditions, are flows that scour or 'reset' vegetation on gravel and cobble bars. Those studies demonstrate that implementation of the Proposed Project will not result in considerable alteration of the extent of mature riparian vegetation on geomorphic features within the stream channel. The lateral extent (or width) of riparian vegetation along stream channel banks will not appreciably change under the Proposed Project. The linear extent (or length) of riparian vegetation adjacent to the active channel would also remain unchanged. The same riparian community is expected to continue to persist under the Proposed Project operations. Therefore, potential adverse impacts to riparian habitat from Proposed Project operations would not be significant.

Proposed Project Construction and Vegetation Management

Activities that require vegetation removal (e.g., construction of new recreation facilities, improvements to existing recreation facilities, or vegetation management activities including fuels management or hazard tree removal) could potentially result in removal of riparian habitat or impacts to sensitive natural communities. However, if the Proposed Project results in these potential impacts, they will not be significant because measures included in the Vegetation and Invasive Weed Management Plan will minimize effects on sensitive habitats, restore (revegetate) disturbed areas following construction, guide the implementation of BMPs, and protect special-status species, local revegetation sources, and botanical populations essential for wildlife habitat.

The Vegetation and Invasive Weed Management Plan will include measures to: control and monitor invasive weeds (including use of herbicides); restrict all disturbance within a 100-foot buffer of known populations of special-status plant species; install protective fencing around sensitive botanical resources; alert maintenance crews of the location of sensitive resources; collect and salvage topsoil with seed stock (if appropriate); and develop site-specific revegetation plans for sites larger than 0.25 acres (which will require USFS approval). Annual USFS consultation on vegetation management will occur throughout the life of the license.

The Vegetation and Invasive Weed Management Plan would also require that impacted riparian and wetland areas be restored or an equivalent area enhanced. Riparian vegetation greater than 4-inch diameter at chest height that is removed or damaged will be replaced with like species at a 3:1 ratio. Wetlands will be replaced at a 2:1 ratio. Consultation with CDFW and United States Army Corps of Engineers (USACE) may adjust the mitigation ratio. Revegetation sites will be monitored, and remedial actions taken annually if necessary, until success criteria are met (according to site-specific Revegetation Plans) and attained for one year. If success criteria are not met after three years of monitoring and remediation measures, then sites will be evaluated and more substantial remedial measures will be implemented, and monitoring will occur for another two years, for a total of five years of monitoring.

With implementation of these components of the Proposed Project, impacts on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW, USACE or USFWS by Proposed Project activities will not be significant.

Mitigation Measures: None required.

c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Impact: Less Than Significant

For the purposes of this element, effects would be considered substantial, and thus significant, if the result was the long-term loss or conversion of protected wetlands or the violation of applicable standards adopted for the protection of wetlands.

Proposed Project-affected reservoirs and rivers, as well as their tributaries, are considered waters of the United States and are protected under the federal Clean Water Act (CWA). In addition, several wetlands were mapped in the Proposed Project area during vegetation mapping in support of the relicensing application. Construction of new recreation facilities or improvement of existing recreation facilities could potentially result in fill within waters of the United States. For example, construction of four river/shoreline access facilities at McCloud Reservoir, two boat launches at Iron Canyon Reservoir, and one shoreline access facility at Pit 7 Reservoir could potentially require ground disturbance and fill below the waterline of those water bodies. In addition, construction activities could potentially require work within jurisdictional drainages or wetlands that could result in adverse effects.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant. Implementation of the Vegetation and Invasive Weed Management Plan would include pre-construction surveys within all areas of proposed ground disturbance to determine the location of special-status plants or their habitats. If wetlands or other waters of the United States are detected that would be affected by the proposed work, PG&E will obtain permits under the CWA and other authorizations, if required. All conditions and requirements of the permits will be included with construction specifications and implemented as part of the project work.

In addition, applicable measures for the avoidance and protection of sensitive habitats, including wetlands, would be included in the Vegetation and Invasive Weed Management Plan, and implementation of required erosion control and water quality BMPs will further protect waters of the United States and/or wetlands during construction activities. These measures will be included in project-specific BEs. With implementation of these Proposed Project components, adverse impacts to wetlands and other waters of the United States would not be significant.

Mitigation Measures: None required.

d. 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?

Impact: Less Than Significant

For the purposes of this element, interference with the movement of species would be considered substantial, and thus significant, if a project altered migratory corridors or

fishways in a manner than prevented their use by the subject species; and impacts to native wildlife nursery sites would be considered significant if a project prevented use of the sites during the applicable nursery period.

Resident Fish Passage

FERC (2011) noted potential barriers to resident fish passage within the Proposed Project area. Nevares and Marine (2009 [TM 15]) conducted a survey of fish passage within the inundation zone of the reservoirs but found no impediments to the passage of brown or rainbow trout. However, Nevares and Marine (2009 [TM 15]) also noted the potential presence of fish passage impediments upstream of the reservoir fluctuation zone in tributaries to Iron Canyon Reservoir crossed by Forest Road 37N78. At the road crossings, tributaries (McGill Creek, Deadlun Creek, Cedar Salt Log Creek, Little Gap Creek, and Gap Creek) flow through culverts that, in addition to potentially impeding migration of brown and rainbow trout, restrict flow and collect debris, further exacerbating passage problems. Some of the proposed activities could temporarily obstruct fish passage through work areas, such as road improvements across creeks or placement of gravel and large woody debris in the Lower McCloud River.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant. Under the Aquatic Biological Monitoring Plan, Coarse Sediment Management Plan and the Large Woody Debris Management Plan, fish passage would be restored immediately following construction. None of the activities would result in new permanent obstructions or barriers to fish passage through Project area waters. The USFS 4(e) conditions stipulate aquatic biological monitoring (Condition 27) including periodic monitoring of fish passage conditions at the above listed tributaries to Iron Canyon Reservoir. Implementation of the Aquatic Biological Monitoring Plan would include identification and reduction of fish passage impediments in tributaries to Iron Canyon Reservoir. With implementation of these Proposed Project components, potential impacts related to resident fish passage will not be significant.

Fish Entrainment

Entrainment into existing Project facilities can injure or cause mortality to fish species. Nevares and Liebig (2009) examined entrainment potential from the McCloud Reservoir to the Iron Canyon Reservoir (through the McCloud Tunnel), from the Iron Canyon Reservoir to the James B. Black Powerhouse (through the Iron Canyon Tunnel), within the Pit 6 and Pit 7 powerhouses' turbines. Through tagging studies, analyses of swim speed versus approach velocities at intake structures, and assessment of potential survival through turbines, Nevares and Liebig (2009) found entrainment into the James B. Black, Pit 6 and Pit 7 intakes to be low. Fish would not survive through the James B. Black turbines, but survival through Pit 6 and Pit 7 turbines was likely to be quite high. Overall, Nevares and Liebig (2009) concluded that the potential of fish entrainment into existing Project facilities was quite low. In addition, Proposed Project facilities and operations are not significantly different compared to the existing facilities and operations; therefore, higher entrainment than baseline is not likely. Additional analyses of environmental impacts on fish passage can be found in FERC's final EIS (FERC 2011), Section 3.3.2.2, *Environmental Effects*,

pages 160 through 162. Therefore, potential adverse impacts related to fish entrainment will not be significant.

Migratory Bird Movements

Transmission line structures provide perching, roosting, and nesting substrate for some avian species, especially for raptor species that inhabit open areas or habitat where natural structures are lacking (Avian Power Line Interaction Committee [APLIC] 2006). Avian interactions with transmission line structures can cause mortality through electrocution and can cause power outages and reduce transmission system reliability (APLIC 2006). However, if the Proposed Project results in these potential impacts, the impacts will not be significant. Existing Project powerlines (James B. Black, Pit 6, and Pit 7) meet or exceed current APLIC-recommended standards with the exception of several of the configurations associated with the above-ground portion of the Pit 5 1101 circuit distribution line. PG&E records have not documented any avian-caused outages or electrocutions/mortalities on Project power lines. The Proposed Project, therefore, poses a low risk of avian electrocutions on power lines. In addition, implementation of the Terrestrial Biological Management Plan will include measures that further minimize any risk of avian electrocution. This plan requires that PG&E review the list of power lines that are not in compliance with USFWS's Avian Protection Plan Guidelines and to complete retrofits, as appropriate, within three years of FERC license acceptance. Given the low potential for power line-related effects and implementation of the Terrestrial Biological Management Plan, adverse impacts associated with migratory bird movements will not be significant. Additional analyses of environmental impacts on migratory avian species can be found in FERC's final EIS (FERC 2011), Section 3.3.3.2.2, *Wildlife*, pages 209 through 215.

Mitigation Measures: None required.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Impact: No Impact

The Shasta County General Plan contains policies to protect significant fish, wildlife, and vegetation resources and to balance wildlife habitat protection and enhancement with other resource management (County of Shasta 2004). The Proposed Project does not conflict with any relevant aspects of the Shasta County General Plan. Moreover, as discussed above, the Proposed Project includes implementation of various measures that will protect fish, wildlife, and plants in the Proposed Project area during implementation of proposed activities. The Proposed Project will have no impact on local policies or ordinances protecting biological resources.

Mitigation Measures: None required.

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Impact: No Impact

No habitat conservation plans or natural community conservation plans are prepared for the Proposed Project area. The Proposed Project would have no impact.

Mitigation Measures: None required.

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3.2.5 Cultural Resources

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

Cultural resources are defined as any historical or cultural feature, including archaeological sites, historic structures, or objects. Cultural and historical resources include any resources of historical, cultural, or archaeological significance, including historic and prehistoric sites, information, structures, districts, and objects that have association with or are representative of human history or prehistory.

Under CEQA, historical resources are considered part of the environment (Public Resources Code, §§ 21060.5, 21084.1). A “historical resource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California” (Public Resources Code, §§ 21084.1, 5020.1 subd. (j)).

The California Public Resources Code includes the California Register of Historic Resources (CRHR) (Public Resources Code, §§ 4850 et seq.). The CRHR includes historical resources that are listed automatically by virtue of their appearance on, or eligibility for, certain other lists of important cultural resources, and incorporates historical resources nominated by application and listed after public hearing. CEQA requires consideration of potential impacts to resources that are listed or qualify for listing on the CRHR, as well as resources that are significant but may not qualify for listing.

Additional descriptions of cultural resources in the Proposed Project area are provided in FERC's final EIS (FERC 2011), Section 3.3.6, *Cultural Resources*, pages 290 through 308.

Discussion

a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

Impact: Less Than Significant

For the purposes of this element, adverse changes to the significance of a historical resource would be considered substantial, and thus significant, if the changes prevented identification or study of the resource.

Archaeological and historical investigations for the Proposed Project included record searches, archival research, studies to identify Traditional Cultural Properties (TCP), and pedestrian surface survey. Records searches and archival research were conducted at:

- > Northeast Information Center at California State University, Chico;
- > Offices of the STNF;
- > Offices of the Shasta County Historical Society;
- > Shasta County Public Library; and
- > Meriam Library at California State University, Chico.

Studies to identify TCPs were conducted with the assistance of the Pit River Tribe and the Winnemem Wintu Tribe to identify culturally sensitive areas within the Project area (Nevarés and MacDougall 2009). The Project Area of Potential Effect (APE)¹³ (with regards to effects on cultural resources) was subject to pedestrian surface survey. The strategy for pedestrian surface survey was designed for specific terrain within the APE for the purpose of identifying cultural resources (e.g., prehistoric sites, historic sites, and isolated artifacts) in the APE.

Archaeological and historical investigations for the Proposed Project identified 33 isolated artifacts or features and 30 sites (including 28 prehistoric sites, one historic site, and three prehistoric/ historic sites) within the APE (FERC 2011). Two of the sites are eligible for inclusion on the National Register and the CRHR. The eligibility for inclusion of the remaining 28 sites is not yet determined. The TCPs identified 31 locations, several of which are culturally sensitive to the Pit River Tribe. Consultation with the California State Historic Preservation Officer (SHPO) and FERC has determined that four of these locations are eligible for listing on the National Register, 18 are ineligible for listing, and nine remain unevaluated (FERC 2011).

In June 2012, two cultural resources were recorded at Gap Creek. PG&E has recommended one site as not eligible for listing on the National Register of Historic Places and the other site requires formal National Register evaluation, which PG&E plans to do after the license is

¹³ The APE is the study area as identified for the Proposed Project in consultation with the California Office of Historic Preservation.

issued. PG&E will request concurrence from SHPO and the USFS on their recommendation on that site.

In August 2018, an additional record search was conducted at the Northeast Information Center to identify cultural resources that might have been recorded in the Project area since 2011. This record search update indicated that three previously undocumented sites were recorded post-2011. These consist of P45-005084 (Pit 6 Dam and Powerhouse), P45-005085 (Pit 7 Dam and Powerhouse), and P47-005067 (Hearst McCloud River Compound). Of these newly-recorded historic-era resources, the Pit 6 and Pit 7 dams and powerhouses do not appear to have been evaluated for CRHR or National Register listing eligibility. However, P47-005067 has been recommended eligible for National Register listing under Criterion A for its association with the Hearst family and the development of rustic mountain estates in California between 1900 and 1940, and Criterion C for the estate's unique architecture designed by noted architect Julia Morgan.

Activities associated with the Proposed Project raise the possibility of impacts to both known and unknown (but inadvertently discovered) sites and culturally sensitive areas within the Proposed Project APE that are potentially eligible for inclusion on the CRHR. However, if the Proposed Project results in these potential impacts, the impacts will not be significant. The Historic Properties Management Plan component of the Proposed Project outlines continued adherence to federal and state laws and regulations, regular communication with other agencies, the Pit River Tribe, and the Winnemem Wintu Tribe regarding the management of historic properties within the Proposed Project APE. The Historic Properties Management Plan also specifies: general treatment measures for operations and maintenance (including road maintenance); the management of ethnobotanical resources; avoidance, monitoring, stabilization, data recovery, curation, and other treatment measures pertaining to historic properties; and responses to accidental discovery of archaeological sites or human remains. The use of qualified Tribal Cultural Monitors is required during archaeological surveys, site testing, data recovery, non-emergency construction, and maintenance activities requiring ground disturbance that would create a reasonable effect to historic properties, and during long-term historic properties monitoring. Other protocols and procedures in the Historic Properties Management Plan involve educating the public and PG&E staff on protecting cultural resources, inadvertent discoveries, emergency situations, curation of recovered cultural materials, future studies, Project patrolling, monitoring of cultural resources, and general consultation.

As designed and presented to the State Water Board for certification, the Proposed Project will not result in significant adverse impacts to historical resources in the APE. Additional analyses of environmental impacts on cultural and historical resources can be found in FERC's final EIS (FERC 2011), Section 3.3.6.2, *Environmental Effects*, pages 308 through 319.

Mitigation Measures: None required.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Impact: Less Than Significant

For the purposes of this element, adverse changes to the significance of an archaeological resource would be considered substantial, and thus significant, if the changes prevented identification or study of the resource.

Archaeological and historical investigations for the Proposed Project did not identify any unique archaeological resources pursuant to section 15064.5 (FERC 2011). Therefore, the Project would not result in a substantial adverse change in the significance of a unique archaeological resource. However, any project that involves construction and earthmoving raises the possibility of inadvertent discovery of unique archaeological resources during implementation of the project.

The Historic Properties Management Plan component of the Proposed Project includes measures to protect archaeological resources in the event of an inadvertent discovery. Specifically, measures include avoidance, monitoring, stabilization, data recovery, curation, and other treatment measures pertaining to historic properties as well as accidental discovery of archaeological sites or human remains; and the use of qualified Tribal Cultural Monitors during archaeological surveys, site testing, and data recovery, non-emergency construction and maintenance activities requiring ground disturbance that would create a reasonable effect to historic properties, and during long-term historic properties monitoring.

Compliance with the Historic Properties Management Plan as part of the Proposed Project will prevent the Proposed Project from resulting in substantial changes to the significance of currently-unknown archaeological resources. With implementation of these components of the Proposed Project, the impact on archaeological resources pursuant to 15064.5 will not be significant. Additional analyses of environmental impacts on archaeological resources can be found in FERC's final EIS (FERC 2011), Section 3.3.6.2, *Environmental Effects*, pages 308 through 319.

Mitigation Measures: None required.

c. Disturb any human remains, including those interred outside of formal cemeteries?

Impact: Less Than Significant

For the purposes of this element, disturbance of human remains would be considered a significant impact if the disturbance prevented, as appropriate, the recovery or reburial of the remains.

Archaeological investigations and TCP studies did not identify any human remains or cemeteries associated with Native American and/or Euro-American occupation within the APE (FERC 2011). It is not anticipated that Proposed Project-related ground disturbing activities would inadvertently uncover human remains because of relatively poor soil and environmental conditions for the preservation of bone in the APE. Regardless, there are

archaeological sites in Shasta County that contain human remains, and it is possible that sites containing human remains may be present in the APE.

However, the Proposed Project will not result in significant impacts to inadvertently discovered human remains. As part of the Proposed Project, PG&E will implement the Historic Properties Management Plan, which specifically addresses the accidental discovery of human remains. The stipulations in the Historic Properties Management Plan would reduce potential adverse impacts to human remains identified in the APE to less than significant. With implementation of these components of the Proposed Project, impacts to currently unknown human remains will not be significant. Additional analyses of environmental impacts on cultural resources can be found in FERC's final EIS (FERC 2011), Section 3.3.6.2, *Environmental Effects*, pages 308 through 319.

Mitigation Measures: None required.

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3.2.6 Energy

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Primary energy sources come in many forms, including fossil fuels (e.g., oil, natural gas, petroleum) and renewable energy (solar, wind, water, geothermal, biomass). These primary energy sources are either converted to electricity, a second energy source, which powers many homes and businesses, or combusted to power vehicles, equipment, ships, trains, and planes. The table below identifies the amount of energy consumed per capita in California in 2016 by sector and total.

Sector	Million Btu
Residential	35.2
Commercial	37.6
Industrial	47.2
Transportation	79.3
Total	199.3

Source: United States Energy Information Administration (USEIA) 2019

Overall, in 2016 California was the fourth lowest consumer of energy in the United States. California's electricity consumption that has remained relatively flat over the last 40 years (USEIA 2019). This is in part due to the work of the California Energy Commission (CEC), which was established in 1974 by the Warren-Alquist Act. The CEC is the primary energy policy and planning agency in the state. The CEC is responsible for ensuring safe, resilient, and a reliable supply of energy while reducing costs and the associated environmental impacts of energy use. One of the ways the CEC achieves this is from the establishment and enforcement of Title 24, California's Energy Efficiency Standards, which has led to significant savings in energy use and billions in savings from reduced electricity bills.

The Proposed Project will utilize energy from two resource types, including fossil fuels and electricity. Fossil fuel consumption is for the short-term use of construction equipment to develop recreational improvements along with the vehicle trips for the up to five additional caretakers needed to operate and maintain the facilities. Electricity consumption is associated with the use of security lighting and potable water at recreational sites.

Discussion

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Impact: Less Than Significant

For the purposes of this element, a project would be considered to have a significant impact if it posed a substantial risk of excess or unnecessary consumption of energy resources, and the proportional incremental impact of producing the excess or unnecessary energy consumed would itself be considered significant.

Construction of the recreational improvements would result in the temporary consumption of energy from fuel use needed to operate equipment. The Proposed Project will not be wasteful because the equipment will be used on a short-term basis and only when necessary. In addition, there are existing tiered emissions standards for off-road equipment established by the United States Environmental Protection Agency (USEPA) and the CARB. The emissions standards were first implemented in 1995 and were established to limit emissions of criteria air pollutants (e.g., NO_x and PM) and as technology advanced, the standards were further updated to require further pollutant reductions. These reductions are achieved by creating highly efficient combustion engines that maximize fuel efficiency and therefore reduce unnecessary consumption. Furthermore, the recreational improvements are neither wasteful nor unnecessary as they will provide long-term benefits to persons who access them.

Energy consumption for Proposed Project operations is limited to negligible amounts of fuel consumption for the five additional caretaker's vehicle trips for facility maintenance, and for what is necessary from a health and safety perspective, which includes security lighting and availability of a potable water supply. The Proposed Project would have a less than significant impact given the temporary nature of energy consumed during construction and

limited needs for operation, and that there will be no inefficient, wasteful, or unnecessary energy usage associated with the Proposed Project.

Mitigation Measures: None required.

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Impact: No Impact

California has established Renewable Portfolio Standards (RPSs) that require PG&E and other retail sellers to procure 33 percent of total electricity sales from renewable energy sources by 2020 that increase to 60 percent by 2030 (see Section 3.2.8 for more information). PG&E estimates that implementation of the Proposed Project will result in annual lost hydroelectric generation, which is anticipated to qualify as a renewable energy source during the term of the next license, of approximately 44 gigawatt-hours per year (GWh/yr). Other scenarios yield estimated losses of 41, 46, or 61 GWh/yr. Averaged over a year (8,760 hours), the lost hydroelectric generation represents five megawatts (MW) of generating capacity. However, as identified in the California Public Utilities Commission's (CPUC) 2018 California Renewables Portfolio Standard Annual Report, PG&E has already met the 2020 RPS obligations and is well on its way to meeting the 60 percent by 2030 requirement (CPUC 2018). Therefore, the Proposed Project's reduction of hydroelectric generation will not conflict with the goals established in the State's renewable energy plan.

Mitigation Measures: None required.

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3.2.7 Geology and Soils

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii. Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c. 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

The Proposed Project lies within the Klamath Mountain and Cascade Range geomorphic provinces. The landscape in the vicinity of the Project area reflects widespread regional uplift and fluvial incision results in highlands and deep canyons. The upper portion of McCloud Reservoir is underlain by shale and greywacke sandstone. In the middle portion of McCloud Reservoir, metavolcanic rocks are juxtaposed against outcrops of limestone and interbedded

tuffaceous mudstone and sandstone. Erosion tendencies along riparian slopes in the Lower McCloud River vary according to the adjacent rock type. Mafic flows, tuffaceous mudstone, and minor amounts of limestone occur in the lower portion of the reservoir and downstream of McCloud Dam, and exposed rocks are strongly jointed and moderately fractured, forming steep slopes that are generally erosion-resistant. Fractured and weathered metasedimentary and metavolcanic rocks, however, are relatively weak and prone to mass wasting in areas with steep slopes. Survey sites in and around Hawkins Creek are underlain by shale, siltstone, and metavolcanic rocks, with gentle to steep slopes covered with gravelly soils and typically supporting dense mixed conifer and oak woodland vegetation (FERC 2011).

In the Lower McCloud River watershed, soils mantling steep slopes overlaying metasedimentary and metavolcanic rocks are typically thin and rocky, except in areas with convergent topography, where a thicker mantle of soil and colluvium is more susceptible to landslides and debris flow during intense storm events. Active and dormant landslide scars are susceptible to secondary erosion by rock fall and shallow debris slides. Intensely weathered, fine-grained, and highly erodible sedimentary rocks surrounding Iron Canyon Reservoir and the upper portions of Pit 6 Powerhouse Road are particularly susceptible to erosion when disturbed, as are potentially unstable landforms on fractured metamorphic rocks in the Oak Mountain Road corridor and inner gorge of the Lower Pit River.

Soil conditions around the Lower Pit River include highly weathered upland surfaces, which in some places are composed of saprolite. These soils are susceptible to erosion and have a potential for high fine sediment yields if sparsely vegetated or denuded. Soils mantling the generally steep sided canyon slopes are thin and rocky. Debris flows are commonly triggered on steep canyon slopes with convergent topography and thick soil mantle during and following major storm events. These conditions are commonly found in the area of Iron Canyon Reservoir and Dam, as well as in the area of the James B. Black Development.

The Proposed Project area is located in a seismically active region of California (United States Geological Survey [USGS] 2018). The regional seismicity is related to the extensional tectonics of the McCloud and Pit River Basins and the volcanism of the Cascade Range. Numerous faults and lineaments within the Hat Creek Graben, a north-northwest trending structural depression, are located east of the Proposed Project area. The Hat Creek fault is a system of normal faults¹⁴ and is comprised of several segments (including Soldier Creek, Arkright, Cassel, and Old Lumber Mill faults). The segments have a combined length of approximately 35 kilometers (22 miles); the length of the system infers that it is capable of generating magnitude 6.0 to 6.5 earthquakes (Blakeslee and Katterhorn 2010).

The nearest identified active faults to the Proposed Project area are within the Hat Creek Graben, approximately 25 miles east. In addition, other faults are identified in the Proposed Project area. The alignment of the Summit Valley fault crosses the Pit River at the location of the Pit 3 Powerhouse. This fault is considered a potential seismic source and has altered the course of the river (Sawyer 1998). Another potentially active fault, the Hatchet Mountain fault, is mapped south of the Pit River and intersects Hwy 299. Evidence of Quaternary (within the last two million years) displacement on the fault has been identified south of the highway (Sawyer

¹⁴ A normal fault drops rock on one side of the fault *downwards* relative to the other side.

1998). Additional descriptions of geological resources in the Project area are provided in FERC's final EIS (FERC 2011), Section 3.3.1, *Geology and Soils*, pages 64 through 76.

Discussion

Additional analyses of environmental impacts on geologic resources can be found in FERC's final EIS (FERC 2011), Section 3.3.1.2, *Environmental Effects*, pages 76 through 88.

- a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:**
 - i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?**

Impact: No Impact

No identified "active" faults are delineated within the Project area by the Alquist-Priolo Earthquake Fault Zoning Act (Act). An active fault is defined by the Act as a fault which has geomorphic evidence of surface rupture that has occurred within the last 11,000 years. The closest identified active faults to the Project area are the faults within the Hat Creek Graben, located approximately 25 miles to the east. The graben is bound to the west by the Rocky Ledge fault and to the east by the Hat Creek fault and includes the Soldier Creek, Arkright, Cassel, and Old Lumber Mill faults.

Other known faults are located in the vicinity of the Project area. The alignment of the Summit Valley fault crosses the Pit River at the location of the Pit 3 Powerhouse. This fault is considered a potential seismic source and has altered the course of the river (Sawyer 1998). Another potentially active fault, the Hatchet Mountain fault, is mapped south of the Pit River and intersects Hwy 299. Evidence of Quaternary (within the last 2 million years) displacement on the fault has been identified south of the highway (Sawyer 1998).

Earthquakes on the active Hat Creek Graben faults and the potentially active Summit Valley and Hatchet Mountain Faults would not be expected to cause fault rupture within the Project area as their mapped traces are not located within the Project area. Therefore, the Proposed Project will not result in impacts involving fault ruptures.

Mitigation Measures: None required.

- ii. Strong seismic ground shaking?**

Impact: Less Than Significant

The Project area is located with a seismically active region of California. The regional seismicity is related to the extensional tectonics of the Basin and Range and the volcanism of the Cascade Range. Numerous faults and lineaments within the Hat Creek Graben, a north-northwest trending structural depression, have been identified east of the Proposed Project area. The Hat Creek fault is a system of normal faults and is comprised of several segments (including the Soldier Creek fault). The segments have a combined length of approximately 35 kilometers (22 miles); the length of the system infers that it can generate

magnitude 6.0 to 6.5 earthquakes (Blakeslee and Katterhorn 2010). For the purpose of this analysis, all mapped faults with the Hat Creek Graben are considered active and present a risk of generating light to moderate ground shaking in the Project area. The estimated peak ground acceleration, or the maximum ground acceleration that occurs during earthquake shaking, ranges between 0.2 to 0.3 g (the acceleration due to Earth's gravity, equivalent to g-force) for the eastern portion of the Proposed Project area and between 0.1 to 0.2 g for the western portion (California Geological Survey 2006). The expected ground shaking could result in seismically-induced slope failures and liquefaction (see response to iii below). The risk of ground shaking has been present as an existing condition to the existing Project since it was constructed. FERC and the California Department of Water Resources (DWR) Division of Safety of Dams (DSOD) have the regulatory responsibility to ensure that PG&E fully addresses seismic issues as part of their overall facility (dam) safety program. For the purposes of this analysis, a project would be considered to have a significant impact if it would place people or structures in areas at risk of injury or damage in the event of strong seismic shaking.

FERC's Dam Safety Program regulations (18 CFR Part 12D) require a Licensee (PG&E) to retain an independent consultant, every five years, to inspect, review data (geology, seismicity, hydrology, etc.), and prepare Project safety reports that are submitted to FERC. These reports document detailed inspection of the Project facilities, review and evaluation of operations, monitoring of instrumentation, stability analysis, hydrology analysis, as well as geologic hazards, seismicity potential, and seismic safety analyses. Recently, FERC supplemented the requirements of the 18 CFR Part 12D to include a Potential Failure Mode Analysis for each of the dams subject to the 18 CFR Part 12D regulation.

By regulation in the California Water Code, DSOD also has requirements for seismic stability adequacy for all dams under its jurisdiction. These requirements, in general, are satisfied by the same FERC requirements. The most recent FERC Part 12D Safety Reports for McCloud, Iron Canyon, Pit 6, and Pit 7 Dams were prepared in October 2006.

Other than the existing Project facilities that are inspected by FERC in connection with the Part 12D Safety Reports (referred to above), there are no Proposed Project facilities that could cause significant impacts if strong seismic ground shaking occurs. Even if strong seismic ground shaking occurs in the Proposed Project area, the Proposed Project will not result in a significant effect related to risk of loss, injury, or death.

Mitigation Measures: None required.

iii. Seismic-related ground failure, including liquefaction?

Impact: Less Than Significant

For the purposes of this analysis, a project would be considered to have a significant impact if it would place people at risk of injury, or structures at risk of damage, in the event of seismic-related ground failure.

Seismic activity can lead to several different types of hazards. The most common hazard is slope failures induced by seismic shaking. Slope failures adjacent to roads could occur

either upslope or downslope (or both) of road surfaces. In the event of a local moderate earthquake (e.g., a magnitude of 5.0 or greater earthquake on the Hat Creek Fault), seismically-induced land-sliding could be widespread within the Project area. Multiple locations of rock and soil moving from upslope onto road surfaces or failure of roads in the event of downslope ground failures could occur. Remediation for upslope landslides includes removing material from the road surface and adding barricades to control continued movement of debris onto the road. Downslope failure remediations may require reconstruction of the road prism, potentially including construction of retaining walls or other slope revetments. In most cases, remediation would rely upon the ongoing maintenance for the public roadways.

Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking and increased pore water pressures. In this process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure. Since saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in areas where the water table is deep. Clean granular materials, such as sand, have the highest potential for liquefaction; as compared to fine grained sediments (including silt and silty clay) and coarser sediments (such as gravel) which have less potential for liquefaction.

The potential for damage related to liquefaction (e.g., pavement failure or bridge damage) is greatest in areas underlain by saturated Holocene alluvial deposits. Areas of such alluvial deposits are generally restricted to the active channels of rivers and streams within the Proposed Project area and their floodplains. These areas include portions of proposed recreational areas and access roads to Proposed Project facilities. The access roads most vulnerable to liquefaction hazards include the Pit 3, 4, 5 access roads and Hagen Flat Road in areas that are underlain by Pit River alluvium, and Fenders Ferry Road in areas that are underlain by Quaternary alluvium. However, the alluvium of the Pit and McCloud Rivers and their tributaries are predominantly coarse grained (gravels, cobbles, and boulders) and these materials have a low susceptibility for liquefaction.

The Proposed Project includes development and implementation of an Erosion and Sediment Monitoring and Control Plan, which will require periodic updates of the erosion and sedimentation hazards inventory for Project area roads, facilities, recreational areas, reservoir shorelines, and previously identified mass wasting sites. Priority preventative treatment will be given to erosion/mass wasting sites that were previously classified as having a high erosion potential. Additionally, the Road and Transportation Facility Management Plan requires: (a) periodically updating the road condition inventory performed for the Proposed Project (Nevares and Splenda 2009a); (b) routine inspection and maintenance of Project area roads, including cleaning of culverts and ditches; and (c) large (20 cubic yards of slide material) and small (<20 cubic yards) landslide debris removal and road grading. Implementation of the provisions of these plans would reduce the impacts related to land-sliding (including seismically induced landslides) or other mass wasting process.

The California Geological Survey Seismic Hazards Program delineates areas prone to ground failure and other earthquake-related hazards including soil, earthquake-induced

landslides, surface fault rupture, and tsunami inundations. Cities and counties are required to use these maps in their land use planning and building permit processes so that these hazards are identified and mitigated for development projects prior to the next major earthquake (Centers for Disease Control and Prevention [CDC] 2019). Zones of required investigation for possible earthquake faulting, landslides, and liquefaction are delineated and include Alquist-Priolo Earthquake Fault Zones, Liquefaction Zones, and Landslide Zones. Based on review of California Geological Survey Seismic Hazards mapping, the Proposed Project is not located with a “Regulatory” Landslide and Liquefaction Zone, as defined by the CDC (CDC 2019).

However, since alluvial soils have been identified in areas where recreational facilities may be constructed, both USFS and Shasta County require review and approval of site development plans, as applicable, as part of the permitting process for new recreational facilities. USFS Manual 7300, Buildings and Other Structures (USFS 2017) for the STNF specifically requires the Regional Forester to review site development plans, building designs, and all construction proposals for recreation facilities to be located on USFS lands. In approving site selections and development proposals, the Regional Forester will determine whether any site-specific studies are required, such as soils testing for liquefaction. USFS Manual 7300 also requires that recreation facility designs meet applicable recreation facility building standards (e.g., California Building Code [CBC]) as certified by a qualified engineer.

The CBC is based on the International Building Code and contains necessary California amendments that are based on the American Society of Civil Engineers Minimum Design Standards 7-10, which provide requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion in building codes. Structures should be able to: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage but with some nonstructural damage; and (3) resist major earthquakes without collapse, but with some structural as well as nonstructural damage.

Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake. However, it is reasonable to expect that a well-designed and well-constructed structure would not collapse or cause loss of life even in a major earthquake. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California including the Proposed Project. Shasta County enforces the CBC, which establishes building requirements for all new structures based on predicted earthquake intensities. The risk of loss of life and property damage due to seismic activity is assumed to be minimized when a project follows the CBC.¹⁵ With implementation of the Erosion and Sediment Monitoring and Control Plan, Road and Transportation Facility Management Plan, and compliance with USFS and Shasta County building requirements, the

¹⁵ Shasta County. *Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan*, page 4-61. September 2011.

Proposed Project will not have a significant effect related to the exposure of people or structures to seismic-related ground failure, including liquefaction.

Mitigation Measures: None required.

iv. Landslides?

Impact: Less Than Significant

Landslides and land-sliding are general terms used to describe the mass movement of rock, colluvium, or soil down a slope (i.e., mass wasting or slope failure). These terms are applied to a wide range of types of slope failures that are classified on the basis of the earth material involved and the type and rate of slope movement. In general, gravity is the primary force driving the process of land-sliding. The major influences that determine the potential for land-sliding are strength of slope materials, slope geometry and surface, and subsurface hydrology. Given these influences, steep, high slopes developed on relatively weak slope materials are more prone to failure. Land-sliding is also more likely when high groundwater conditions are present (i.e., during periods of intense or prolonged rainfall and spring snow melt). For the purposes of this analysis, a project would be considered to have a significant impact if it would place people or structures at risk of injury or damage in the event of landslides.

The types of landslides can be generally grouped into two classes, shallow and deep-seated failures. Shallow failures, including raveling, rockfalls, and debris slides/flows, are the most common type of failure likely to affect access roads. These slope failures generally involve the movement of relatively small volumes of loose rock and colluvium (i.e., unconsolidated weathered bedrock and soil derived by slope processes). Rockfalls and raveling can occur under dry or wet conditions while debris slides more commonly occur during periods of elevated groundwater conditions.

The hazard presented by raveling is the accumulation of debris in roadside ditches (particularly inboard ditches) and the blockage of culverts. The severity of the hazards associated with rockfalls is generally controlled by the size and frequency of individual rockfalls. Large rockfalls onto access roads have the potential to result in temporary blockage of vehicle passage, or damage to vehicles.

The hazards associated with debris slides or flows are the potential for: (1) access roads to be partially or completely blocked by debris; (2) proposed recreational facilities to be inundated with slide or flow debris from above; and (3) cars to be blocked or overwhelmed by debris flows on roads or in parking areas.

Debris failures on slopes below roads or other facilities could result in damage to road surfaces or recreational facilities (e.g., severe cracking) or partial to complete loss of the ground surface and underlying material. Debris on the surface could be cleared with conventional construction equipment in hours. Barricades could be added to redirect continued movement of debris away from roads. However, repairs to cut-slopes (e.g., regrading) may be required to ensure stabilization of the slope. Repair actions for downslope slides are highly variable and could include resurfacing the roadways or facility areas; filling

lost material and resurfacing; reconstruction of the road prism; construction of retaining walls or other slope revetments; and extensive regrading and supporting the slope.

The potential risk of the blockage of passage (from either class of landslide) at both the primary and alternate access routes during an emergency or long-term closure of recreational facilities is relatively low. In most cases, preventative treatments would be initiated by ongoing maintenance for the public roadways.

Mass wasting and erosion hazards within the Project area were evaluated in the Inventory and Assessment of Erosion and Sediment from Project Construction, Operation, and Maintenance (PG&E 2009a). Several types of landslides were observed within the steep topography of the Project area. Within the McCloud Reservoir and Lower McCloud River Study region, 80 sites of adverse erosion were identified and the cause at three of these sites was identified as mass wasting and ranked as a medium hazard. Landslides and rockfalls are observed along the western margin of the reservoir. At Iron Canyon, two of the 63 identified erosion sites were ascribed to mass wasting and also ranked as medium hazards. Due to the relatively steep terrain of most of the Project area and susceptibility of the fractured bedrock and colluviums (i.e., unconsolidated material derived from slope processes) to mass wasting, future slope failures may develop in other locations that may adversely affect Proposed Project operations. However, with implementation of the aforementioned components of the Proposed Project, impacts related to landslides will not be significant.

The Proposed Project will not have a significant effect related to exposure of people or structures to substantial adverse effects from landslides.

Mitigation Measures: None required.

b. Result in substantial soil erosion or the loss of topsoil?

Impact: Less Than Significant

For the purposes of this element, erosion or loss of topsoil would be considered substantial, and thus significant, if it resulted in the violation of CWA permitting requirements.

Proposed Project implementation includes the construction of new recreation facilities, maintenance of roadways within the Project area, and sediment excavation in support of gravel augmentation for the Lower McCloud River. These activities could result in removal of vegetation and disturbance of surface soils (topsoil) and subsurface soils. If exposed soils are subject to precipitation and/or runoff from adjacent areas, erosion of the soils could result. Transport of runoff could result in the deposition of sediment in sensitive areas such as rivers/streams or wetlands. Additionally, improper management of runoff from roadways could potentially cause erosion of roadside ditches and/or culverts.

However, if the Proposed Project results in these potential impacts, the impacts will not be significant because it includes implementation of a SWPPP pursuant to the requirements of the *General Permit for Stormwater Discharges Associated with Construction and Land*

*Disturbance Activities (Construction General Permit)*¹⁶. Under those requirements, which are regulated by the CVRWQCB, the Proposed Project will be required to implement BMPs for the control of erosion and sedimentation. Such BMPs may include, but are not limited to:

- > Preserve existing vegetation where required and when feasible.
- > Apply temporary erosion controls to remaining active and non-active areas as required by the California Stormwater BMPs Handbook – Construction and the construction contract documents. Reapply as necessary to maintain effectiveness.
- > Implement temporary erosion control measures at regular intervals throughout the defined rainy season to achieve and maintain the disturbed soil area requirements. Implement erosion control prior to the defined rainy season.
- > Implement spill prevention control and countermeasures.
- > Stabilize non-active areas as soon as feasible after the cessation of construction activities.
- > Control erosion in concentrated flow paths by applying erosion control blankets, erosion control seeding, and lining swales, as required in the construction contract documents.
- > Apply seed to areas deemed substantially complete during the defined rainy season.
- > At completion of construction, apply permanent erosion control to all remaining disturbed soil areas.

Documentation of BMPs and an evaluation of their effectiveness would be done through monitoring and associated reporting, as required in the Proposed Project resource management plans.

Additionally, the provisions of the proposed Erosion and Sediment Monitoring and Control Plan and the Road and Transportation Facility Management Plan would require appropriate controls for erosion during operation and maintenance (refer to Chapter 2.4.2) . Erosion controls and regulations are further discussed in Section 4.9, Hydrology and Water Quality.

As Proposed, the Project will not result in significant impacts related to soil erosion or the loss of topsoil.

Mitigation Measures: None required.

¹⁶ Water Quality Order No. 2009-0009-DWQ and National Pollutant Discharge Elimination System No. CAS000002, as amended by Order No. 2010-0014-DWQ, Order No. 2012-0006-DWQ, and any amendments thereto.

- c. 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?**

Impact: Less Than Significant

As discussed in the response to iii and iv above, the Proposed Project has the potential to be adversely affected by seismically induced ground failures, including land-sliding, liquefaction, and other non-seismic mass wasting and erosion. All proposed structures and other improvements would be designed and constructed in compliance with CBC¹⁷ provisions, including those provisions related to foundations, cut and fill slope construction, and roadway design.

Implementation of the requirements of the Erosion and Sediment Monitoring and Control Plan and Road and Transportation Facility Management Plan would further reduce the potential for adverse impacts related to unstable ground conditions to a less than significant level.

Mitigation Measures: None required.

- d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?**

Impact: Less Than Significant

The Natural Resources Conservation Service (NRCS) mapping unit descriptions for all soil units within the Project area (NRCS 2012) indicate that the linear extensibility (a measure of shrink-swell potential or expansiveness) is low to moderate. The predominant soil types surrounding the McCloud Reservoir (including the Neer-Pronto, Neuns-Kindig, and Etsel-Neuns complexes) are generally sandy and gravelly loams developed on bedrock and have low (1.5) linear extensibility. The predominant soils (including the Marpa-Holland, deep families and Holland, deep-neuns families complexes) around the margins of Iron Canyon Reservoir have low to moderate (1.5-4.5) linear extensibility. All foundations for structures roadways and other improvements would be constructed in compliance with the provisions of the CBC related to expansive soils. Therefore, potential adverse impacts to life or property from expansive soil is less than significant.

Mitigation Measures: None required.

¹⁷ The Uniform Building Code was replaced in 2000 by the International Building Code. The CBC is based on the International Building Code.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Impact: No Impact

The Proposed Project does not include the disposal of septage (i.e., household waste) in septic tanks or alternative waste water disposal systems. Sanitary waste disposal needs for the proposed facilities will be served by vault toilets, which would be periodically pumped, and the sewage transported to an appropriate treatment facility. Portable restroom facilities would be used by workers during the construction phase of the Proposed Project. Because no septic tanks are proposed, the Proposed Project will have no impact.

Mitigation Measures: None required.

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Impact: Less Than Significant

For the purposes of this element, impacts to paleontological resources or geologic features would be considered significant if they would prevent identification or study of the resource or feature. A search of the University of California Museum of Paleontology (UCMP) database for Shasta County on May 2, 2012, did not identify any paleontological resources (i.e., fossils) in the Proposed Project APE. Most of the fossils identified in the UCMP files were recovered from caves. There is currently no evidence that the Proposed Project APE includes the presence of paleontological resources. However, any project involving earthmoving and construction raises the possibility of inadvertent discovery of paleontological resources during implementation of the project.

As required in the Historic Properties Management Plan, if paleontological resources are inadvertently discovered during any ground disturbing activity associated with the Proposed Project, all work shall be immediately halted within 50 feet of the discovery, appropriate PG&E staff shall be notified (e.g., cultural resources staff), and if determined appropriate by PG&E staff, a qualified professional archaeologist and/or paleontologist shall inspect the discovery to determine its significance. Any recommendations presented by the archaeologist and/or paleontologist for the protection or recovery of paleontological resources shall be reviewed by PG&E and appropriate agencies. Appropriate and feasible measures will be implemented to protect and/or recover any paleontological resources. Such measures may include, but are not limited to, preservation in place, excavation, documentation, and curation. The Proposed Project thus will not result in significant adverse impacts to unique paleontological resources located in the APE. Additional analyses of environmental impacts on paleontological resources can be found in FERC's final EIS (FERC 2011), Section 3.3.6.2, *Environmental Effects*, pages 308 through 319.

Mitigation Measures: None required.

3.2.8 Greenhouse Gas Emissions

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

The Proposed Project would not create a new permanent stationary source or develop a land use that would generate substantial amount of greenhouse gas (GHG) emissions from mobile or area sources. Temporary construction emissions of GHG would be a small fraction of the estimated 82,275 metric tons of carbon dioxide equivalent (MT CO₂e) emitted annually by off-road vehicles and equipment in Shasta County, which is less than two percent of the overall 4,723,107 MT CO₂e forecasted to be emitted county-wide in 2020. Similarly, marginal increases in recreation use of forest lands would be a small fraction of the estimated 57,175 MT CO₂e emitted annually by recreational activities in Shasta County, which is less than one percent of the County-wide inventory for 2020. These GHG emissions are considered direct emissions because they occur at the same place and time as a result of activity. Electrical energy consumption within Shasta County accounts for an estimated 709,844 MT CO₂e annually from fossil fuel generation resources provided via the grid by PG&E, which is about 15 percent of the county-wide inventory. These GHG emissions are considered indirect emissions because they typically occur elsewhere as a result of demand (Shasta County AQMD 2012).

For hydroelectric generation projects, indirect GHG impacts (both beneficial or non-beneficial) can result from changes in generation as affected by natural stream flow (due to hydrologic conditions), releases from upstream storage reservoirs, MIF requirements, and other flow requirements such as ramping rates. Under the Proposed Project USFS 4(e) conditions, PG&E estimates that annual lost hydroelectric generation during the term of the next license would be approximately 44 gigawatt-hours per year (GWh/yr). Other scenarios yield estimated losses of 41, 46, or 61 GWh/yr. Averaged over a year (8,760 hours), the lost generation represents

five MW of generating capacity, which is less than one percent of the 1,748 MW of installed small hydroelectric generating capacity in the state (CEC 2018).

With the passage of Senate Bill (SB) 1078 in 2002, the California Renewable Portfolio Standard Program was established. This program initially required 20 percent of electricity retail sales to be served by renewable energy sources by 2017; SB 107, passed in 2006, changed this mandate to 20 percent by 2010. SB X1-2, passed in 2011, extended the RPS procurement requirements to 33 percent by 2020. SB 350, passed in 2015, extended the RPS procurement requirements further to 50 percent by 2030; SB 100, passed in 2018, increased this mandate to 60 percent by 2030. Renewable energy sources that count toward RPS procurement requirements include solar, wind, biomass, geothermal, and small hydroelectric facilities (facilities that generate 30 MW or less).

To ensure electricity retail sellers, including PG&E, are on track to meeting their RPS obligations, the CPUC provides annual reports to the state legislature. In the most recent report titled "2018 California Renewables Portfolio Standard Annual Report," the RPS procurement target of 33 percent by 2020 was met by PG&E in 2017 and they are forecasted to have 50 percent renewable energy sources by 2020 and are expected to have excess procurement for the next six years. This excess procurement may be applied to future compliance periods. In fact, PG&E has so much excess eligible RPS procurements that they chose not to conduct annual RPS solicitations in 2016 and 2017. Overall, PG&E has met and exceeded the 2020 RPS obligations and is well on its way to meeting the RPS procurement mandate of 60 percent by 2030 (CPUC 2018). On a local basis, agencies in California are in the process of implementing identified strategies to reduce GHG emissions. On September 25, 2012, Shasta County presented the Draft Shasta Regional Climate Action Plan (Climate Action Plan) to the Shasta County AQMD for acceptance. The Climate Action Plan focuses on turning state mandates into regional and local opportunities, conducting the regional baseline GHG inventory, identifying and understanding the largest sources of GHG emissions, and developing and understanding future GHG emissions projections and mitigations (Shasta County AQMD 2012).

Discussion

a. **Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

Impact: Less Than Significant

For the purposes of this element, the impacts of a project's direct or indirect GHG emissions would be considered significant if they would prevent implementation or attainment of existing GHG reduction strategies or air quality goals. As mentioned above, California's RPS program, which was partly established to reduce emissions of GHGs from the electric sector, requires PG&E to procure 33 percent of total electricity sales from renewable energy sources by 2020, and 60 percent by 2030. PG&E met the 33 percent target in 2017 and is forecasted to procure 50 percent of electricity sales from renewable energy sources by 2020, 17 percent above the mandated requirement. PG&E has the option to use this excess procurement towards future compliance periods. Therefore, the five MW of lost hydroelectric generation capacity associated with the compliance of the Proposed Project

USFS 4(e) conditions would not impede PG&E's ability to meet its RPS obligations. Therefore, the Proposed Project would not result in indirect effects of GHG emissions. The Proposed Project would maintain consistent with the applicable GHG emission reduction strategies identified by Climate Action Plan and the Climate Action Team. Proposed Project impacts related to GHG emissions would be less than significant.

Mitigation Measures: None required.

b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Impact: No Impact

Due to its small scale, the Proposed Project would not conflict with state or local plans, policies or regulations aimed at curbing GHG emissions. Therefore, the Proposed Project would have no impact on any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Mitigation Measures: None required.

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3.2.9 Hazards and Hazardous Materials

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

Proposed Project activities would involve the transport, use, and disposal of certain hazardous materials or substances, such as fuel for equipment and vehicles for on-going operation and maintenance of existing area facilities, construction activities associated with new recreational facilities, and implementation of the Coarse Sediment Management Plan. In addition, herbicides for invasive plant treatments and vegetation management activities along existing transmission and distribution lines would continue to be used.

Discussion

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Impact: Less Than Significant

For the purposes of this element, a project would have a significant impact if it involved ongoing and routine transport, use, or disposal of hazardous materials in a manner that could create a significant hazard to the public or the environment.

The Proposed Project raises the possibility that the temporary transport, use, and disposal of construction-related hazardous materials or substances in the Project area could pose a hazard to the environment or public. However, if the Proposed Project results in these potential impacts, the impacts will not be significant. Proposed Project activities, including construction of new facilities, are required to comply with PG&E's Existing Project spill prevention, control, and countermeasures (SPCC) plans and hazardous materials business plans (HMBP), which require clean-up materials on-site at all times; identify spill prevention, containment, and clean-up measures; and specify appropriate emergency response measures. In the event of a spill, workers will immediately implement appropriate measures to contain and clean-up the spill to minimize environmental impacts and human or wildlife exposure. Additionally, these plans provide that:

- > PG&E crew members will attend a training session on the species and habitat adjacent to the work area to minimize adverse impacts to both.
- > PG&E crews will station spill containment kits at easily accessible locations within the work and staging area(s) to facilitate prompt response in the event of a spill.
- > Secondary containment measures will be implemented for hazardous materials stored in staging areas.
- > In the event of a spill, PG&E will follow proper notification procedures.

PG&E will also implement applicable USFS Region 5 and PG&E BMPs during Proposed Project operation and maintenance activities, as well as improvements to or construction of new facilities to minimize the potential for impacts to water quality through erosion and sedimentation or contamination of water from fuels or other chemicals. Such BMPs may include, but are not limited to:

- > Preserve existing vegetation where required and when feasible.
- > Apply temporary erosion controls to remaining active and non-active areas as required by the California Stormwater BMPs Handbook – Construction and the contract documents. Reapply as necessary to maintain effectiveness.
- > Implement temporary erosion control measures at regular intervals throughout the defined rainy season to achieve and maintain the disturbed soil area requirements. Implement erosion control prior to the defined rainy season.
- > Implement spill prevention control and countermeasures.

- > Stabilize non-active areas as soon as feasible after the cessation of construction activities.
- > Control erosion in concentrated flow paths by applying erosion control blankets, erosion control seeding, and lining swales, as required in the contract documents.
- > Apply seed to areas deemed substantially complete during the defined rainy season.
- > At completion of construction, apply permanent erosion control to all remaining disturbed soil areas.

Though this list is not necessarily complete, the identified measures are sufficient to ensure that the Proposed Project will not result in significant impacts. Refer to Appendix C of the 2010 Draft Project Implementation Guide for a complete list of BMPs (PG&E 2010). Documentation of BMP implementation and an evaluation of their effectiveness would be done through monitoring and associated reporting, as required per the Proposed Project resource management plans.

All conditions and requirements of plans will be included with construction specifications and implemented as part of the Proposed Project. With implementation of these plans and applicable BMPs, impacts resulting from the routine transport, use, or disposal of hazardous materials would not be significant.

Mitigation Measures: None required.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment??

Impact: Less Than Significant

For the purposes of this element a project would have a significant impact if project activities posed a risk of release of hazardous materials into the environment and such a release would itself pose a risk of injury, death, or substantial environmental harm.

Transporting, storing, and using construction-related hazardous materials or substances could result in an accidental and temporary spill that could contaminate soil or water, affect vegetation or wildlife, or expose people to toxic fumes or substances.

However, the Proposed Project will not have a significant impact because all conditions and requirements of SPCC plans and HMBPs will be included with construction designs and implemented as part of the Proposed Project. With implementation of these components of the Proposed Project, impacts related to spills of hazardous materials or substances will not be significant.

Mitigation Measures: None required.

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

Impact: No Impact

None of the Proposed Project activities would be implemented within 0.25 mile of a school. The Proposed Project would have no impact.

Mitigation Measures: None required.

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Impact: No Impact

No active hazardous materials sites exist in the Proposed Project area (California Department of Toxic Substances Control 2018). The nearest active hazardous materials sites are in Redding. No hazardous materials sites would be affected by Proposed Project activities. The Proposed Project would have no impact.

Mitigation Measures: None required.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Impact: No Impact

The Project area does not contain any airports and is not within two miles of an airport. The Proposed Project would have no impact.

Mitigation Measures: None required.

f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Impact: Less Than Significant

As discussed in Section 3.2.16, Transportation and Traffic, Proposed Project activities could result in temporary delays in access through work areas, but access for emergency purposes would not be obstructed or impeded. Emergency responses and evacuations would not be significantly impacted by the Proposed Project. (Additional discussion of potential impacts with emergency response plans is found in Section 3.2.20.)

Mitigation Measures: None required.

g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

Impact: Less Than Significant

The Proposed Project area is located in a very high fire hazard zone that contains vast areas of forest which are subject to periodic wildfire (Cal Fire 2008). Fire suppression is a shared responsibility between the USFS, Cal Fire, and Shasta County. Response times in the event of a fire in the Project area can be long because of the distance to fire stations and equipment (FERC 2011). PG&E maintains fire suppression tools at existing recreation sites and its facilities, and it conducts routine facility maintenance, such as vegetation thinning and trimming under and near power lines and substations, to reduce the fire risk near Existing Project facilities. Increased use of the area once the Proposed Project's recreational developments are complete would increase the risk and potential for fire. Construction activities could also increase the risk of fire, although all equipment will contain appropriate suppression tools and spark arrestors to reduce the potential for fire during construction.

PG&E's Fire and Fuels Management Plan will be finalized in consultation with USFS, Cal Fire, the Big Bend Volunteer Fire Department, and others, as appropriate. The plan will provide information necessary for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Project, as required by USFS condition number 33 (Part II, 4). The Fire and Fuels Management Plan will identify: hazard reduction and fuel treatment measures; actions and locations of resources needed for fire prevention and response; and a process for reporting fires and providing necessary documents associated with any fire investigation to protect the Proposed Project and National Forest resources over the term of the license. Other aspects of fuels management primarily related to vegetation treatments, including powerline clearance, are contained in the separate Vegetation and Invasive Weed Management Plan.

The risk of wildfire would continue to be very high, but implementation of the Fire and Fuels Management Plan and appropriate measures to protect proposed and existing Project facilities and people in the Project area would reduce impacts to less than significant.

Additional discussion of potential impacts related to wildfires is included in Section 3.2.20.

Mitigation Measures: None required.

3.2.10 Hydrology and Water Quality

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial on- or off-site erosion or siltation;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
iii. 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; or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv. Impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

The Proposed Project is located in Northern California in the McCloud and Pit River drainages, along the western slope of the Cascade Range. The Proposed Project is entirely contained within the Sacramento River Hydrologic Region of California (DWR 2005a). The USGS has defined three hydrologic drainage basins within the Proposed Project vicinity. The basins and hydrologic unit codes for the Proposed Project Vicinity are Upper Pit (18020002); Lower Pit (18020003); and McCloud (18020004) (USGS 2005). Within these hydrologic drainage basins, six watersheds were identified for further description within the Proposed Project area: (1) McCloud Reservoir; (2) Lower McCloud River; (3) Iron Canyon Reservoir; (4) Lower Iron Canyon Creek; (5) Upper Pit River; and (6) Lower Pit River.

The McCloud River drainage basin lies within Siskiyou and Shasta Counties and has a total drainage area of approximately 581 square miles. The McCloud River originates southeast of Mt. Shasta at an elevation of approximately 5,500 feet and flows approximately 59 miles in a southwesterly direction through McCloud Reservoir before entering Shasta Lake and joining the Sacramento River. The Pit River basin is divided into the Upper Pit and the Lower Pit basins. The Upper Pit River basin lies within Modoc and Lassen counties and has a total drainage area of approximately 4,899 square miles. It originates from Goose Lake and flows southwesterly to

the Fall River Valley where it enters the Lower Pit River basin. The Lower Pit River basin lies within Shasta County and has a total drainage area of approximately 238 square miles, exclusive of contributing areas from the Upper Pit or McCloud River basins. The Pit River flows southwesterly a distance of approximately 150 miles before entering into Shasta Lake and joining the Sacramento River.

Rivers and streams of the Proposed Project area are typically steep gradient and highly confined, resulting in minimal floodplain development. The largest flood event on record during the study period of 1974–2006 occurred in January 1997, when mean daily flow at the Ah-Di-Na gage downstream of McCloud Dam exceeded 25,000 cfs. The largest flood during the study period in the Pit River watershed occurred in February 1986, when mean daily flow at the gage downstream of Pit 7 Dam reached 49,000 cfs.

PG&E uses water at the Proposed Project for non-consumptive storage and power generation. PG&E also operates the Proposed Project in support of several other beneficial uses identified by (CVRWQCB 2018) for the McCloud River and the Pit River. The CVRWQCB's *Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan)*¹⁸ identifies surface water bodies that drain into the upper Central Valley of California, including the McCloud River and Pit River, and identifies beneficial uses for each major river. The McCloud River is designated for municipal and domestic water supply, contact and non-contact recreation, power production, cold freshwater habitat, coldwater spawning, and wildlife habitat. The Pit River in the Proposed Project-affected reach (between James B. Black Tailrace and Shasta Lake) is designated for all of the beneficial uses designated for the McCloud River, as well as water supply for irrigation and stock watering, warm freshwater habitat, and warmwater spawning.

Although the McCloud River is not listed under section 303(d) of the CWA as an impaired water body, the Pit River is listed for nutrients, organic enrichment, and water temperature (USEPA 2018). The listing cites agriculture and grazing as the probable source of these impairments, and the river is currently listed as a low priority river for the development of total maximum daily load standards (USEPA 2018).

Additional descriptions of hydrology and water quality in the Project area are provided in FERC's final EIS (FERC 2011), Section 3.3.2.1, *Affected Environment*, pages 89 through 117.

Discussion

Additional analyses of environmental impacts on hydrology and water quality can be found in FERC's final EIS (FERC 2011), Section 3.3.2.2, *Environmental Effects*, pages 127 through 155.

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Impact: Less Than Significant

The Proposed Project complies with Basin Plan water quality objectives for fecal coliform and *E. coli*; concentrations of bio-stimulatory substances, nutrients, chlorophyll-a, and

¹⁸ *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region for the Sacramento River Basin and the San Joaquin River Basin*. Fifth Edition. Revised May 2018 (with Approved Amendments).

phytoplankton; drinking water uses and aquatic life protection; water color; dissolved oxygen concentrations; oil and fuels; pesticides; radioactive materials; taste and odor; water temperature; and toxic contamination. A brief discussion of Proposed Project-affected waters in relation to pH levels, erosion and sedimentation, total suspended solids, and turbidity is provided below.

pH Levels

The McCloud River watershed upstream of the Proposed Project area lies on volcanic formations with few calcareous deposits that would serve to buffer natural pH variations. As a result of these inflow conditions, and low levels of algal photosynthesis in McCloud Reservoir, daytime sampling in McCloud Reservoir documented pH levels that occasionally exceed Basin Plan criteria. These exceedances are part of the existing environmental condition. The Proposed Project will not contribute to discharges of substances that directly or indirectly affect pH, and so will have no impact on pH levels.

Sediment

Proposed Project operations and specific maintenance activities at proposed facilities may release suspended sediment to downstream waters. Unpaved roadways and spoil piles may act as sources of sediment during periods of high runoff. Construction of Proposed Project recreational facilities and maintenance activities for roads and structures could result in removal of vegetation and disturbance of surface and subsurface soils. In addition, during relicensing studies, local erosion sources were noted just below Iron Canyon Dam that contribute fine sediment to Iron Canyon Creek.

However, if the Proposed Project results in potential water quality impacts related to sedimentation, the impacts will not be significant because the Proposed Project includes implementation of the Erosion and Sediment Control Management Plan, which requires PG&E to inventory, record, treat, and monitor Proposed Project-related erosion and sedimentation impacts to Project and affected USFS lands and waters. The Erosion and Sediment Control Management Plan will: (a) describe the methods, protocols, and schedule to update the existing baseline erosion survey, and conduct subsequent periodic inventory and monitoring of Proposed Project-related erosion and sedimentation sites; (b) prioritize treatment sites and schedules based on a risk rating and hazard analysis process; (c) require development of site-specific treatment measures; (d) provide emergency erosion control protocols; and (e) include temporary measures to control site-specific erosion and sedimentation impacts during construction or improvement of Proposed Project facilities (including recreation facilities) or heavy maintenance of proposed facilities. These components are consistent with Measure 12, as cited in Exhibit E of the Application for New License and FERC's final EIS (2011) and with USFS 4(e) Condition 22. Results of treatment and monitoring will be submitted to USFS on an annual basis and reviewed at the Annual Consultation Meeting. Final reports, if required, would be filed with FERC.

In addition, as part of the Proposed Project PG&E will implement applicable USFS Region 5 and PG&E BMPs during Proposed Project operation and maintenance activities, as well as improvements to or construction of new facilities to minimize the potential for impacts to

water quality through erosion and sedimentation or contamination of water from the use of fuels or other chemicals. Such BMPs may include, but are not limited to:

- > Preserve existing vegetation where required and when feasible.
- > Apply temporary erosion controls to remaining active and non-active areas as required by the California Stormwater BMPs Handbook – Construction and the contract documents. Reapply as necessary to maintain effectiveness.
- > Implement temporary erosion control measures at regular intervals throughout the defined rainy season to achieve and maintain the disturbed soil area requirements. Implement erosion control prior to the defined rainy season.
- > Implement spill prevention control and countermeasures.
- > Stabilize non-active areas as soon as feasible after the cessation of construction activities.
- > Control erosion in concentrated flow paths by applying erosion control blankets, erosion control seeding, and lining swales, as required in the contract documents.
- > Apply seed to areas deemed substantially complete during the defined rainy season.
- > At completion of construction, apply permanent erosion control to all remaining disturbed soil areas.

Refer to Appendix C of the 2010 Draft Project Implementation Guide for a complete list of BMPs (PG&E 2010). Though this list is not necessarily complete, the identified measures are sufficient to ensure that the Proposed Project will not result in significant impacts. Documentation of BMPs and an evaluation of their effectiveness would be done through monitoring and associated reporting, as required in the Proposed Project resource management plans.

PG&E will also obtain agency-required permits for construction of new recreation facilities, as required by local, California, or federal regulations, on a project-by-project basis. For projects that would disturb one or more acres of soil, PG&E will obtain coverage under the Construction General Permit from the Regional Water Quality Control Board (RWQCB) (or the State Water Board, if applicable) for stormwater discharges associated with construction activity and will prepare a SWPPP. All conditions and requirements of the SWPPP or other permits, including measures to prevent erosion and sedimentation, will be included with construction specifications, and implemented as part of each project. Such permits may include but are not limited to:

- > A Construction General Permit from the RWQCB (or the State Water Board, if applicable) for stormwater discharges associated with construction activity. This applies to all construction projects that would disturb one or more acres of soil. Requires filing a Notice of Intent as well as preparation and implementation of a SWPPP.
- > CWA permits for impacts to Waters of the United States/State from the USACE and the RWQCB (or the State Water Board, if applicable).

- > Lake or Streambed Alteration Agreement from CDFW for impacts within the bed and bank of Project-affected waters.

All conditions and requirements of the permits will be included with construction specifications and implemented as part of the Proposed Project.

With implementation of these components of the Proposed Project, impacts related to water quality standards or waste discharge requirements will not be significant.

Settleable Material

An accumulation of sediment, which originates upstream of the Proposed Project area, continues to occur in McCloud Reservoir. However, there is no evidence that the settleable material is adversely affecting beneficial uses within McCloud Reservoir. The accumulation of sediment in McCloud Reservoir has both positive and negative implications for habitat quality in the Lower McCloud River. As noted above, trapping of sand and finer sediment originating in Mud Creek can have a beneficial effect on aquatic habitat quality through the reduction in suspended particles (i.e., turbidity). Conversely, McCloud Reservoir also interrupts gravel transport and contributes to a reduction in spawning gravel quality and quantity between McCloud Dam and Hawkins Creek. Refer to Section 3.2.4, Biological Resources, for a discussion of Proposed Project effects on fish and their habitat. With implementation of the Coarse Sediment Management Plan and the Erosion and Sediment Control Management Plan components of the Proposed Project, the potential adverse impacts related to settleable material from the Proposed Project will not be significant.

Suspended Material

Mud Creek, a tributary upstream of McCloud Dam, adversely affects water clarity in the Lower McCloud River by periodically delivering large amounts of fine volcanic sediment from the Konwakiton Glacier on Mt. Shasta directly into McCloud Reservoir (via diversion to Huckleberry Creek). These large, episodic debris flow events pre-date the Proposed Project and are unrelated to proposed operations. Synoptic data collected during non-runoff and non-mass-wasting-event periods indicate that suspended material levels are generally low in all Proposed Project waters. Potential adverse impacts related to suspended material from the Proposed Project will not be significant.

Turbidity

Proposed Project operations and routine reservoir drawdown and maintenance do not adversely affect turbidity in the McCloud River. Periods of reservoir drawdown occurring in 2007 and 2008 were not accompanied by increased turbidity below McCloud Dam. Testing of the lower-level valve at Iron Canyon Reservoir did cause a temporary increase in turbidity in Iron Canyon Creek, but turbidity returned to baseline conditions within one day; therefore, such tests are unlikely to adversely affect beneficial uses. Potential adverse impacts related to turbidity from the Proposed Project will not be significant.

Mitigation Measures: None required.

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Impact: Less Than Significant

For the purposes of this element, a project's impacts to groundwater would be considered substantial, and thus significant, if the project prevented implementation of a groundwater management plan, including by disrupting planned groundwater recharge projects, or if the project would use more than five percent of the annual yield of a groundwater basin and would result in lowering groundwater levels in a manner that renders existing groundwater wells inoperable.

Groundwater contributes approximately 30 percent, or 2.7 million acre-feet (ac-ft), of the total water supply for the Sacramento River region (DWR 2015). The Proposed Project area is located within the Shasta – Pit Planning Area of the Sacramento River Hydrologic Region. Based on 2010 data, the Shasta – Pit Planning Area uses three percent of the total average annual groundwater supply of the Sacramento River Hydrologic Region. Of this amount, 12 percent (11.3 total ac-ft) is used for urban uses (DWR 2015), which includes uses from the McCloud-Pit Project. Currently, the McCloud-Pit Project uses two wells for potable water at Deadlun and Hawkins Campground and other PG&E facilities along the Pit River. The extraction of groundwater would be necessary to provide a water supply for some of the proposed recreational facilities. Up to seven new wells would need to be installed at the following locations:

- > Tarantula Gulch Inlet
- > Tarantula Gulch Boat Launch
- > Star City Campground or its alternate
- > Red Banks Day Use
- > Gap Creek Campground
- > Iron Canyon Dam Boat Launch
- > Fenders Flat Day Use

Similar to the two existing wells, all the new wells would be topped with a handicap accessible hand pump, except for one (at Iron Canyon Dam Boat Launch), as electricity is not available at this location. However, the new wells would be designed and used for seasonal transient uses such as hose bibs for drinking water and rinsing; other facilities such as flush toilets, sinks, and showers would not be provided. Based on water usage estimates from the USFS, camping and day use facilities without flush toilets and showers require approximately six gallons per day (gpd) during the peak of the recreation season, which is generally two months (USFS 2007a). If all the new wells are installed and assuming peak usage occurs for the entire five-month recreation season, the Proposed Project would require approximately 6,300 gallons (or 0.02 ac-ft) annually. This increase in use of groundwater would be less than 0.18 percent of the total groundwater supply used for

potable water in the Shasta – Pit Planning Area. Therefore, the Proposed Project would not substantially deplete groundwater supplies or create significant changes to groundwater recharge. Potential adverse impacts from the Proposed Project on groundwater would not be significant.

Mitigation Measures: None required.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial on- or off-site erosion or siltation;

Impact: Less Than Significant

For the purposes of this element, alteration of existing drainage patterns resulting in erosion or siltation associated with a Proposed Project would be considered substantial, and thus significant, if it would damage any existing structures or violate waste discharge requirements.

The Proposed Project does not propose any changes to the course of any of the rivers or tributary streams within the Proposed Project area relative to existing conditions. However, it is possible that minor off-site erosion or siltation may occur as the result of construction of new recreational facilities. If the Proposed Project results in such an impact, the impact will not be significant because the Proposed Project includes appropriate management of these sites as part of the Erosion and Sediment Control Management Plan and any required Project-specific permits. The Proposed Project includes the addition of recreational facilities slightly increasing the number of impervious surfaces, but this minor change would not affect any existing streams or rivers. Also refer to the discussion under “ii” below.

In addition, increases in instream flow in the Lower McCloud River and Iron Canyon Creek would occur with Proposed Project implementation. The specific changes in instream flows below McCloud Reservoir Dam are described in Chapter 2, Project Description, Tables 2-4 and 2-5. The water flow increases are proposed to improve aquatic habitat conditions. The increases in instream flow would be minor relative to channel-forming flows under existing conditions. For the Lower McCloud River, the average estimates of bed mobility thresholds range from 1,130 cfs to 2,060 cfs (Nevares and Stallman 2009). The maximum instream flows would be 215 cfs at the Ah-Di-Na stream gage (Gage MC-1). Therefore, it is unlikely that the new instream flows would substantially change sediment transport or channel morphology in the Lower McCloud River. No changes to the Pit River flows are proposed or would occur. The impacts of the Proposed Project on altering the existing drainage pattern of the Project area related to on- or off-site erosion or siltation will not be significant.

Mitigation Measures: None required.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

Impact: Less Than Significant

For the purposes of this element, a project would have a significant impact if it increased the amount of surface runoff from project sites in a manner that caused flooding where flooding did not previously occur or that increased existing typical flood levels in a manner that exceeded the capacity of flood management facilities.

The Proposed Project includes the construction of recreational facilities, which would increase the amount of impervious conditions relative to existing conditions. However, if the Proposed Project results in additional surface runoff, the impact will not be significant. The proposed improvements are in relatively remote areas surrounded by undeveloped forested land. No significant areas of connected impervious surfaces would be created. The construction of bathroom facilities (i.e., small structures with impervious roofs), information kiosks, and minor amounts of paving would result in a slight decrease in infiltration of water into the subsurface and an incremental increase in surface water runoff in these Proposed Project areas. However, the changes in infiltration and runoff would be negligible relative to the amounts of infiltration and runoff within the larger Project area and watersheds of the McCloud and Pit Rivers and their tributaries. The increased impervious surface areas would be small relative to surrounding local undeveloped conditions (i.e., forested lands) and would not be expected to cause localized increases in flooding hazards; therefore, the impact would be less than significant.

Mitigation Measures: None required.

iii. 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; or

Impact: No Impact

The existing and proposed facilities within the Proposed Project area are not served by an existing public or private stormwater system. Therefore, any incremental changes to runoff as a result of the Proposed Project would not affect the capacity of such systems. Runoff related to proposed facilities would not provide an additional source of pollution, and would be managed locally (i.e., at and near the facilities) by construction of ditches and culverts and be directed into the natural drainage system (i.e., streams and rivers). The management of runoff would be performed in compliance with the Erosion and Sediment Control Management Plan and any required agency permits, described above. Therefore, the Proposed Project would have no impact to existing stormwater drainage systems.

Mitigation Measures: None required.

iv. Impede or redirect flood flows?

Impact: No Impact

For the purposes of this element, the impact of a project that results in redirection of flood flows would be considered significant if the project resulted in a permanent expansion of the flood plain in a manner that required redrawing of flood hazard maps, or if on a seasonal basis the project would result in the backing up or redirection of flood flows in a manner that damages existing residences or other structures.

Proposed recreational improvements include small structures (e.g., bathroom, boat ramps, information kiosks, etc.), some of which may be located near rivers or streams. However, the structures are small and isolated (i.e., separated by undeveloped land) and rivers and streams in the Proposed Project area are typically steep gradient and highly confined, resulting in a minimal floodplain hazard designation. Therefore, the construction of the recreational improvements would not have the potential to impede or redirect flood flows.

Mitigation Measures: None required.

d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Impact: No Impact

The Proposed Project area is not located in a designated flood hazard, tsunami or seiche zone. Accordingly, the Proposed Project will not have an impact related to the release of pollutants in a flood hazard, tsunami, or seiche zone. Further, rivers and streams in the Proposed Project area are typically steep gradient and highly confined, resulting in a minimal floodplain hazard designation.

Seismic shaking during earthquakes can result in the formation of waves within open bodies of water. The two major types of seismically generated waves are tsunamis and seiches. Tsunamis are waves generated by the displacement of a large volume of water. Therefore, tsunamis only occur in large water bodies such as oceans, bays, or large lakes. Displacement of water can occur by several mechanisms (including subaqueous land-sliding or explosions) but are most commonly caused by submarine displacements of the earth's crust resulting from earthquakes. The McCloud and Iron Canyon Reservoirs are not large enough to allow development of tsunamis.

A seiche is a wave that oscillates in lakes, bays, or gulfs. Seiches range from a few minutes to a few hours as a result of seismic or atmospheric disturbances. Small seiches are almost always present on larger lakes, and the frequency of the oscillation is determined by the size of the water body, its depth and contours, and the water temperature. Larger seiches can be caused by nearby or distant earthquakes and occur when the seismic wave signature is resonant with the natural period of the water body, which is controlled by its shape and depth. If local or more distant earthquakes were to occur, a seiche could occur within the reservoir. The magnitude of a seiche would depend on the amplitude and period of seismic waves affecting the reservoirs. Given the size and natural period of these water bodies

(refer to Chapter 2), it is expected that if a seiche occurred, it would be less than one foot in height. For these reasons, there would be no potential for a release of pollutants resulting from flooding, tsunami, or seiche in the Proposed Project area. No impact would occur.

Mitigation Measures: None required.

e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Impact: Less Than Significant

As discussed under “a” above, PG&E will finalize and implement the Erosion and Sediment Control Management Plan, which requires PG&E to inventory, record, treat, and monitor Proposed Project-related erosion and sedimentation impacts to Project and affected USFS lands and waters. PG&E will implement applicable BMPs during Proposed Project operation and maintenance activities, as well as improvements to or construction of new facilities to minimize the potential for impacts to water quality through erosion and sedimentation or contamination of water from the use fuels or other chemicals. With implementation of the Erosion and Sediment Control Management Plan, including specified BMPs, the Proposed Project will comply with Basin Plan water quality objectives.

As discussed under “b” above, If all the proposed wells are installed and assuming peak usage occurs for the entire five-month recreation season, the Proposed Project would require approximately 6,300 gallons (or 0.02 ac-ft) annually. This minor increase in use of groundwater would be less than 0.18 percent of the total groundwater supply used for potable water in the Shasta-Pit Planning Area. Further, there is no sustainable groundwater management plan applicable to the Proposed Project area. Therefore, the Proposed Project would not conflict or obstruct implementation of a water quality control plan or sustainable groundwater management plan. The impact would not be significant.

Mitigation Measures: None required.

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3.2.11 Land Use and Planning

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Land in the Proposed Project area in private ownership is subject to the Shasta County General Plan (County of Shasta 2004) and zoning ordinance. Shasta County has zoned private land around McCloud Reservoir as Timber Production, around Iron Canyon Reservoir as Timberland and along the Pit River as Timber Production and National Recreation Area, Shasta Unit. For facilities located on non-PG&E-owned private lands, PG&E has established easements or agreements with the landowner to operate and maintain its facilities (Nevaras and Splenda 2008). Federal lands in the Proposed Project area are managed by the STNF pursuant to its Land and Resource Management Plan (USFS 1995). The STNF classifies the forest land around Iron Canyon Reservoir as Late Successional Reserve and Administratively Withdrawn with limited access along the Pit River. The lower reaches of the Pit River are in the Shasta Lake National Recreation Area, managed by the USFS. The rest of the Proposed Project area is in the Shasta McCloud Management Unit of the STNF. The McCloud River Coordinated Resource Management Plan (CRMP) provides for coordinated management of the McCloud River, with a focus on its wild and scenic river eligibility, by federal and state resource agencies, adjacent landowners, and conservation organizations.

Additional descriptions of land use and planning in the Project area are provided in FERC’s final EIS (FERC 2011), Section 3.3.7.1, *Affected Environment*, pages 320 through 327.

Discussion

Additional analyses of environmental impacts on land use and planning can be found in FERC’s final EIS (FERC 2011), Section 3.3.7.2, *Environmental Effects*, pages 330 through 338.

a. Physically divide an established community?

Impact: No Impact

No established communities are located around the McCloud or Iron Canyon Reservoirs or along the Lower McCloud or Pit rivers. None of the proposed recreational facilities would be located in established communities, and other activities as part of the Proposed Project, such as maintenance and implementation of management plans, would not affect established communities. The Proposed Project would have no impact.

Mitigation Measures: None required.

b. Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Impact: No Impact

The designated zones and land allocations for the lands in the Project area are compatible with recreational uses and facilities as well as hydroelectric and transmission facilities, although special use or other permits may be necessary for new or expanded facilities. Proposed Project maintenance activities would not conflict with the Shasta County General Plan or Land and Resource Management Plan, and implementation of management plans would improve land management and possibly reduce existing conflicts with land uses and zoning. Modifications to instream flow in the Lower McCloud River do not conflict with the river's CRMP (USFS 1995). The CRMP is a coordinated effort between landowners and stakeholders with a vested interest in the river. Under the CRMP, the McCloud River would continue to be managed to preserve the pristine quality of its resources, including its free-flowing condition and fishery below McCloud Dam. Implementation and operation of the Proposed Project would not cause an impact due to conflicts with any land use plan or policy. Therefore, the Proposed Project will have no impact on applicable land use policies adopted for the purpose of avoiding or mitigating an environmental effect.

Mitigation Measures: None required.

3.2.12 Mineral Resources

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Mineral resources in the Proposed Project area include precious metals such as gold, although it is not a prevalent resource. The USFS indicates that there are no active mining claims on its lands within the Lower McCloud River Watershed; however, mineral records identify one mine just upstream from the mouth of Squaw Valley Creek on McCloud River Club property (USFS 2011).

With the exception of abundant deposits of high-calcium limestone, the Pit River region in the Project vicinity does not contain significant mineral resources. Limestone, which has a variety of uses from building material to chemical feedstock, is quarried at a few locations on private lands in the region; however, none are located in close proximity to the Proposed Project area.

Discussion

- a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?**

Impact: No Impact

Proposed Project construction does not lie within a Mineral Resource Zone, as identified by the California Geological Survey, Open File Report 97-03 (Dupras 1997), and so the Proposed Project will have no impacts on known and valuable mineral resources.

Mitigation Measures: None required.

b. 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?

Impact: No Impact

PG&E is required to finalize and implement the Final Coarse Sediment Management Plan (see Project Description Section 2.4.6.2). The goal of the Coarse Sediment Management Plan is to provide an adaptive management framework for the collection, storage, and augmentation of coarse sediment into the lower McCloud River below McCloud Dam. This plan requires monitoring of gravel and coarse sediment augmentation that could benefit downstream aquatic habitat in the lower McCloud River, as well as evaluating possible gravel and coarse sediment sources. Implementation of the Coarse Sediment Management Plan would require the excavation of 150 to 600 tons of gravel and coarse sediment. The anticipated source of the gravel and coarse sediment is the Star City Creek delta in McCloud Reservoir.

If practical, the excavation of coarse sediments from the Star City Creek delta would only occur once or twice over the term of the new license. Gravel and coarse sediments would only be excavated from within the dry portion of the Star City Creek delta, once the water line is below the area accessible to ground-based equipment. Implementation of the Coarse Sediment Management Plan would cause a mineral resource (aggregate) to be relocated but would not result in the loss of availability. No other mineral resources have been identified in the Proposed Project area. Therefore, there would be no impact related to the loss of availability of locally-important mineral resource sites.

Mitigation Measures: None required.

3.2.13 Noise

Would the Project result in:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The Proposed Project is in a rural area with limited development. Existing ambient noise levels are relatively low, and noise sources are primarily from environmental factors (e.g., water, wind), existing electrical and hydroelectric facilities, transportation sources (e.g., logging trucks), and recreational activities. Noise levels are noticeably higher near recreation areas during the peak recreation season (late spring to early fall) and along major roadways, particularly those that are used by logging trucks, such as USFS road 38N04Y at the Start City Creek arm of McCloud

Reservoir. Few sensitive receptors, including recreationists and residents, are located in or near the Project area. Per the Shasta County General Plan (2004), acceptable noise levels for non-transportation noise at 100 feet from a residence are 55 decibels (hourly L_{eq} ¹⁹) during daytime hours (7 a.m. to 10 p.m.) and 50 decibels (hourly L_{eq}) during nighttime hours (10 p.m. to 7 a.m.). Construction activities at Proposed Project recreation sites would generate noise above 55 decibels (hourly L_{eq}) during daytime construction; however, the sites are more than 100 feet from existing residences and businesses. Recreationists at the Project reservoirs or along the Pit River may notice construction noise, but the distance between most proposed construction activities and the existing recreation sites, as well as intervening vegetation and topography, would help reduce noise levels and minimize noise exposure. Construction equipment operation associated with implementation of the Proposed Project Coarse Sediment Management Plan and Large Woody Debris Management Plan could generate noise that might disturb recreationists at McCloud Reservoir and along the Lower McCloud River. Maintenance and other activities would generate noise primarily from vehicle travel and minor construction equipment, and some activities could take place near recreation sites or rural residences.

Discussion

- a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?**

Impact: No Impact

Temporary increases in existing noise levels associated with the Proposed Project's construction activities will not generate noise in excess of established standards, because the construction sites are all more than 100 feet from existing residences and businesses.

Similarly, permanent increases in existing noise levels associated with the Proposed Project's expansion of recreational sites will not generate noise in excess of established standards because recreational sites are all located more than 100 feet from existing residences. The Proposed Project will not result in an impact related to established noise standards.

Mitigation Measures: None required.

- b. Generation of excessive groundborne vibration or groundborne noise levels?**

Impact: Less Than Significant

For the purposes of this element, ground-borne vibration or noise would be considered excessive, and thus significant, if it would be felt or heard at residences or businesses for more than four hours per day over one or more consecutive ten-day periods.

Construction activities at recreation sites could result in ground-borne noise or vibrations, but as discussed under item "a" above, the activities would not take place near residences

¹⁹ L_{eq} is the hourly equivalent continuous noise level or the average of all noise measured from 7 a.m. to 10 p.m. (daytime) and 10 p.m. to 7 a.m. (nighttime).

or businesses. None of the other Proposed Project activities are expected to result in ground-borne noise or vibrations. Proposed Project effects related to ground-borne noise or vibration would be less than significant.

Mitigation Measures: None required.

- c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

Impact: No Impact

No private airstrips are located in or near the Project Area. The Proposed Project would have no impact.

Mitigation Measures: None required.

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3.2.14 Population and Housing

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The Proposed Project Area is remote and sparsely populated. Because of environmental conditions (e.g., frequent flooding, topography, inaccessibility), zoning, and land ownership constraints associated with the Project area, there are no permanent residences or populations that would be affected by the Project. The nearest communities to the Project are McCloud (population 1,101 at the 2010 census), which is located approximately eight miles northeast of McCloud Reservoir; and Big Bend (population 102 at the 2010 census), which is located approximately four miles southeast of Iron Canyon Reservoir.

Discussion

- a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?**

Impact: No Impact

None of the Proposed Project activities would induce or encourage population growth in or near the Project area. None of the proposed new or improved recreation facilities are

designed to be permanent living spaces, and the Proposed Project will not convert any non-residential zones to residential zones. The Proposed Project would have no impact.

Mitigation Measures: None required.

b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Impact: No Impact

The Project area is in a rural area with few residences, and none of the Proposed Project activities would result in the displacement of housing. The Proposed Project would have no impact.

Mitigation Measures: None required.

3.2.15 Public Services

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
• Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The USFS provides law enforcement services related to natural and cultural resource protection, as well as fire suppression and prevention activities on National Forest lands within the Proposed Project area. Shasta County Sheriff's Office provides law enforcement, including enforcement of laws related to life and property, and search and rescue services on both private and National Forest lands within the Proposed Project area. The California Highway Patrol – Northern Division also provides law enforcement on unincorporated public roads in the region. Shasta County Fire Department, Cal Fire, and local community fire districts and volunteers provide fire protection services on unincorporated, private lands in Shasta County.

Under existing conditions, the Pit 5 Switching Center operator maintains current law enforcement and emergency service contact information and has standard procedures for contacting law enforcement, fire, rescue, or PG&E personnel in the event of an emergency situation such as fire or flood. This emergency protocol will continue under the Proposed Project.

Discussion

- a. **Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:**

> **Fire protection?**

Impact: No Impact

Development of the Proposed Project recreation sites would potentially increase recreational uses in the Project area and thus increase the demand on fire protection service providers, but due to the limited size and scope of the expanded recreation sites an increase in recreational use associated with the Proposed Project will not require the provision of new or physically altered fire protection facilities.

In addition, the Fire and Fuels Management Plan and the Sign and Interpretive/Education Management Plan components of the Proposed Project would: (a) identify field sites for appropriate posting of fire danger and safety posters, hazard, or other related sign information; and (b) develop public fire awareness signs, messages, and brochures to educate the public about fire danger and safety and help recreational uses avoid creating fire risks. The Project Patrol Plan would identify areas of high fire risk that will require more frequent monitoring, but this monitoring would be carried out by PG&E and not by local fire protection services. The Proposed Project would not have an impact related to new or altered fire protection facilities. (Additional discussion of wildfire-related impacts is provided in Section 3.2.20.)

Mitigation Measures: None required.

> **Police protection?**

Impact: No Impact

Development of the Proposed Project recreation sites would increase the demand on local emergency service providers, including police protection, but such an increase is expected to be minimal based on the anticipated visitation to the area. Similar to existing conditions, emergency calls would be anticipated to increase during the peak recreation season (i.e., between late spring and early fall). Existing service providers would be able to meet the needs of the recreationists without the need for

new or physically altered governmental facilities. The Proposed Project would not have an impact related to new or altered police facilities.

Mitigation Measures: None required.

> **Schools?**

Impact: No Impact

The Proposed Project would not generate an increase in population that would affect schools. Therefore, no impact to schools would occur.

Mitigation Measures: None required.

> **Parks?**

Impact: No Impact

The Proposed Project would not generate an increase in population that would affect parks. Therefore, no impact to parks would occur. Refer to Section 3.2.15, Recreation, for information related to provisions for recreational resources.

Mitigation Measures: None required.

> **Other public facilities?**

Impact: No Impact

The Proposed Project would not generate an increase in population that would affect any other public facilities. Therefore, no impact to public facilities would occur.

Mitigation Measures: None required.

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3.2.16 Recreation

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

FERC requires licensees to construct, maintain, and operate recreational facilities to meet Project recreation demands. In addition to facilities, licensee-owned lands within the FERC boundary for hydropower projects are open to the public for recreational activities, with the exception of lands or areas restricted for safety or security reasons (e.g., designated for hydropower operations).

The Proposed Project provides recreational opportunities at developed sites on McCloud Reservoir, Iron Canyon Reservoir, and Pit 7 Afterbay. There are also developed sites on the Lower McCloud River including Ah-Di-Na Campground, Ah-Di-Na Interpretive trails, Ash Camp Campground, and Ash Camp Trailhead. However, the facilities on the Lower McCloud River are operated by the USFS and are not part of the Proposed Project. The Proposed Project provides dispersed recreation opportunities on USFS lands and PG&E-owned lands adjacent to developed facilities on McCloud Reservoir, Iron Canyon Reservoir, James B. Black Powerhouse, Pit 6 and Pit 7 Reservoirs, and Pit 7 Afterbay/Fenders Flat. Tables 3-6 and 3-7 display the existing recreation resources in the Project area. Additional descriptions of recreation in the Project area are provided in FERC’s final EIS (FERC 2011), Section 3.3.5, *Recreation Resources*, pages 228 through 246.

Table 3-6 Developed Recreation Sites Inventoried in 2007

Recreation Resource Center	Developed Recreation Study Site
McCloud Reservoir	<ul style="list-style-type: none"> • Tarantula Gulch Boat Launch (also known as the Lake McCloud Boat Launch)¹
Iron Canyon Reservoir	<ul style="list-style-type: none"> • Deadlun Campground¹ • Hawkins Landing Campground • Hawkins Landing Boat Launch
Pit 7 Afterbay	<ul style="list-style-type: none"> • Fenders Flat Boat Launch^{1,2}
Lower McCloud River	<ul style="list-style-type: none"> • Ah-Di-Na Campground • Ah-Di-Na Interpretive trails and signs • Ash Camp Campground • Ash Camp Trailhead
All access roads leading to Project reservoirs and developed recreation facilities	<ul style="list-style-type: none"> • All signs providing directions to or information about each of the reservoirs and developed recreation facilities listed above. Recreation sites that were inventoried are on roads from the main county access roads to the reservoirs and developed recreation facilities.

Notes:

- ¹ Current USFS facilities to be rebuilt and incorporated as Project-managed facilities.
- ² This site does not have any developed amenities and was considered a dispersed recreation site and assessed under Task 2 of the Study Description (Nevares, Splenda, and Littlejohn 2008).
- ³ These facilities on the Lower McCloud River are not part of the Existing Project.

Table 3-7 Dispersed Recreation Sites Inventoried in 2007

Recreation Resource Area	Associated Developed Recreation Facility or Area with Dispersed Recreation Activity
McCloud Reservoir	<ul style="list-style-type: none"> • Area between the waterline and access road encircling McCloud Reservoir (excluding privately owned land) between and including Tarantula Gulch and Star City • Island in reservoir • Hawkins Tunnel Site
Iron Canyon Reservoir	<ul style="list-style-type: none"> • Deadlun Campground • Hawkins Landing Campground • Hawkins Landing Boat Launch • Area between the waterline and access road encircling Iron Canyon Reservoir (excluding privately owned land) • Iron Canyon Creek (user-created access occurring on public land)
James B. Black Powerhouse	<ul style="list-style-type: none"> • Across from powerhouse and downstream of the bridge
Pit 6 Reservoir	<ul style="list-style-type: none"> • Along Pit 6 Powerhouse Road as it enters the canyon • Parking areas, user-created trails, and shoreline near the Pit 7 Dam
Pit 7 Reservoir and Afterbay	<ul style="list-style-type: none"> • Fenders Flat Area (includes unimproved boat launch and adjacent flat area) • Pit 7 Powerhouse Road between Fenders Ferry turnoff and Pit 7 • Powerhouse (including fence) • Parking areas, user created trails, and shoreline near the Pit 7 Dam
Lower McCloud River	<ul style="list-style-type: none"> • Ah-Di-Na Campground • Ash Camp Campground and Pacific Crest Trail trailhead • Between Forest Road 38N53 and Lower McCloud River shoreline from about T38N R2W Section 33 near the Pacific Crest Trail crossing to the end of the road near the Nature Conservancy's McCloud River Preserve

Under the Proposed Project the following recreation enhancements would occur:

McCloud Reservoir

- > Tarantula Gulch Boat Launch expansion and parking lot upgrades
- > McCloud Day Use Area improvements
- > Red Banks Day Use Area improvements
- > Battle Creek Day-Use and Angler Access Area circulation improvements
- > McCloud Reservoir West Dam Angler Access Area improvements
- > McCloud Reservoir East Dam Access improvements
- > Star City Campground and Day Use Area new development
- > McCloud Dam Improved River Access

Iron Canyon Reservoir

- > Hawkins Landing Boat Launch Ramp replacement and parking lot construction
- > Hawkins Landing Campground reconstruction
- > Deadlun Campground expansion and upgrades
- > Gap Creek Campground new construction
- > Iron Canyon Dam Boat Launch and Parking Lot new construction
- > Three New Day Use Areas at Iron Canyon Reservoir
- > Pit 6 Boat Access

Pit 7 Reservoir

- > Upper Pit 7 Reservoir Trailheads, Trail and Boat Launch improvements
- > Lower Pit 7 Reservoir Day Use Area improvements

Pit 7 Afterbay

- > Fenders Flat Day Use Area New Construction

Additional details on each of these recreation enhancements can be found in Section 2.4, Proposed Recreation Facilities of this document. In addition to these enhancements, instream flow requirements would be changed such that whitewater boating opportunities on the Lower McCloud River would be improved.

Discussion

Additional analyses of environmental impacts on recreation can be found in FERC's final EIS (FERC 2011), Section 3.3.5.2, *Environmental Effects*, pages 246 through 289.

a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Impact: Less Than Significant

For the purposes of this element, a project would be considered to have a significant impact if it resulted in the permanent increased use of existing recreational facilities beyond the planned capacity of such facilities, for example by displacing recreational users from an existing recreational facility or adding residences in the vicinity of an existing recreational facility. Impacts to recreation resources are considered for: (a) overall recreation use; (b) angling on the Lower McCloud River; and (c) whitewater boating on the Lower McCloud River.

Impacts to Overall Recreation Use

Each of the above recreation enhancements would require several days to two months of construction for completion. For purposes of this analysis it is assumed that not all enhancements would be completed concurrently because PG&E plans staged construction due to personnel and equipment restraints. Staff-recommended license conditions in the FERC final EIS (FERC 2011) indicate construction will occur within three years following issuance of the new license. During the three-year construction period, some existing recreation facilities being improved and areas where new facilities are being built would be closed to public use, potentially resulting in short-term recreation use impacts. Visitors desiring to use these facilities might use other recreation resources within the Project area, or the region. A common type of impact during boat launch ramp construction is a loss of access to the reservoir for recreationists launching motorized boats. At McCloud Reservoir, Tarantula Boat Launch is the only boat launch on the reservoir. During reconstruction, the boat launch would be closed during the two-month construction period. This would result in a temporary decline in motorized boating use on the reservoir, and displaced recreational users might choose to visit other recreational sites in the area as a substitute. However, construction of the boat launch would occur late in the year after the prime recreation season, and when the McCloud Reservoir is at its lowest water level. At Iron Canyon Reservoir, there is an existing boat launch that will be reconstructed and a proposed new boat launch. To maintain boating access to the reservoir during construction at these two facilities, construction of the proposed boat launch will be completed and opened to the public before reconstruction of the existing boat launch.

Based on USFS visitation estimates, the STNF receives approximately 1.5 million recreation visitors per year (USFS 2013). The Proposed Project area lies within the remote, rugged, and densely forested McCloud River and Pit River canyons. Public recreation facilities such as campgrounds within the Proposed Project area are primitive, typically providing only vault toilets and no electrical, potable water, or other public utility connections. As a result, recreation use levels within the Project area are relatively low (approximately

33,000 recreation visitors per year). The temporary shift in motorized boating use and general recreational use patterns would most likely not result in a significant reduction in recreation use. The STNF offers a full range of recreational resources at Mt. Shasta, Shasta Lake, Trinity Lake, Big Bar, Hayfork and Platina areas, in addition to the McCloud area. Over 90 campgrounds and day use areas and over 20 points of interest (e.g., boat ramps, wilderness areas, etc.) are available within the STNF (USFS 2018). The number of visitors displaced during construction of recreation facilities at any one time would be a small proportion of total annual use, and there is substantial opportunity and capacity at other recreation resources within the area to accommodate additional use resulting from temporary closures of Project facilities on a temporary basis. Once improvements and new recreation facilities are completed, recreation use in the Project area may subsequently increase.

Angling on the Lower McCloud River

Angling was the most documented use during the recreation survey conducted as part of the Proposed Project relicensing studies. Moreover, the Lower McCloud River is considered a “blue ribbon” trout fishery, offering excellent opportunities to fish in an undeveloped setting that receives low angling pressure. Angling use of the Lower McCloud River is affected by water releases from McCloud Dam. A relicensing study assessed Lower McCloud River flows for angling and determined that flows of 210-375 cfs are optimal for anglers and flows of 200-475 cfs are acceptable for anglers (Nevares, Whittaker, and Shelby 2009). “Optimal” and “acceptable” angling conditions were self-defined by the anglers who participated in the study.

PG&E analyzed the McCloud River hydrograph, below McCloud Dam, for a 33-year period (1974 to 2006) and calculated the number of optimal and acceptable angling days that would occur each year under: (a) the existing instream flow requirements; and (b) the final USFS 4(e) flow requirements (i.e., the new MIFs under the Proposed Project). Table 3-8 shows the change in the number of days for angling and whitewater boating on the Lower McCloud River between the current MIFs and the new MIFs under the Proposed Project. Under the Proposed Project new MIFs, anglers would lose a total of 143 optimal and acceptable angling days when compared to the existing MIFs over the period of record (1974 to 2006), or an average loss of about four optimal and acceptable angling days each year. Given the number of lost angling days is a small portion of the total angling days available in each water year type (approximately two percent), there is a very low likelihood that anglers would be displaced to other regional fishing areas. Once improvements and new recreation facilities are completed, angling use may subsequently increase.

Table 3-8 Changes in Boating and Angler Days¹ under the Proposed Project

Flows under the Proposed Project	Boating (300-1,500 cfs at Ah-Di-Na)		Angling (<301 cfs at Ah-Di-Na)	
	Difference From Current MIFs	Total Days Available with new MIFs	Difference From Current MIFs	Total Days Available with new MIFs
	Total Days in the Period of Record for April Through November			
Final 4(e) Condition (November 2010)	+500	1,224	-143	6,010

Source: PG&E 2009, Exhibit B.

Notes:

¹ Number of days is based on hydrographic data for the period of record from 1974 through 2006.

Whitewater Boating on the Lower McCloud River

Whitewater boating occurs on the Lower McCloud River. Use levels recorded during relicensing studies were low (less than five percent of total recreation activities), which is primarily due to limited access to the Lower McCloud River (Nevares, Whittaker, and Shelby 2009). Starting below McCloud Dam is a technically advanced 3.5 RM-long boating run ending at Ah-Di-Na Campground. From the campground, there is an easier 20.5 RM-long boating run ending at Shasta Lake. The whitewater boating relicensing study identified a wide range of acceptable boating flows from 180 cfs as the minimum for “Access Based Boating”, to 1,500 to 3,000 cfs for “Big Water Boating”. When boaters were asked to specify a single flow that should be provided if there was a dedicated boating releases from McCloud Dam, the median response was 800 cfs. As shown in Table 3-8, under the Proposed Project MIFs boaters would gain 500 days, compared to the current MIFs over the 33-year of record (1974 to 2006); or an approximate gain of 15 days per year, with flows in the 300 to 1,500 cfs flow range. Flows in the Lower McCloud under the Proposed Project would be beneficial for whitewater boaters since there would be an increase in the number of boating days per year. Once improvements and new recreation facilities are completed, whitewater boating use may subsequently increase.

Recreation and Development Management Plan

The Recreation Development and Management Plan describes the specific tasks, components, and products that will guide the management of recreation resources and

opportunities associated with the Proposed Project. Minimum components include, but may not be limited to:

- > Operation and Maintenance: Development and implementation of an Operation and Maintenance component (including fee collection and retention) for all Project recreation facilities.
- > Recreation Survey and Monitoring: Development and implementation of a periodic Recreation Survey and Monitoring component with a Report that is filed with FERC after USFS approval.
- > Project Patrol: Development and implementation of a Project Patrol Plan for Project and Project-affected NFS lands.
- > Reservoir Water Surface Management: Development and implementation of a Reservoir Water Surface Management component that addresses recreation user safety (including surface debris capture), discourages travel onto adjacent private lands, and displays County code and contact information to Project users on each Reservoir surface (McCloud, Iron Canyon, Pit 6 and Pit 7).
- > Recreational Facility Construction: Construction and reconstruction of several recreational facilities near McCloud Reservoir, McCloud River below McCloud Dam, Iron Canyon Reservoir, Pit 6 Reservoir, and Pit 7 Reservoir and Afterbay (described in more detail in Section 2.4.3).

PG&E would be required to provide reservoir water level information to the public so that visitors would be informed when conditions are suitable for launching boats on McCloud and Iron Canyon Reservoirs. PG&E would also be required to provide real-time water flow information on the internet (gauge MC-1 at Ah-Di-Na) for the McCloud River below McCloud Dam to inform the public when water flows are safe for angling, or suitable for whitewater boating.

Boaters could also reference the publicly available MC-1 Gage information to target acceptable flows to optimize their use of the resource. In addition, the proposed McCloud Dam Improved River Access will include a whitewater boating put-in to improve access to the Lower McCloud River.

With implementation of the Recreation Development and Management Plan, potential impacts resulting from potential increases of use of new and improved recreational facilities would not be significant.

Mitigation Measures: None required.

b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

Impact: Less Than Significant

For the purposes of this element, a project would be considered to have a significant impact if it involved the construction or operation of recreational facilities, and the analysis shows that the construction or operation would themselves cause significant environmental impacts.

The Proposed Project would implement numerous recreation enhancement activities. Many of these actions would involve ground disturbing activities, and some are in close proximity to reservoirs or rivers. There would be short-term construction-related impacts, but these impacts would be minimized with implementation of PG&E's Environmental Management and Monitoring Plans, as discussed throughout Chapter 3 of this document. The recreational facilities that will be constructed or renovated under the Proposed Project are consistent with the rural character and existing recreational uses (e.g., camping, fishing, and boating) of the Project area.

Recreational enhancements could have potential adverse effects over the long-term (following construction). For example, construction of boat launch ramps at Tarantula Gulch, Hawkins Landing, and Iron Canyon Dam and improving shoreline access Battle Creek Day Use Area, at McCloud Dam, and at Star City Campground could potentially result in shoreline erosion and impacts to shoreline vegetation, and expanded recreational sites could result in increased vehicle traffic.

However, recreation-related impacts of the Proposed Project will not be significant because vehicle traffic at the recreational sites would be limited to the access road, boat launch ramp, and parking areas. Additionally, the recreation enhancements are planned to limit uncontrolled vehicle access to the McCloud and Iron Canyon Reservoir shorelines. Several of the recreation enhancements are planned for areas currently being used for dispersed recreation that is causing adverse environmental impacts from uncontrolled vehicle access, vegetation removal, and sanitation issues. The proposed recreation enhancements would limit vehicle access to established roads and parking areas, include vault toilets, and provide appropriate day use and camping facilities. As discussed above, potentially significant impacts would be reduced to less than significant with the implementation of the Recreation and Development Management Plan as part of the Proposed Project. In addition, implementation of Proposed Project components including the Vegetation and Invasive Weed Management Plan, Terrestrial Biological Management Plan, Recreation and Development Management Plan, Historic Properties Management Plan, and Erosion and Sediment Control Management Plan would ensure that recreation-related impacts of the Proposed Project remain less than significant.

Mitigation Measures: None required.

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3.2.17 Transportation

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

Roads in the Proposed Project area are primarily USFS roads with some private roads; most roads are narrow and winding. The majority of the roads have unpaved surfaces (Nevares and Splenda 2009a,b). State Route 299 provides access to the southern portion of the Project area from the city of Redding, and State Route 89 provides access to the northern portion from McCloud, Dunsmuir, and Mt. Shasta. Routine road maintenance activities associated with the Proposed Project would include removing overgrowing vegetation, plowing snow in the winter, and re-paving or re-grading poor condition roads. Roads in the network are individually or cooperatively maintained by USFS, Shasta County, private landowners (e.g., The Hearst Corporation, Southern Pacific Industries), and PG&E.

Shasta County's General Plan (Shasta County Planning Division 2004) includes a Circulation Element that addresses the movement of people and goods in Shasta County. The Circulation Element relies in part on the County's Regional Transportation Plan (RTP), which serves as a guide for interjurisdictional circulation planning within the County and considers and

incorporates, as appropriate, the transportation plans of the California Department of Transportation and local municipalities. The RTP's goal is to "encourage and promote the safe and efficient management, operation and development of a regional intermodal transportation system that, when linked with appropriate land use planning, will serve the mobility needs of goods and people" (California Transportation Commission 2017).

The Circulation Element notes that the circulation system is dominated by the automobile, and that there is currently little incentive to explore alternatives due to low density land uses in the County. It states that the "most important features" of the circulation system in Shasta County are "(1) its extensive provisions for automobile travel, and (2) the location of a major multimodal (auto, truck, bus, rail, air, and pipe and transmission line) transportation corridor through the SCR [South Central Region] area"²⁰ (Shasta County Planning Division 2004). The Circulation Element includes County Circulation and Bikeway maps, and lists the County's objectives and policies for its overall circulation system. The maps provided depict the locations of McCloud and Iron Canyon Reservoirs. Regarding pedestrian traffic, the Circulation Element includes an objective to "recognize pedestrian... circulation as functional alternative to the automobile in urban and suburban areas."

In regard to the coarse sediment augmentation, PG&E would not extract all 16,200 tons of gravel at Star City Creek delta at one time, but rather would extract a maximum of approximately 600 tons of material per year. To transfer 600 tons of gravel from Star City Creek delta to the tunnel crossing at Hawkins Creek (a proposed storage area), would require a maximum of approximately 23 round trips, using typical transfer trucks that haul at most 26 tons per load. Approximately 30 days would be required to stockpile material at the Hawkins Creek Tunnel Crossing, which includes time spent excavating, screening, and hauling gravel.

Discussion

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

Impact: No Impact.

The Circulation Element of the County's General Plan shows that there are no bikeways in the Proposed Project area, and only one road within the Proposed Project area, Fender's Ferry Road, is delineated on the County circulation map. There are no public transit corridors or stations in the Proposed Project area, and as the Proposed Project is in a rural area rather than an urban or suburban area, it cannot conflict with the County's objective for pedestrian traffic. No part of the Proposed Project is located in the County's South Central Region. The Circulation Element does not establish any plans or policies specific to Fender's Ferry Road. There are no other programs, plans, ordinances, or policies that could conflict with the Proposed Project in the Proposed Project area, and so the Proposed Project will have no impact.

²⁰ The South Central Region identified by the County's General Plan includes the Cities of Shasta Lake, Redding, and Anderson. It does not include any portion of the County lying north or east of Lake Shasta.

In addition, as part of the Proposed Project, PG&E would implement a Road and Transportation Facility Management Plan. The Road and Transportation Facility Management Plan describes the scope of road maintenance, improvements, and monitoring needed to meet new license conditions, and USFS road management objectives (RMOs) and traffic service levels applicable to Proposed Project roads. The objectives are to:

- > Develop and describe the protocols to periodically inventory Proposed Project roads, identify road repair and reconstruction needs, and schedule priority work;
- > Develop and implement operation and maintenance standards including annual reconnaissance, inspection frequencies, surface treatment and replacement, road drainage, erosion control, invasive species control, cultural resource protections, LOP restrictions, and safety measures;
- > Identify and track all traffic-related signs, including design and placement, and periodic inspection, repair, and replacement over the license term;
- > Develop and implement protocols to monitor and document road use and road capacity over the license term using traffic survey measurements (mechanical and visual) against established RMOs; and
- > Describe the protocols to use borrow sites, water drafting sites, and disposal sites including the materials to be disposed and the process to establish new sites, if needed.

Although short-term and long-term increases in traffic may be expected as a result of Proposed Project activities (see item “b” below), the circulation system would be maintained and improved to accommodate the traffic.

Roads in the Proposed Project area do not provide alternative modes of transportation for the public, and no designated mass transit or bicycle routes are located along the roads. Trails would be improved in the Project area, which would result in increased pedestrian and boat access to water bodies in the Project area and recreational facilities, benefitting the public.

The Proposed Project would not result in an impact due to any conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Mitigation Measures: None required.

b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Impact: Less Than Significant

The Proposed Project does not propose uses that would substantially increase vehicle miles traveled (VMT) in the area. Operation and maintenance of the Proposed Project would be similar to existing conditions, resulting in minimal additional VMT. Improved recreation areas may slightly increase the number of visitors in the area; however, this is not expected to be substantial.

During construction of the recreation improvements, the Proposed Project would generate VMT consisting of a few daily vehicles for workers and large trucks to transport heavy equipment at the beginning and end of construction. However, construction-related VMT would be short-term and not substantial. Therefore, the Proposed Project would not have a significant impact on VMT and would not result in conflicts or inconsistencies with CEQA Guidelines section 15064.3.

Mitigation Measures: None required.

c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Impact: Less Than Significant

The Proposed Project does not include the construction or development of any transportation facilities with geometric design features. However, some of the existing roads in the Proposed Project area are winding and steep and pose hazards to travelers. Large trucks and construction equipment using these roads may pose a hazard to recreational and other travelers and could contribute to increased numbers of accidents. Truck and equipment trips would be minimal and short-term during the construction periods for Proposed Project activities, but the temporary increase in traffic on some roads in the Project area could still contribute to significant impacts on public safety.

However, the potential impact of the Proposed Project will not be significant because it includes implementation of the Road and Transportation Facility Management Plan that includes measures to provide signs, properly notify travelers of activities, and establish routes for truck and equipment traffic would help minimize potential traffic hazards and reduce impacts.

As part of the Proposed Project, PG&E would implement the Road and Transportation Facility Management Plan. The Road and Transportation Facility Management Plan describes the scope of road maintenance, improvements, and monitoring needed to meet new license conditions, and USFS RMOs and traffic service levels applicable to Proposed Project roads. With implementation of the measures contained within the Road and Transportation Facility Management Plan impacts related to increased hazards would not be significant.

Mitigation Measures: None required.

d. Result in inadequate emergency access?

Impact: Less Than Significant

Long-term operation and maintenance of the Proposed Project would include the addition of up to five seasonal caretakers to operate and maintain existing recreational facilities generally from mid-May through mid-September. All other operation and maintenance associated with the Proposed Project (i.e., worker trips) would be similar to existing conditions. Following recreation facility improvements, there is the potential to see an

increase in visitor use; however, this is not anticipated to be substantial. Traffic associated with long-term operation and maintenance of the Project (including operation of the recreational facilities) will not be sufficiently dense to impede emergency access. In addition, the Proposed Project includes implementation of the Road and Transportation Facility Management Plan which includes periodic traffic use surveys and road capacity reviews, and actions to be taken in the event of deficiencies.

On a short-term basis, construction traffic associated with the Proposed Project could result in temporary delays of emergency traffic during the construction period, particularly during peak recreation periods when traffic is higher and during road improvements. While short delays may be incurred during construction activities, roads will remain open and PG&E will maintain emergency access routes to ensure that emergency vehicles can travel through or around the work areas when needed. Further, the Road and Transportation Facility Management Plan includes an annual road operation and maintenance schedule so that land management and emergency responders are notified of construction activities prior to implementation.

Therefore, long-term and short-term impacts associated emergency access will not be significant.

Mitigation Measures: None required.

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3.2.18 Tribal Cultural Resources

Are significance criteria established by the applicable air district available to rely on for significance determinations? Yes No

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

Refer to Section 3.2.5, Cultural Resources.

Discussion

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?**

Impact: Less Than Significant

Studies to identify TCPs were conducted with the assistance of the Pit River Tribe and the Winnemem Wintu Tribe to identify culturally sensitive areas within the Project area (Navares and MacDougall 2009). Archaeological and historical investigations for the Proposed Project identified 33 isolated artifacts or features and 30 sites (including 28 prehistoric sites, one historic site, and three prehistoric/historic sites) within the APE (FERC 2011). Similar to the analysis set forth Section 3.2.5, impacts would be significant if a project altered tribal resources in a manner that prevented identification or study of the resource or, in the case of human remains, prevented recovery or reburial of the remains. In addition, for the purposes of this analysis, impacts to tribal cultural resources would be considered significant if they destroyed the value the resource has for an identified California Native American tribe.

The Historic Properties Management Plan required in USFS Final 4(e) condition number 34 outlines continued adherence to federal and state laws and regulations, regular communication with other agencies, the Pit River Tribe, and the Winnemem Wintu Tribe regarding the management of historic properties within the Proposed Project's APE. The Historic Properties Management Plan also specifies general treatment measures for: operations and maintenance (including road maintenance); the management of ethnobotanical resources; avoidance, monitoring, stabilization, data recovery, curation, and other treatment measures pertaining to historic properties; and accidental discovery of archaeological sites or human remains. The use of qualified Tribal Cultural Monitors is required during archaeological surveys, site testing, and data recovery, non-emergency construction, and maintenance activities requiring ground disturbance that would create a reasonable effect to historic properties, and during long-term historic properties monitoring. With implementation of this component of the Proposed Project, impacts to tribal historical resources would not be significant.

Mitigation Measures: None required.

- b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**

Impact: Less Than Significant

Studies to identify TCPs were conducted with the assistance of the Pit River Tribe and the Winnemem Wintu Tribe to identify culturally sensitive areas within the Project area (Nevaras and MacDougall 2009). The studies identified 31 TCP locations, several of which are culturally sensitive to the Pit River Tribe. Consultation with the California SHPO and FERC has determined that four of these locations are eligible for listing on the National Register, 18 are ineligible for listing, and nine remain unevaluated (FERC 2011). Based on the results of this consultation, any locations found eligible for the National Register are considered significant for the CRHR under the criteria set forth in subdivision (c) of the Public Resources Code section 5024.1. Of the remaining 27 locations that have not been evaluated for specific inclusion on the CRHR, 18 of which were found ineligible for the National Register and thus are not deemed significant resources for the purposes of this analysis, and the State Water Board has not concluded that substantial evidence supports the designation of the remaining nine locations as significant resources for the purposes of this analysis. Per the discussion under “a” above, the use of qualified Tribal Cultural Monitors is required during archaeological surveys, site testing, and data recovery, non-emergency construction, and maintenance activities requiring ground disturbance that would create a reasonable effect to historic properties, and during long-term historic properties monitoring.

Although the State Water Board has determined that there are resources that are significant under the criteria of Public Resources Code section 5024.1, subd. (c), with implementation of the Historic Properties Management Plan potential impacts to tribal historical resources would be less than significant, as the Project would not cause a substantial adverse change in the significance of eligible and/or unevaluated tribal cultural resources.

Mitigation Measures: None required.

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3.2.19 Utilities and Service Systems

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

The Proposed Project area is remote and sparsely populated. Although PG&E infrastructure is present, public recreation facilities such as campgrounds within the Proposed Project area are primitive, typically providing only vault toilets and no electrical, potable water, or other public utility connections. Cellular telephone reception is sporadic at best, mainly due to the extreme topography of the area. In most parts of the Proposed Project area, litter removal is the responsibility of the person that generates it; however, in developed USFS facilities such as the campgrounds and picnic areas at Iron Canyon Reservoir and McCloud Reservoir, trash receptacles are maintained by the USFS or a maintenance contractor. Duties of the Project Patrol include picking-up litter and emptying trash cans on Project lands and Project-affected lands.

In accordance with the California Integrated Waste Management Act of 1989 (IWM Act), Shasta County maintains an Integrated Waste Management Plan (IWMP). Under the IWM Act, every city and county in California was required to reduce the volume of waste sent to landfills by 50 percent by 2000 and assure maintenance of at least a 15-year landfill capacity for solid wastes that are generated in the county and cannot be reduced or recycled. In addition, Shasta County adopted a Source Reduction and Recycling Element in 1991, which addresses the County’s waste generation characteristics, source reduction, recycling, composting, education and public information, funding, and integration of solid waste management issues.

Discussion

- a. **Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects??**

Impact: Less Than Significant

For the purposes of this element, a project's impacts would be considered significant if the project involved the relocation or construction of utility facilities and the analysis showed that construction or relocation would themselves result in significant environmental impacts.

Some of the Proposed Project activities would involve the installation or replacement of culverts along trails or roads to maintain flow in drainages that cross trails or roads. Up to ten of the recreational developments would require installation of sealed vault tanks to hold sewage. Up to seven new groundwater wells may be drilled to serve recreational sites. Implementation of these Project components raises the possibility of significant environmental impacts related to construction or installation. The Proposed Project does not involve the relocation or construction of any new or existing other water, wastewater treatment or stormwater, electric power, natural gas, or telecommunication facilities.

Moreover, impacts associated with utilities work that will be conducted under the Proposed Project will not be significant because they consist primarily of temporary construction-related disturbances, and as part of Project implementation PG&E is required to prepare and implement a SWPPP pursuant to the requirements of the Construction General Permit.

Under the SWPPP requirements, which are regulated by the CVRWQCB, the Proposed Project will include implementation of BMPs for the control of erosion and sedimentation. Additionally, the provisions of the proposed Erosion and Sediment Monitoring and Control Plan and the Road and Transportation Facility Management Plan would require appropriate controls on erosion during operation and maintenance. All conditions and requirements of the permits will be included with construction specifications and implemented as part of the Proposed Project. Vault toilets would be maintained by periodic pumping, and the sewage would be transported to an approved wastewater treatment facility. For conclusions regarding the Proposed Project's potential operational impacts on groundwater, see Section 3.2.10. The Proposed Project's impacts will not have a significant impact related to relocation or construction of new or existing utility facilities.

Mitigation Measures: None required.

b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Impact: Less Than Significant

For the purposes of this element, a project would be considered to have a significant impact if it, during normal, dry, or multiple dry years, it would be forced to obtain water from sources not covered by the project proposal for project operations or maintenance.

Currently, the McCloud-Pit Project uses two wells for potable water at Deadlun and Hawkins Campground and other PG&E facilities along the Pit River. The extraction of groundwater would be necessary to provide a water supply for some of the proposed recreational facilities (up to seven new wells). In addition, during construction, water would temporarily be used for dust control. Sources of water for these uses would primarily be groundwater but could also include existing PG&E and USFS entitlements, or the Proposed Project reservoirs once the FERC license is renewed, via a Special Use Permit from the USFS.

Based on water usage estimates from the USFS, camping and day use facilities without flush toilets and showers require approximately six gpd during the peak of the recreation season, which is generally two months (USFS 2007a). If all the new wells are installed and assuming peak usage occurs for the entire five-month recreation season, the Proposed Project would require approximately 6,300 gallons (or 0.02 ac-ft) annually. This increase in use of groundwater would be less than 0.18 percent of the total groundwater supply used for potable water in the Shasta-Pit Planning Area. (For additional analysis regarding the Proposed Project's water use, see Section 3.2.10.)

During dry and multiple dry years, the Project still has substantial groundwater flow. It takes several years of significantly below average precipitation (i.e., drought conditions) to substantially deplete the summer base flow (email communication Alan Soneda, April 10, 2019). Due to the remote location and nature of the Project, in the event of severe drought conditions, PG&E and the USFS would consult regarding options to restrict usage and/or implement other conservation measures.

The Proposed Project has sufficient water supplies available to serve the existing and proposed facilities and impacts to water supply would be less than significant.

Mitigation Measures: None required.

c. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?

Impact: Less Than Significant

Sanitary waste disposal needs for the proposed facilities will be served by vault toilets, which would be periodically pumped, and the sewage transported to an appropriate wastewater treatment facility. The Proposed Project includes construction of new vault toilets; however, the increase in sewage from these toilets would be minimal. Additionally, portable restroom facilities would be used by workers during the construction phase of the Proposed Project.

Therefore, the Proposed Project will not have a significant impact on the wastewater treatment facility's capacity to serve the Proposed Project or existing commitments.

Mitigation Measures: None required.

d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Impact: Less Than Significant

The Anderson Landfill is the nearest landfill to the Project area and currently receives waste from Existing Project facilities and other developments that generate waste in the Project area. The landfill has a permitted capacity of 1,850 tons per day and 16.84 million cubic yards total (California Department of Resources Recycling and Recovery 2018). The landfill had about 10.5 million cubic yards of available capacity as of April 2018. The recreation facilities would annually produce approximately 450 cubic yards of waste (a fraction of a percent of the landfill's annual capacity), which would be hauled away by the local waste disposal company, such as Burney Disposal, Inc., and disposed at the Anderson Landfill. In addition, construction activities would also produce a quantity of solid and possibly hazardous waste, estimated at 750 cubic yards. Ongoing operations and maintenance activities will produce approximately 14 cubic yards of waste annually. Over the 50-year life of the new FERC license, the waste from the Proposed Project will total approximately 23,950 cubic yards, or about 0.002 percent of the total landfill capacity that was available as of April 2018.

The Proposed Project would not generate solid waste in excess of state or local standards, exceed the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals contained in the Shasta County IWMP. Therefore, the Proposed Project will not result in a significant impact related to solid waste disposal.

Mitigation Measures: None required.

e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Impact: Less Than Significant

During construction of the recreation facility improvements, usable excess construction materials such as lumber, paint, metal pipe, etc. would be returned to the PG&E Service Center and reused for other projects. Waste would be disposed of at local waste transfer stations, such as the Anderson Solid Waste Landfill. The estimated volume of waste generated by construction would be 750 cubic yards.

All Proposed Project activities would comply with applicable solid waste disposal laws and policies, and PG&E would recycle waste when possible. Any hazardous waste generated by Proposed Project activities would be properly disposed of at a facility that can accept the

waste as required by HMBPs (refer to Section 3.2.8). Impacts related to solid waste regulations would not be significant.

Mitigation Measures: None required.

3.2.20 Wildfire

Is the project located in or near state responsibility areas or lands classified as high fire hazard severity zones? Yes No

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Would the project require the installation of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d. Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

The Proposed Project area is located in a very high fire hazard zone that contains vast areas of forest which are subject to periodic wildfire (Cal Fire 2008). Fire suppression is a shared responsibility between the USFS, Cal Fire, and Shasta County, and response times in the event of a fire in the Project area can be long because of the distance to fire stations and equipment (FERC 2011). PG&E maintains fire suppression tools at existing recreation sites and its facilities, and it conducts routine facility maintenance, such as vegetation thinning and trimming under and near power lines and substations, to reduce the fire risk near existing Project facilities.

Discussion

a. Substantially impair an adopted emergency response plan or emergency evacuation plan?

Impact: Less Than Significant

Shasta County has prepared an Emergency Operations Plan that describes how the County will organize and respond to a variety of hazards, emergencies, and disasters, including major fires. Under the Emergency Operations Plan, emergency evacuations, including the coordination of movement control and transportation needs, are primarily the responsibility of the Sheriff’s Office and the County Office of Emergency Services.

The Proposed Project will not impair execution of the Emergency Operations Plan. On a temporary basis, construction traffic associated with the Proposed Project could result in temporary delays of emergency traffic during the construction period, particularly during peak recreation periods when traffic is higher, and during road improvements. However, this potential impact of the Proposed Project will not result in impairment of the Emergency Operations Plan because implementation of the Proposed Project will include implementation of the Road and Transportation Facility Management Plan, which includes an annual road operation and maintenance schedule so that land management and emergency responders are notified of construction activities prior to implementation. As part

of the construction activities required for the Proposed Project, PG&E will maintain emergency access routes during construction activities and ensure emergency vehicles can travel through or around work areas when needed.

On a long-term basis, operation and maintenance of the Proposed Project will not increase traffic in the Project area to the extent emergency response times would be impaired, and the Proposed Project does not involve inundation of or any other impact to existing evacuation and emergency service routes.

The Proposed Project will not have an adverse impact on an adopted emergency response plan or emergency evacuation plan. (Additional discussion of the potential impact of the Proposed Project on fire protection services is found in Section 3.2.15. Additional discussion of the potential impact of the Proposed Project on emergency access is found in Section 3.2.17.)

In addition, and more generally, PG&E's Fire and Fuels Management Plan will provide information necessary for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Project, as required by USFS Final 4(e) condition number 33 (Part II, 4). The Fire and Fuels Management Plan will identify: hazard reduction/fuel treatment measures; actions and locations of resources needed for fire prevention and response; and a process for reporting fires and providing necessary documents associated with any fire investigation to protect the Proposed Project and USFS resources over the term of the license.

Minimum components in the Fire and Fuels Management Plan will include:

- > Fuels treatment
- > Prevention and response
- > Access and safety
- > Emergency response preparedness
- > Reporting and response
- > Investigation of Project related fires
- > Post-fire activities

Implementation of this component of the Proposed Project will further ensure that the Proposed Project will not have a significant impact on an adopted emergency response plan or emergency evacuation plan.

Mitigation Measures: None required.

b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Impact: Less Than Significant

Under this element, a proposed project would be considered to have a significant impact if, due to existing natural factors, it increased the severity of existing fire risk in a manner that could expose project occupants to wildfires or place project occupants in areas where wildfire smoke is known to concentrate. A project that would increase the severity of existing fire risk due to natural factors could include, for example, a housing development project placed on a slope with prevailing uphill winds in a fire-prone area. Such placement could increase the amount of fuels that could feed a wildfire, which would exacerbate the existing risk of wind-driven wildfires and expose the occupants of the project to that very risk.

The Proposed Project area is located in a very high fire hazard zone that contains vast areas of steep-sloped forests which are subject to periodic wildfire (Cal Fire 2008). The Proposed Project involves use of motorized vehicles and equipment for construction and maintenance. Equipment use is one of the top causes of fire in California. The Proposed Project also includes the continued operation of hydroelectric facilities in the Project area, the presence of which could exacerbate existing fire risks. Though Project caretakers and maintenance workers and users of the Project's recreational facilities will not permanently occupy the Project area, they are considered Project occupants for the purpose of this element. The Proposed Project could potentially exacerbate fire risk and could potentially expose recreationists to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.

However, this potential impact of the Proposed Project will not be significant because the Proposed Project includes implementation of a Fire and Fuels Management Plan, and thus incorporates tools for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Project, as required by USFS Final 4(e) condition number 33 (refer to Chapter 2.4.5 for more detail). The impact of the Proposed Project related to the exposure of Project occupants to pollutant concentrations or wildfire would not be significant.

Mitigation Measures: None required.

c. Require the installation of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Impact: Less Than Significant

Under this element, a proposed project would be considered to have a significant impact if it included the construction of structures or facilities (whether temporary or permanent), the construction or operation of which could result in the temporary or ongoing exacerbation of fire risks or increase the rate or extent of the spread of wildfires.

The Proposed Project could result in impacts related to the installation of infrastructure because it includes recreational improvements that are intended to increase recreational use of the Project area on an ongoing basis. In addition, construction activities themselves raise the possibility of increased fire risks.

However, the impact of the Proposed Project will not be significant because PG&E maintains fire suppression tools at existing recreation sites and its facilities, and it conducts routine facility maintenance, such as vegetation thinning and trimming under and near power lines and substations, to reduce the fire risk near Existing Project facilities. PG&E's Fire and Fuels Management Plan will be finalized in consultation with USFS, Cal Fire, the Big Bend Volunteer Fire Department, and others, as appropriate. The Fire and Fuels Management Plan will provide information necessary for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Project, as required by USFS Final 4(e) condition number 33. For example, the Fire and Fuels Management Plan will include integration with the Sign and Interpretive/Education Plan (required by USFS Final 4(e) condition number 31), which includes signs for educating the public about fire danger and safety. The Fire and Fuels Management Plan will identify: hazard reduction/fuel treatment measures; actions and locations of resources needed for fire prevention and response; and a process for reporting fires and providing necessary documents associated with any fire investigation to protect the Proposed Project and National Forest resources over the term of the license. Other aspects of fuels management primarily related to vegetation treatments, including powerline clearance, are contained in the separate Vegetation and Invasive Weed Management Plan.

The existing risk of wildfire would continue to be very high, but the implementation of the Proposed Project will not result in the exacerbation of fire risks or an increase of the rate or extent of the spread of wildfires in the Project area, and so the impact of the Proposed Project will not be significant.

Mitigation Measures: None required..

d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Impact: Less Than Significant

Under this element, the impact of a proposed project would be considered significant if it created substantial new risks of post-fire downslope or downstream flooding or landslides or if it resulted in the placement people or structures in areas of existing risk of post-fire downslope or downstream flooding or landslides.

The Proposed Project will not result in the creation of new flooding or landslide risks. While it will result in the construction of recreational facilities that will cause a negligible increase in the amount of impervious surfaces in the Project area, the new facilities will be on relatively flat ground and will not create landslide risks, and the increase in the amount of impervious surfaces in the Project area will not be sufficient to create new flood risks.

In addition, the Proposed Project will not place people or structures in areas at existing risk of post-fire downslope or downstream flooding or landslides. A small number of small structures (e.g., vault toilets) will be constructed as part of the Proposed Project, but these structures will be built on relatively flat ground with relatively low risk of landslides. The recreational sites will not be located in areas that would see increased flooding as the result of upslope fires. The Proposed Project will not result in a significant impact related to the exposure of people or structures to post-fire flooding or landslide risk.

Finally, exposure of people or structures to significant risks associated with post-fire slope instability or drainage changes would be minimized through implementation of the Fire and Fuels Management Plan. The Plan will specifically address post-fire activities such as post-fire slope instability, runoff or drainage changes. (Additional discussion of potential impacts related to soil stability and landslides is found in Section 3.2.7. Additional discussion of potential impacts to hydrology, including alteration to drainage, runoff, and flooding patterns, is found in Section 3.2.10.) The Proposed Project will not have a significant impact regarding the exposure of people or structures to risk of post-fire downslope or downstream flooding or landslides.

Mitigation Measures: None required.

3.2.21 Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

- a. **Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?**

Impact: Less Than Significant

Impacts to biological resources, such as fish, birds, sensitive species, amphibians, reptiles, BMI communities, denning and roosting special-status mammals, and wetlands and riparian habitat from Proposed Project activities that produce noise, human activity and disturbance, ground disturbance, and vegetation removal could potentially occur. As provided in Exhibit E of the Application for New License (PG&E 2009), FERC’s final EIS (2011) and USFS 4(e) conditions, the Proposed Project includes implementation of: (a) an Aquatic Biological Monitoring Plan; (b) Erosion and Sediment Control Management Plan; (c) Large Woody Debris Plan; (d) Terrestrial Biological Management Plan; (e) Vegetation and Invasive Weed Management Plan; and (f) Water Quality Management Plan. In addition, the Proposed Project includes new ramping rate criteria and higher MIFs that are anticipated to benefit the biological community. With implementation of these plans and flows, as described above (and detailed in Section 2.4.6 of the Project Description Chapter), the Proposed Project would not degrade the quality of the environment or substantially reduce wildlife or their habitats, on either a cumulative or individual basis.

Mitigation Measures: None required.

- b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)**

Impact: Less Than Significant

When a project’s contribution to a cumulative impact does not exceed an established significant threshold, the agency may properly conclude that the project’s effects are not cumulatively considerable. For the purposes of this discussion, the significance thresholds for the Proposed Project’s contribution to cumulative impacts are the same as those thresholds set out in the discussion above.

Impacts to aesthetics from Proposed Project activities, such as construction of recreation facilities, access roads, pedestrian trails and campgrounds, and proposed road and parking area improvements, could potentially occur. However, with finalization and implementation of the Visual Quality Management Plan, potential impacts would be less than significant. The Visual Quality Management Plan will be developed in consultation with the USFS and provide measures to be implemented to meet USFS VQOs. Specifically, the Visual Quality Management Plan will assure Proposed Project-affected resources in STNF lands blend with the natural environment. Therefore, the Proposed Project’s individual contribution to aesthetics impacts is not cumulatively considerable.

The Proposed Project area does not contain agricultural land; therefore, the Proposed Project would have no individual or cumulative impact on Agricultural Resources. In regard to forest resources, the development of new recreational facilities and expansion of existing recreational facilities would result in the removal of vegetation, including trees, but the effect on timberlands would be minimal. The total area of disturbance across the Project area is expected to be less than 50 acres, which is a small percentage of the total timberlands in the region. Therefore, the Proposed Project’s individual contribution to forest resource impacts is not cumulatively considerable.

In regard to air quality and GHG emissions, the Proposed Project would be in conformance with the AQAP (SVAQEEP 2015) and would not result in operational impacts that would significantly increase criteria pollutant emissions over the long-term. Furthermore, short-term Proposed Project construction activities are not considered to be a significant source of criteria pollutants on an individual basis. CEQA Guidelines section 15064(h)(3) stipulate that for an impact involving a resource that is addressed by an approved plan or mitigation program (e.g., general maintenance-related construction activities for infrastructure), the lead agency may determine that a project’s incremental contribution is not cumulatively considerable if the project complies with the adopted plan or program. The Proposed Project would be consistent with the applicable air quality and GHG emissions plans. Therefore, the Proposed Project’s individual contribution to air quality and GHG emissions impacts is not cumulatively considerable.

Impacts to biological resources, such as fish, birds, sensitive species, amphibians, reptiles, BMI communities, denning and roosting special-status mammals, and wetlands and riparian habitat from Proposed Project activities that produce noise, human activity and disturbance,

ground disturbance, and vegetation removal could potentially occur. As provided in Exhibit E of the Application for New License (PG&E 2009), FERC's final EIS (2011) and USFS 4(e) conditions, the Proposed Project includes implementation of: (a) an Aquatic Biological Monitoring Plan; (b) Erosion and Sediment Control Management Plan; (c) Large Woody Debris Plan; (d) Terrestrial Biological Management Plan; (e) Vegetation and Invasive Weed Management Plan and (f) Water Quality Management Plan. In addition, the Proposed Project includes new ramping rate criteria and higher MIFs that are anticipated to benefit the biological community. Therefore, the Proposed Project's individual contribution to biological resource impacts is not cumulatively considerable.

Impacts to cultural resources, such as archaeological and historical artifacts, could potentially occur. However, implementation of the Historic Properties Management Plan that is part of the Proposed Project would reduce impacts on cultural resources to less than significant. Therefore, the Proposed Project's individual contribution to cultural resource impacts is not cumulatively considerable.

Impacts to mineral resources and to geology and soils, such as the potential of increased erosion related to new construction, could potentially occur. However, implementation of the: (a) Erosion and Sediment Monitoring and Control Plan and (b) Road and Transportation Facility Management Plan, that are part of the Proposed Project would reduce impacts to geology and soils to less than significant. Therefore, the Proposed Project's individual contribution to mineral resource, geology, and soil impacts is not cumulatively considerable.

Impacts associated with hazards and hazardous materials, such as the potential of hazardous material spills during construction, wildland fires, or recreational hazards near the Pit 7 Afterbay, could occur. However, implementation of the: (a) Spill Prevention, Control and Countermeasure Plan; and (b) Fire and Fuels Management Plan, that are part of the Proposed Project would reduce hazards-related impacts to less than significant. Therefore, the Proposed Project's individual contribution of hazards and hazardous materials impacts is not cumulatively considerable.

Impacts to hydrology and water quality, such as the potential of increased erosion related to new construction, could potentially occur. However, implementation of the: (a) SWPPP pursuant to the requirements of the Construction General Permit; (b) Erosion and Sediment Control Management Plan; (c) Water Quality and Temperature Monitoring Plan; (d) Road and Transportation Facility Management Plan; and (e) new ramping rates and higher MIFs, that are part of the Proposed Project would reduce impacts related to hydrology and water quality to less than significant. Therefore, the Proposed Project's individual contribution to hydrology and water quality impacts is not cumulatively considerable.

Impacts to recreation, such as overall recreation use, angling and whitewater boating on the McCloud River below McCloud Dam, could occur. However, with implementation of the: (a) Recreation Development and Management Plan; (b) the new ramping rates and MIFs; and (c) the construction of new and improved recreation facilities, that are part of the Proposed Project would reduce impacts related to recreation to less than significant.

Therefore, the Proposed Project's individual contribution to recreation impacts is not cumulatively considerable.

The Proposed Project's activities are consistent the Shasta County General Plan (2004) land use projections including increases to traffic, noise, public services, population and housing, and utilities and service systems. Therefore, the Proposed Project's individual contribution to land use and planning, noise, population and housing, public services, and utilities and service systems impacts is not cumulatively considerable.

Impacts to traffic and transportation, such as increased road hazards caused by winding and steep roads used by large trucks and construction equipment, could potentially occur. However, implementation of the Proposed Project's Road and Transportation Facility Management Plan, which includes measures to provide signs, properly notify travelers of activities, and establish routes for truck and equipment traffic, would reduce impacts related to traffic and transportation to less than significant. Therefore, the Proposed Project's individual contribution to traffic and transportation impacts is not cumulatively considerable.

Mitigation Measures: None required.

c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

Impact: Less Than Significant

As discussed previously, the Proposed Project would not expose persons to adverse impacts related to air quality, geologic hazards, GHG emissions, hazards or hazardous materials, hydrology or water quality, land use and planning, noise, population and housing, or transportation/traffic hazards, or prevent utility services. These impacts were determined to have no impact or a less than significant impact due to implementation of the environmental management and monitoring plans that are part of the Proposed Project. Therefore, the Proposed Project does not have significant environmental impacts which would cause substantial adverse effects on humans either directly or indirectly, on a cumulative or individual basis.

Mitigation Measures: None required.

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PG&E McCloud-Pit Hydroelectric Project
Draft Initial Study / Negative Declaration

APPENDIX

A

NOTICE OF SECTION 15063(G)
INFORMAL CONSULTATION WITH
RESPONSIBLE AND TRUSTEE
AGENCIES

State Water Resources Control Board

**NOTICE OF SECTION 15063(g) INFORMAL CONSULTATION
WITH RESPONSIBLE AND TRUSTEE AGENCIES REGARDING AN
ENVIRONMENTAL DOCUMENT FOR WATER QUALITY CERTIFICATION**

**MCCLOUD-PIT HYDROELECTRIC PROJECT,
FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2106**

To: Responsible and Trustee Agencies

The State Water Resources Control Board (State Water Board) plans to prepare an environmental document for Pacific Gas and Electric's (PG&E) McCloud-Pit Hydroelectric Project (Project) pursuant to the California Environmental Quality Act (CEQA) (Pub. Res. Code, § 21000 *et seq.*). The Project is located on the McCloud and Pit Rivers in Shasta County, California, and consists of three power generating developments (James B. Black, Pit 6, and Pit 7). These developments collectively include four reservoirs, three powerhouses, five dams, two tunnels, one afterbay, and associated equipment and transmission facilities. The locations of the Project facilities are depicted in the attached map (Figure 1.1). The majority of Project lands are managed by the United States Department of Agriculture – Forest Service. The Project also occupies land managed by the Bureau of Land Management, as well as land owned by PG&E and other private land holders.

The Project, which is licensed by the Federal Energy Regulatory Commission (FERC), is identified as FERC Project No. 2106. FERC issues licenses for the operation of projects for 30 to 50 years. PG&E applied to FERC for a new license in 2009. The existing license expired on July 31, 2011, and the Project continues to operate under an annual license issued by FERC. In compliance with the National Environmental Policy Act (NEPA), FERC prepared the *Final Environmental Impact Statement (EIS) for Hydropower License, McCloud-Pit Hydroelectric Project FERC Project No. 2106, California* (Issued: February 25, 2011). Copies of the Final EIS are available for review in the Commission's Public Reference Branch, Room 2A, located at 888 First Street, N.E., Washington DC 20426. The Final EIS is also available online at: <http://www.ferc.gov/industries/hydropower/enviro/eis/2011/02-25-11.asp>.

In accordance with section 401 of the Clean Water Act, PG&E also applied to the State Water Board for a water quality certification (certification) for the Project. PG&E's request for certification for the Project was received by the State Water Board on December 20, 2011. The State Water Board must comply with the CEQA prior to issuing a certification.

When a Final EIS for a project is complete, the CEQA lead agency should use the federal EIS as the environmental document, if the Final EIS complies with the CEQA Guidelines¹. (Cal. Code Regs., tit. 14, §15221, subd. (a).) In this instance, the Final EIS meets many of the requirements of CEQA, and will form the basis for the State Water Board's environmental document. In some areas, however, to comply with CEQA the State Water Board's environmental document will need to differ from the Final EIS.

NOTICE OF INFORMAL CONSULTATION

Pursuant to CEQA (Cal. Code Regs., tit. 14, §15063, subd. (g).), notice is hereby given that the State Water Board is conducting informal consultation with the responsible and trustee agencies (Agencies) to solicit input on the Project's CEQA process. Recipients of this Notice are encouraged to inform others who are interested in the Project about this Notice.

The purpose of the consultation is to seek input from the Agencies responsible for resources affected by the Project. The State Water Board would like to obtain recommendations and supporting information from Agencies regarding whether an Environmental Impact Report or a Negative Declaration should be prepared. While it is not required by CEQA, the State Water Board will accept similar input and supporting information from interested members of the public.

Recommendations and supporting information should be provided to the staff person by the deadline indicated below in the Consultation Deadline and Contact section of this Notice.

PROJECT DESCRIPTION

PG&E's existing Project has an installed generating capacity of 368-megawatts. As part of the application for a new FERC license, PG&E proposes changes to the Project's existing operations. For additional information, see the FERC NEPA document mentioned in the second paragraph of this Notice. The following are the primary proposed changes between the Existing Project and the Proposed Project for the purposes of CEQA:

1. Changes to instream flows in Lower McCloud River and Iron Canyon Creek to improve aquatic resources;
2. Implementation of Management and Monitoring Plans to improve aquatic resources; and
3. Maintain and enhance recreational opportunities, including construction to provide additional recreation facilities.

The range and schedule of river flow in the Proposed Project are intended to support the various beneficial uses and water quality of the Existing Project area and downstream reaches. These beneficial uses include providing new or improved water based recreational facilities. The State Water Board will utilize the CEQA analysis results to support an informed decision whether to issue certification and if so, under what conditions. Issuance of a certification requires an analysis of a project's overall effect on water quality and an analysis of whether the designated beneficial uses identified in the appropriate water quality control plan (basin plan) are adequately protected.

¹ Cal. Code Regs., tit. 14, §15000 *et seq.*

CONSULTATION DEADLINE AND CONTACT

The State Water Board will accept written input **until 12:00 PM (noon) on November 30, 2012**. Written input should specifically identify that it is provided as part of the "McCloud-Pit CEQA Section 15063(g) Informal Consultation." Written input can be submitted by mail or electronically to:

Amber Villalobos
State Water Resources Control Board
Division of Water Rights – Water Quality Certification Program
P.O. Box 2000
Sacramento, CA 95812-2000
or
Email: avillalobos@waterboards.ca.gov

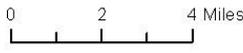
Questions regarding this Notice may be directed to Amber Villalobos at (916) 323-9389, or via email to avillalobos@waterboards.ca.gov.

ORIGINAL SIGNED BY:

Erin Ragazzi
Water Quality Certification Program Manager

Dated: OCT 26 2012

Enclosures: Figure 1.1: McCloud-Pit Project Location
Distribution List



McCloud-Pit Project
FIGURE 1-1
 McCloud-Pit Project Location



DISTRIBUTION LIST

MAILING LIST	
Water Rights & FERC Calif Department of Fish and Game PO Box 944209 Sacramento, CA 94244-2090	Director US Bureau of Land Management 2800 Cottage Way Ste W1834 Sacramento, CA 95825-1886
U.S. Fish and Wildlife Service Field Supervisor 2800 Cottage Way, Room W-2605 Sacramento, CA 95825-1846	Kathy A Valenzuela Shasta Trinity National Forest 3644 Avtech Pkwy Redding, CA 96002
STATE OF CALIFORNIA California Air Resources Board PO Box 2815 Sacramento, CA 95812-2815	Margaret J. Kim California Resources Agency 1416 9th Street, Suite 1311 Sacramento, CA 95814
U.S. Fish and Wildlife Service Attn: FERC Coordinator 911 NE 11th Ave Portland, OR 97232-4169	Chief US Army Corps of Engineers 333 Market Street, 8th Floor San Francisco, CA 94105-2102
District Chief US Geological Survey Placer Hall - 6000 J Street, Ste 2012 Sacramento, CA 95819-6129	US Environmental Protection Agency 75 Hawthorne Street San Francisco, CA 94105-3920
Ms. Alexis Strauss, Director Water Division USEPA, Region 9 75 Hawthorne Street San Francisco, CA 94105	Mr. Robert Crandall Assistant Executive Officer Regional Water Quality Control Board 415 Knollcrest Drive Redding, CA 96002
Ms. Kimberly D. Bose Secretary Federal Energy Regulatory Commission 888 First Street, N.E. Washington, DC 20426	Mr. David Moller Pacific Gas and Electric Company Mail Code N11E P.O. Box 70000 San Francisco, CA 94177-0001
FERC Contact California Fish and Game Commission Attn: Environmental Services Division 1416 9th Street Sacramento, CA 95814	Christopher Shutes FERC Projects Director 1608 Francisco Street Berkeley, CA 94703

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