



Draft Initial Study / Mitigated Negative Declaration

PG&E's Upper Drum-Spaulding
Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project
(FERC No. 14531)

Nevada and Placer Counties, California

December 2020

Prepared for:

State Water Resources Control Board

Prepared by:

HDR

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1 Introduction

The State Water Resources Control Board (State Water Board) has prepared this draft Initial Study/Mitigated Negative Declaration (IS/MND) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of relicensing the two specified Pacific Gas and Electric Company (PG&E) hydroelectric projects, collectively referred to as the Proposed Projects:

- Upper Drum-Spaulding Hydroelectric Project (Proposed Upper Drum-Spaulding Project) - Federal Energy Regulatory Commission (FERC) Project No. 2310; and
- Lower Drum Hydroelectric Project (Proposed Lower Drum Project) - FERC Project No. 14531.

The Proposed Projects are located in Placer and Nevada Counties on the South Yuba River, Bear River, North Fork of the North Fork American River, and their tributaries. The Proposed Projects are described in detail in Section 2.2, *Proposed Upper Drum-Spaulding Project Description*, and Section 2.3, *Proposed Lower Drum Project Description*. This document has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) of 1970 (Pub. Resources Code, § 21000 et seq.) and the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.). This IS/MND relies on expert opinion, technical studies, and other evidence to substantiate its findings.

1.1 Intent and Scope of this Document

This environmental review reflects a project-level evaluation of the proposed relicensing, including routine maintenance and ongoing operations, of the Proposed Projects within the South Yuba River, Bear River, North Fork of the North Fork American River, and their tributaries (Cal. Code Regs., tit. 14, § 15378). As part of this new license, FERC has recommended a series of physical improvements, which would be defined and developed through plan development and feasibility studies during early license implementation. While plan development and feasibility studies do not in themselves generate environmental impacts, those plans would consider those environmental factors. Subsequent CEQA analysis would be required once those projects and activities are defined and before those projects could be implemented. At this time, those recommendations and activities are too speculative to analyze.

The scope of analysis included in this IS/MND focuses on the relicensing and, specifically, the routine maintenance and operations within these waterbodies, which is

the basis of the decision to be made by the State Water Board. The State Water Board, as the CEQA Lead Agency, will consider the Proposed Projects' potential environmental impacts when determining whether to approve them. The intent of this IS/MND is to provide the public and decision-making agencies with information about the environmental impacts that could result from implementation of the Proposed Projects.

This IS/MND describes the Proposed Projects and their environmental setting, including existing conditions; identifies the Proposed Projects' potential environmental impacts, and presents mitigation measures that would be implemented to avoid, reduce, or mitigate potentially significant impacts.

1.2 Public Review Process

Public involvement is an integral part of the CEQA environmental review process. CEQA requires the disclosure of information about the Proposed Projects to the public and agency decision-makers and seeks to foster public participation and informed decision making.

This IS/MND is being circulated for public review to the California Office of Planning and Research State Clearinghouse for distribution to appropriate resource agencies and posting on CEQAnet, and to the Placer and Nevada County Clerks for posting.

A Notice of Intent has been distributed to the interested parties mailing list identified by FERC. The Notice of Intent identifies locations where the document will be available for public review, including online at CEQAnet, and invites interested parties to provide written comments.

All comments received by the date identified for closure of the public comment period in the Notice of Intent will be considered by the State Water Board during preparation of the final IS/MND. Comments can be submitted electronically or by mail to:

Email: WR401Program@waterboards.ca.gov

or

State Water Resources Control Board
Division of Water Rights – Water Quality Certification Program
Attn: Mr. Jordan Smith
P.O. Box 2000
Sacramento, CA 95812-2000

In addition, the State Water Board has provided the Notice of Intent to adopt an MND by publication, in accordance with section 15072, subdivision (b) of the CEQA Guidelines, by noticing in the Union in Grass Valley and Nevada City. Copies of the Notice of Intent

are posted at the County Clerks of Placer and Nevada County. The IS/MND is available at the State Water Board's headquarters in Sacramento, the Placer County Clerk in Auburn, and the Lahontan Regional Water Quality Control Board's office in South Lake Tahoe.

1.3 Organization of this Document

This IS/MND contains the following components:

- **Chapter 1 – Introduction:** Provides a brief description of the intent and scope of this IS/MND, the public and agency involvement process under CEQA, and the organization of and terminology used in this IS/MND.
- **Chapter 2 – Proposed Projects:** This chapter includes the Proposed Projects' description, including existing and proposed facilities; operations; management plans; and relevant required permits and approvals.
- **Chapter 3 – Environmental Checklist Form:** Includes an environmental setting description for each resource topic and identifies the Proposed Projects' anticipated environmental impacts, as well as any mitigation measures that would be required to reduce potentially significant impacts to a less than-significant level. This chapter also includes the environmental checklists used to assess the Proposed Projects' potential environmental effects, which is based on the model provided in Appendix G of the CEQA Guidelines.

1.4 Impact Terminology

This IS/MND uses the following terms to describe the environmental effects of the Proposed Projects:

- **No Impact:** This finding is made when the analysis concludes that the Proposed Projects would not affect a particular environmental resource or issue.
- **Less than Significant:** This finding is made when the analysis concludes that the Proposed Projects would have no substantial adverse environmental impact and no mitigation is needed.
- **Less than Significant with Mitigation Incorporated:** This finding is made when the analysis shows that the Proposed Projects would have no substantial adverse environmental impact with inclusion of the mitigation measure described, thereby reducing an otherwise potentially significant impact to less than significant.
- **Potentially Significant:** This finding is made when the analysis concludes that the Proposed Projects could have a substantial adverse effect on the environment. This

finding is appropriate when mitigation does not reduce the severity of the effect to less than significant.

- **Mitigation:** Mitigation refers to specific measures or activities to avoid or reduce the severity of potentially significant impacts, or compensate for potentially significant impacts associated with implementation of the Proposed Projects.
- **Cumulative Impact:** Cumulative impacts are impacts that potentially could result when a change in the environment results from the incremental impact of the Proposed Projects when added to other related past, present, or reasonably foreseeable future projects. Significant cumulative impacts may result from individually minor but collectively significant impacts of projects.

1.5 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 Projects. PG&E and its contractors would adhere to all applicable requirements. Major federal, state, and local permits, approvals, and consultations identified for the licensing, construction, and operation of the Proposed Projects are described in Section 3, *Environmental Checklist Form*.

1.6 Objectives of the Proposed Projects

The objective of the Proposed Projects is to continue to operate the existing facilities by obtaining and implementing new hydropower licenses for the existing facilities that would provide safe, economical, and reliable electric generation in a responsible and environmentally sensitive manner over the term of the license. The Proposed Projects would obtain a new license for a 30 to 50-year term from FERC.



2 Proposed Projects

This IS/MND evaluates the environmental impacts of continued operations and relicensing on a 30- to 50- year term of the Proposed Projects. For purposes of CEQA analysis, the project being considered by the State Water Board is issuance of a water quality certification, pursuant to section 401 of the federal Clean Water Act, for the relicensing of the Proposed Projects, with appropriate conditions to ensure that the Proposed Projects are operated in a manner that is protective of water quality and the designated beneficial uses of water. The Proposed Projects include: (a) PG&E's Proposed Projects as described in its applications to FERC; (b) conditions proposed by United States (U.S.) Forest Service pursuant to Section 4(e) of the Federal Power Act; (c) FERC's Staff Alternatives; and (d) conditions of the water quality certification necessary to protect water quality.

The new licenses for the Proposed Projects would require several changes to recreation sites and facilities. Because the future recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis. This CEQA analysis does include routine maintenance work to maintain the original function and capacity of facilities, as well as work that involves minor, or no ground disturbance. Site and construction plans for future undefined work associated with the Proposed Projects will require discretionary approvals and environmental analysis prior to any construction activities.

2.1 Proposed Projects Background

On June 24, 1963, FERC issued an original license for PG&E's Drum-Spaulding Hydroelectric Project. The FERC license had an effective period from May 1, 1963 to April 30, 2013. Since the original license expired in 2013, the facilities have continued to operate under annual license extensions issued by FERC.

On April 12, 2011, PG&E filed with FERC a license application proposing to relicense the Drum-Spaulding Hydroelectric Project for a new 30- to 50-year term. On February 12, 2012, PG&E filed an application with the State Water Board for a water quality certification for the relicensing. On May 31, 2013, PG&E filed a license application amendment that proposed to split the Drum-Spaulding Hydroelectric Project into three new licensed projects: Upper Drum-Spaulding Hydroelectric Project, Lower Drum Hydroelectric Project, and the Deer Creek Hydroelectric Project (FERC Project No. 14530). PG&E's most recent application for a water quality certification, dated February 4, 2020, did not include the Deer Creek Hydroelectric Project.

The 2011 license application and subsequent license amendment applications proposed minimal changes to existing operations (PG&E 2011). The proposed changes specific to the Upper Drum-Spaulding Hydroelectric Project facilities and the Lower Drum Hydroelectric Project facilities are described in Section 2.2, *Proposed Upper Drum-Spaulding Project Description*, and Section 2.3, *Proposed Lower Drum Project Description*. PG&E and the Nevada Irrigation District (NID) filed a joint application to transfer the Deer Creek facilities and license from PG&E to NID on January 22, 2019. On October 10, 2019, the California Public Utilities Commission approved the sale, which is awaiting FERC's final approval. NID will be responsible for CEQA compliance for relicensing of, or other actions regarding, the Deer Creek Hydroelectric Project.

2.2 Proposed Upper Drum-Spaulding Project Description

2.2.1 Location and Setting

PG&E's Upper Drum-Spaulding Hydroelectric Project, FERC Project No. 2310, is located in Nevada and Placer Counties, in California, on the South Yuba River, Bear River, and North Fork of the North Fork American River. Given the dispersed nature of the facilities, the Upper Drum-Spaulding Hydroelectric Project do not have a single physical address. The Proposed Upper Drum-Spaulding Project encompasses the Upper Drum-Spaulding Hydroelectric Project in addition to operations changes and environmental measures described below.

PG&E proposes that the Upper Drum-Spaulding Hydroelectric Project Boundary be amended to 4,212.7 acres. This is a reduction of 172.2 acres from the 4,384.9 acres previously identified as part of the existing FERC license. The change in acreage is a result of increased accuracy in defining the FERC facilities boundary, which has been made possible by new geographic mapping tools developed since the previous license was approved.

The Upper Drum-Spaulding Hydroelectric Project Boundary would include federal land in the National Forest System (i.e., National Forest lands) managed by the U.S. Department of Agriculture (USDA), Forest Service, as part of the Tahoe National Forest (949.3 acres, 23 percent of total), which is a reduction of 229.7 acres from previous license boundaries. All other lands within the boundary would be in private ownership, either by PG&E (3,064 acres, 73 percent) or private landowners (199.4 acres, 4 percent), an addition of 57.5 acres. Figure 2-1 illustrates the general regional location of the Upper Drum-Spaulding Hydroelectric Project.

2.2.2 Background

The Upper Drum-Spaulding Hydroelectric Project is located in Nevada and Placer Counties, California, and consists of 24 dams and reservoirs, seven powerhouses, four overhead transmission lines, 1 diversion dam, and various water conduits, recreation facilities, and other associated facilities and structures. The Upper Drum-Spaulding Hydroelectric Project's dams are located on the South Yuba River, Bear River, Fordyce Creek, North Fork of the North Fork American River, and associated tributaries (Figure 2-1).

The locations of features included in the Upper Drum-Spaulding Hydroelectric Project range in elevation from 7,820 feet (ft) at White Rock Reservoir (above Fordyce Lake) to 2,755 ft at Dutch Flat No.1 powerhouse. Major reservoirs of the Upper Drum-Spaulding Hydroelectric Project include Lake Spaulding (74,773 acre-feet [ac-ft]) on the South Yuba River, Fordyce Lake (49,903 ac-ft) on Fordyce Creek above Lake Spaulding, Lake Valley Reservoir (7,964 ac-ft) on the North Fork of the North Fork American River, Culbertson Lake (3,150 ac-ft), and Meadow Lake (4,935 ac-ft) on a tributary to Fordyce Creek (Figure 2-2). All other Upper Drum-Spaulding Hydroelectric Project reservoirs are less than 2,000 ac-ft. The seven powerhouses have a combined normal operating capacity of 147.1 megawatts (MW).

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PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

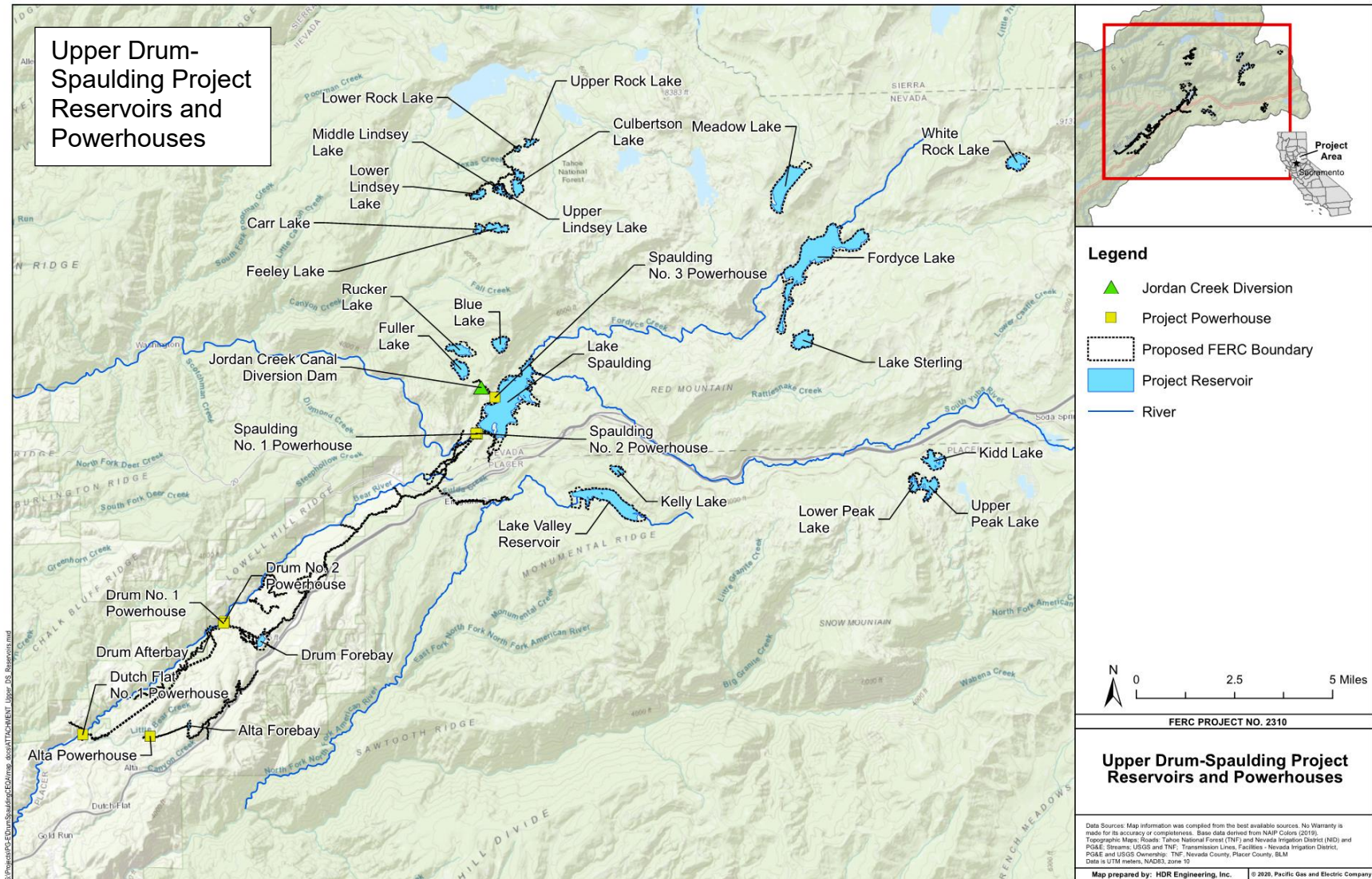


Figure 2-1. Regional Map of Upper Drum-Spaulding Hydroelectric Project

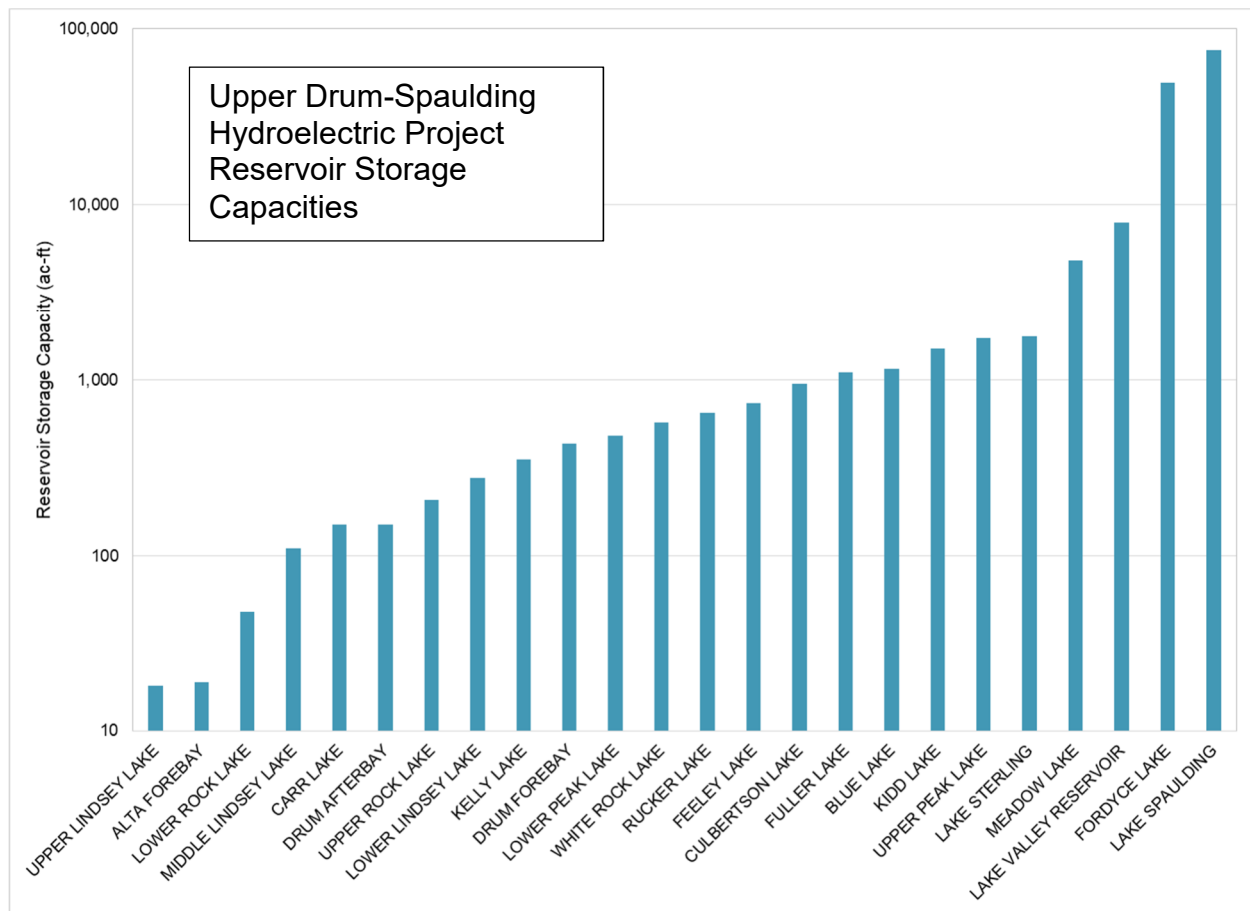


Figure 2-2. Upper Drum-Spaulding Hydroelectric Project Reservoir Storage Capacities

Table 2-1 below presents the existing FERC license minimum streamflows (first number) and additional releases made by PG&E operators to ensure compliance of the minimum streamflow (second number), which is commonly referred to as a buffer flow. The minimum flow plus the buffer flow was used during FERC relicensing in the water operations model to define baseline conditions. Buffer flows were provided by PG&E operations staff with the exception of Fordyce Creek below Fordyce Dam. Fordyce Dam has high rates of leakage that vary based on Fordyce Lake water-surface elevation. Buffer flows at this location (YB-200) are given as a range and represent the typical range of flows within the normal reservoir operating range.

Table 2-1. Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>South Yuba River – Below Kidd Lake Dam and Lower Peak Lake Dam (at Cisco Grove) (Compliance Point: YB-316)</i>						
October	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
November	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
December	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
January	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
February	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
March	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
April	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
May	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
June	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
July	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
August	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
September	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7	5/0.7
<i>Fordyce Creek – Below Fordyce Lake Dam (Compliance Point: YB-200)</i>						
October	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
November	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
December	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
January	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18



Table 2-1. Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
February	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
March	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
April	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
May	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
June	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
July	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
August	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
September	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18	5/7.5-18
<i>South Yuba River – Below Lake Spaulling Dam (Compliance Point: YB-29)</i>						
October	5/2	5/2	5/2	5/2	5/2	5/2
November	5/2	5/2	5/2	5/2	5/2	5/2
December	5/2	5/2	5/2	5/2	5/2	5/2
January	5/2	5/2	5/2	5/2	5/2	5/2
February	5/2	5/2	5/2	5/2	5/2	5/2
March	5/2	5/2	5/2	5/2	5/2	5/2
April	5/2	5/2	5/2	5/2	5/2	5/2
May	5/2	5/2	5/2	5/2	5/2	5/2
June	5/2	5/2	5/2	5/2	5/2	5/2
July	5/2	5/2	5/2	5/2	5/2	5/2
August	5/2	5/2	5/2	5/2	5/2	5/2
September	5/2	5/2	5/2	5/2	5/2	5/2
<i>North Fork of North Fork American River – Below Lake Valley Reservoir Dam (Compliance Point: YB-104)</i>						
October	1/3	1/3	1/3	1/3	1/3	1/3
November	1/3	1/3	1/3	1/3	1/3	1/3
December	1/3	1/3	1/3	1/3	1/3	1/3
January	1/3	1/3	1/3	1/3	1/3	1/3

Table 2-1. Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>North Fork of North Fork American River – Below Lake Valley Reservoir Dam (Compliance Point: YB-104)</i>						
February	1/3	1/3	1/3	1/3	1/3	1/3
March	1/3	1/3	1/3	1/3	1/3	1/3
April	1/3	1/3	1/3	1/3	1/3	1/3
May	3/3	3/3	3/3	3/3	3/3	3/3
June	3/3	3/3	3/3	3/3	3/3	3/3
July	3/3	3/3	3/3	3/3	3/3	3/3
August	3/3	3/3	3/3	3/3	3/3	3/3
September	1/3	1/3	1/3	1/3	1/3	1/3
<i>North Fork of North Fork American River – Below Lake Valley Canal Diversion Dam (Compliance Point: YB-236)</i>						
October	1/1	1/1	1/1	1/1	1/1	1/1
November	1/1	1/1	1/1	1/1	1/1	1/1
December	1/1	1/1	1/1	1/1	1/1	1/1
January	1/1	1/1	1/1	1/1	1/1	1/1
February	1/1	1/1	1/1	1/1	1/1	1/1
March	1/1	1/1	1/1	1/1	1/1	1/1
April	1/1	1/1	1/1	1/1	1/1	1/1
May	1/1	1/1	1/1	1/1	1/1	1/1
June	1/1	1/1	1/1	1/1	1/1	1/1
July	1/1	1/1	1/1	1/1	1/1	1/1
August	1/1	1/1	1/1	1/1	1/1	1/1
September	1/1	1/1	1/1	1/1	1/1	1/1
<i>Bear River – At Highway 20 Crossing (Compliance Point: YB-198)</i>						
October	5/2	5/2	5/2	5/2	5/2	5/2



Table 2-1. Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>Bear River – At Highway 20 Crossing (Compliance Point: YB-198)</i>						
November	5/2	5/2	5/2	5/2	5/2	5/2
December	5/2	5/2	5/2	5/2	5/2	5/2
January	5/2	5/2	5/2	5/2	5/2	5/2
February	5/2	5/2	5/2	5/2	5/2	5/2
March	5/2	5/2	5/2	5/2	5/2	5/2
April	5/2	5/2	5/2	5/2	5/2	5/2
May	5/2	5/2	5/2	5/2	5/2	5/2
June	5/2	5/2	5/2	5/2	5/2	5/2
July	5/2	5/2	5/2	5/2	5/2	5/2
August	5/2	5/2	5/2	5/2	5/2	5/2
September	5/2	5/2	5/2	5/2	5/2	5/2
<i>Bear River – Below Drum Afterbay (Compliance Point: YB-44)</i>						
October	5/2	5/2	5/2	5/2	5/2	5/2
November	5/2	5/2	5/2	5/2	5/2	5/2
December	5/2	5/2	5/2	5/2	5/2	5/2
January	5/2	5/2	5/2	5/2	5/2	5/2
February	5/2	5/2	5/2	5/2	5/2	5/2
March	10/2	10/2	10/2	10/2	10/2	10/2
April	10/2	10/2	10/2	10/2	10/2	10/2
May	10/2	10/2	10/2	10/2	10/2	10/2
June	10/2	10/2	10/2	10/2	10/2	10/2
July	10/2	10/2	10/2	10/2	10/2	10/2
August	10/2	10/2	10/2	10/2	10/2	10/2
<i>Bear River – Below Drum Afterbay (Compliance Point: YB-44)</i>						
September	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25

Table 2-1. Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>Canyon Creek – Below Towle Canal Diversion Dam (Compliance Point: YB-282)</i>						
October	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
November	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
December	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
January	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
February	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
March	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
April	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
May	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
June	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
July	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
August	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
September	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25	1/0.25
<i>Little Bear River – Below Alta Powerhouse Tailrace (Compliance Point: YB-98)</i>						
October	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
November	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
December	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
January	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
February	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
March	0.25/0.15	0.25/0.15	0.25/0.15	0.25/ 0.15	0.25/0.15	0.25/0.15
April	0.25/0.15	0.25/0.15	0.25/0.15	0.25/ 0.15	0.25/0.15	0.25/0.15
May	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
June	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
July	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
August	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15
September	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15	0.25/0.15

Baseline minimum streamflows for small lakes in the Upper Drum-Spaulding Hydroelectric Project are shown in Table 2-2.

Table 2-2. Small Lakes' Baseline Minimum Outlet Streamflows in Cubic Feet per Second

Lake/Reservoir	Minimum Flow	Buffer Flow	When Applicable
Blue Lake	0.5	0.2	Year round
Rucker Lake	0.5	0.2	Year round
Feeley Lake	0.5	0.2	Year round
Carr Lake	0.5	0.2	Year round
Middle Lindsey Lake	0.25	0.1	July 1-Sep 30 only
Lower Lindsey Lake	0.5	0.2	Year round
Culbertson Lake	0.75	0.2	Year round
Upper Rock Lake	0.25	0.1	July 1-Sep 30 only
Lower Rock Lake	0.25	0.1	July 1-Sep 30 only

2.2.3 Facilities

PG&E seeks, for the Proposed Upper Drum-Spaulding Project, to obtain a new FERC license with a total installed capacity of 147.1 MW for a maximum period of 50 years. The Proposed Upper Drum-Spaulding Project includes five developments (that is, facilities linked hydraulically to a common powerhouse) consisting of:

1. Spaulding No. 3,
2. Spaulding No. 1 and No. 2,
3. Alta,
4. Drum No. 1 and No. 2, and
5. Dutch Flat No. 1.

Facilities are shown in Figure 2-1, and descriptions of these facilities are available in Appendix A, *Upper Drum-Spaulding Additional Information*.

PG&E's proposed changes to flow release operations at dams are discussed in Section 2.2.3.1, *Modifications to Operations*. Proposed rehabilitation or expansion of existing facilities, and types of construction activities that could occur are described in Section 2.2.3.2, *Construction Activities*. PG&E's current and proposed future maintenance is described in Section 2.2.3.3, *Routine Maintenance*. Section 2.2.3.4, *License Articles*, describes the proposed Articles (i.e., terms and conditions) that FERC,

PG&E, the Forest Service, and others propose be included in the new FERC license and the Proposed Upper Drum-Spaulding Project, that would result in operational and/or physical modifications or additions within the Proposed Upper Drum-Spaulding Project area. PG&E's proposed conditions were included in its 2011 Application for New License and subsequent amendments (PG&E 2011). FERC's recommended articles were provided in its 2014 final EIS (FEIS) document, which also considered recommendations from the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and other agencies (FERC 2014). The Forest Service's final 4(e) conditions were filed with FERC on April 10, 2014. A full list of existing and proposed FERC License Articles, Forest Service 4(e) conditions, and PG&E Conditions is included in Appendix A, *Upper Drum-Spaulding Additional Information*. No modifications to PG&E's water rights would be needed for the Proposed Upper Drum-Spaulding Project under the proposed new license.

2.2.3.1 Modifications to Operations

Future operation of existing structures that make up the Proposed Upper Drum-Spaulding Project would be generally consistent with existing operation, except for new and increased minimum flow releases and modified ramping rates. PG&E also proposes the following: (1) re-operation between PG&E's Dutch Flat No. 1 and NID's Dutch Flat No. 2 powerhouses to be based on water rights rather than operational or efficiency considerations and (2) documentation in new license agreement of use of modified winter/spring operations implemented in 1997.

2.2.3.1.1 *Minimum Stream Flows*

PG&E proposes to modify operations for the Upper Drum-Spaulding Hydroelectric Project affecting minimum streamflows, spills from canals and conduits, and the rate of flow fluctuations following spill events, to provide environmental benefits to aquatic resources. Increased flows, reduced flow fluctuations, and cooler water temperatures that would result from flow measures proposed by PG&E and the relicensing stakeholders to enhance aquatic habitat also have the potential to affect habitat for special-status species in some reaches.

Part 1 of Proposed Measure DS-AQR1 in the Final License Application, *Streamflows*, specifies that within 90 days of FERC license issuance PG&E would determine the water year type in each of the months of February, March, April, May, and October and use this determination in implementing articles and conditions of the license (PG&E 2011). Thresholds and criteria for determining water year type are also provided in this section of the proposed license.



Part 2 of Proposed Measure DS-AQR1 specifies minimum streamflows for river reaches by month and water year type (Table 2-3). The proposed FERC license includes six water year types, whereas the previous license categorized releases based on only two water year types (normal and dry).

Table 2-3 below presents the proposed instream flows (first number) and the buffer flows (second number), similar to the baseline table presented above (Table 2-1). The minimum streamflows plus the buffer flows were used during FERC relicensing in the water operations model to define Proposed Upper Drum-Spaulding Project conditions. Buffer flows were provided by PG&E operations staff. The table also includes the net change in flow between Proposed Project conditions and the baseline. This value was calculated as the proposed minimum streamflow plus the proposed buffer flow, minus the baseline minimum streamflow plus the baseline minimum flow. The net differences presented in this table show that streamflows are equal to or greater than the baseline except for Fordyce Creek below Fordyce Lake. PG&E is undertaking a repair project to stabilize Lake Fordyce Dam which will reduce the seepage from Lake Fordyce. Fordyce Creek flows will be reduced by as much as 6 cubic feet per second (cfs) (35 percent) during dry years from November to April, but the proposed minimum streamflows below Fordyce Dam are higher in all months relative to the current minimum instream flows.

Table 2-3. Proposed Upper Drum-Spaulding Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>South Yuba River – Below Kidd Lake Dam and Lower Peak Lake Dam (at Cisco Grove) (Compliance Point: YB-316)</i>						
October	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
November	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
December	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
January	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
February	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
March	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
April	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)

Table 2-3. Proposed Upper Drum-Spaulding Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
May	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
June	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
July	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
August	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
September	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)	5/0.7 (+0)
<i>Fordyce Creek – Below Fordyce Lake Dam (Compliance Point: YB-200)</i>						
October	20/2-3 (-1 to 0)	20/2-3 (-1 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
November	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
December	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
January	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
February	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
March	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
April	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	15/2-8 (-6 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
May	40/3 (+20 to 30.5)	40/3 (+20 to 30.5)	40/3 (+20 to 30.5)	40/3 (+20 to 30.5)	45/3 (+25 to 35.5)	45/3 (+25 to 35.5)



Table 2-3. Proposed Upper Drum-Spaulling Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
June	30/2 (+9 to 19.5)	30/2 (+9 to 19.5)	30/2 (+9 to 19.5)	30/2 (+9 to 19.5)	45/3 (+25 to 35.5)	45/3 (+25 to 35.5)
July	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)	30/2 (+9 to 19.5)	30/2 (+9 to 19.5)
August	20/2-3 (-1 to 0)	20/2-3 (-1 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
September	20/2-3 (-1 to 0)	20/2-3 (-1 to 0)	20/2-3 (-1 to 0)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)	25/2 (+2 to 12.5)
South Yuba River – Below Lake Spaulling Dam (Compliance Point: YB-29)						
October	10-20 ¹ /2 (+5 to 15)	20/2 (+15)	20/3 (+16)	25/4 (+22)	25/4 (+22)	30/4 (+27)
November	10-20 ¹ /2 (+5 to 15)	20/2 (+15)	20/3 (+16)	25/4 (+22)	25/4 (+22)	30/4 (+27)
December	10-20 ¹ /2 (+5 to 15)	20/2 (+15)	20/3 (+16)	25/4 (+22)	25/4 (+22)	30/4 (+27)
January	10-20 ¹ /2 (+5 to 15)	20/2 (+15)	20/3 (+16)	25/4 (+22)	25/4 (+22)	30/4 (+27)
February	10-20 ¹ /2 (+5 to 15)	25/2 (+20)	25/3 (+21)	35/4 (+32)	40/4 (+37)	50/4 (+47)
March	10-20 ¹ /2 (+5 to 15)	25/2 (+20)	30/3 (+26)	40/4 (+37)	55/4 (+52)	75/5 (+72)
April	10-20 ¹ /2 (+5 to 15)	30/2 (+25)	40/3 (+36)	60/4 (+57)	80/5 (+78)	90/5 (+88)
May	10-20 ¹ /2 (+5 to 15)	40/2 (+35)	60/3 (+56)	90/5 (+88)	90/5 (+88)	90/5 (+88)
June 1–14	10-20 ¹ /2 (+5 to 15)	35/2 (+30)	40/3 (+36)	50/4 (+47)	90/5 (+88)	90/5 (+88)

Table 2-3. Proposed Upper Drum-Spaulding Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
June 15–30	20/2 (+15)	35/2 (+30)	40/3 (+36)	50/4 (+47)	90/5 (+88)	90/5 (+88)
July	20/2 (+15)	25/2 (+20)	30/3 (+26)	35/4 (+32)	40/4 (+37)	40/4 (+37)
August	20/2 (+15)	20/2 (+15)	23/3 (+19)	25/4 (+22)	40/4 (+37)	40/4 (+37)
September 1–15	10-20 ¹ / ₂ (+5 to 15)	20/2 (+15)	23/3 (+19)	25/4 (+22)	40/4 (+37)	40/4 (+37)
September 16–30	10-20 ¹ / ₂ (+5 to 15)	20/2 (+15)	20/3 (+16)	25/4 (+22)	28/4 (+25)	30/4 (+27)
North Fork of North Fork American River – Below Lake Valley Reservoir Dam (Compliance Point: YB-104)						
October	2/3 (+1)	2/3 (+1)	3/3 (+2)	3/3 (+2)	3/3 (+2)	4/3 (+3)
November	2/3 (+1)	2/3 (+1)	3/3 (+2)	3/3 (+2)	3/3 (+2)	4/3 (+3)
December	2/3 (+1)	2/3 (+1)	3/3 (+2)	3/3 (+2)	3/3 (+2)	4/3 (+3)
January	2/3 (+1)	2/3 (+1)	3/3 (+2)	3/3 (+2)	3/3 (+2)	4/3 (+3)
February	2/3 (+1)	2/3 (+1)	3/3 (+2)	3/3 (+2)	3/3 (+2)	4/3 (+3)
March	2/3 (+1)	2/3 (+1)	3/3 (+2)	3/3 (+2)	3/3 (+2)	4/3 (+3)
April	2/3 (+1)	4/3 (+3)	4/3 (+3)	6/3 (+5)	8/3 (+7)	10/3 (+9)
May	2/3 (+1)	6/3 (+5)	6/3 (+5)	9/3 (+8)	11/3 (+10)	15/3 (+14)
June	2/3 (+1)	5/3 (+2)	5/3 (+2)	6/3 (+3)	8/3 (+5)	10/3 (+7)
July	2/3 (+1)	3/3 (+0)	3.5/3 (+0.5)	5/3 (+2)	5.5/3 (+2.5)	6/3 (+3)
August	2/3 (+1)	3/3 (+0)	3.5/3 (+0.5)	5/3 (+2)	5.5/3 (+2.5)	6/3 (+3)
September	2/3 (+1)	3/3 (+0)	3.5/3 (+0.5)	5/3 (+2)	5.5/3 (+2.5)	6/3 (+3)
North Fork of North Fork American River – Below Lake Valley Canal Diversion Dam (Compliance Point: YB-236)						
October	2.2/1 (+1.2)	2.2/1 (+1.2)	3.2/1 (+2.2)	3.5/1 (+2.5)	3.5/1 (+2.5)	4.5/1 (+3.5)



Table 2-3. Proposed Upper Drum-Spaulling Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
November	2.2/1 (+1.2)	2.2/1 (+1.2)	3.2/1 (+2.2)	3.5/1 (+2.5)	3.5/1 (+2.5)	4.5/1 (+3.5)
December	2.2/1 (+1.2)	2.2/1 (+1.2)	3.2/1 (+2.2)	3.5/1 (+2.5)	3.5/1 (+2.5)	4.5/1 (+3.5)
January	2.2/1 (+1.2)	2.2/1 (+1.2)	3.2/1 (+2.2)	3.5/1 (+2.5)	3.5/1 (+2.5)	4.5/1 (+3.5)
February	2.2/1 (+1.2)	2.2/1 (+1.2)	3.2/1 (+2.2)	3.5/1 (+2.5)	3.5/1 (+2.5)	4.5/1 (+3.5)
March	2.2/1 (+1.2)	2.2/1 (+1.2)	3.2/1 (+2.2)	3.5/1 (+2.5)	3.5/1 (+2.5)	4.5/1 (+3.5)
April	2.2/1 (+1.2)	4.2/1 (+3.2)	4.2/1 (+3.2)	6.5/1 (+5.5)	8.5/1 (+7.5)	10.5/1 (+9.5)
May	2.2/1 (+1.2)	6.2/1 (+5.2)	6.2/1 (+4.2)	9.5/1 (+8.5)	11.5/1 (+10.5)	15.5/1 (+14.5)
June	2.2/1 (+1.2)	5.2/1 (+4.2)	5.2/1 (+4.2)	6.5/1 (+5.5)	8.5/1 (+7.5)	10.5/1 (+9.5)
July	2.2/1 (+1.2)	3.2/1 (+2.2)	3.7/1 (+2.7)	5.5/1 (+4.5)	6/1 (+5)	6.5/1 (+5.5)
August	2.2/1 (+1.2)	3.2/1 (+2.2)	3.7/1 (+2.7)	5.5/1 (+4.5)	6/1 (+5)	6.5/1 (+5.5)
September	2.2/1 (+1.2)	3.2/1 (+2.2)	3.7/1 (+2.7)	5.5/1 (+4.5)	6/1 (+5)	6.5/1 (+5.5)
Bear River – At Highway 20 Crossing (Compliance Point: YB-198)						
October	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
November	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
December	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
January	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
February	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
March	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)

Table 2-3. Proposed Upper Drum-Spaulding Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
April	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)
May	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)
June	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)	13/3 (+9)
July	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)
August	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)
September	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)	8/2 (+3)
<i>Bear River – Below Drum Afterbay (Compliance Point: YB-44)</i>						
October	10/2 (+5)	10/2 (+5)	12/2 (+7)	13/2 (+8)	13/2 (+8)	13/2 (+8)
November	10/2 (+5)	10/2 (+5)	12/2 (+7)	13/2 (+8)	13/2 (+8)	13/2 (+8)
December	10/2 (+5)	10/2 (+5)	12/2 (+7)	13/2 (+8)	13/2 (+8)	13/2 (+8)
January	10/2 (+5)	10/2 (+5)	12/2 (+7)	13/2 (+8)	13/2 (+8)	13/2 (+8)
February	10/2 (+5)	10/2 (+5)	12/2 (+7)	13/2 (+8)	13/2 (+8)	13/2 (+8)
March	14/2 (+4)	14/2 (+4)	14/2 (+4)	14/2 (+4)	14/2 (+4)	14/2 (+4)
April	16/2 (+6)	16/2 (+6)	16/2 (+6)	16/2 (+6)	16/2 (+6)	16/2 (+6)
May	15/2 (+5)	15/2 (+5)	16/2 (+6)	16/2 (+6)	16/2 (+6)	16/2 (+6)
June	10/2 (+0)	10/2 (+0)	15/2 (+5)	16/2 (+6)	16/2 (+6)	16/2 (+6)
July	10/2 (+0)	10/2 (+0)	12/2 (+2)	14/2 (+4)	16/2 (+6)	16/2 (+6)
August	10/2 (+0)	10/2 (+0)	12/2 (+2)	12/2 (+2)	12/2 (+2)	15/2 (+5)
September	10/2 (+0)	10/2 (+0)	12/2 (+2)	12/2 (+2)	12/2 (+2)	15/2 (+5)
<i>Canyon Creek – Below Towle Canal Diversion Dam (Compliance Point: YB-282)</i>						
October	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)
November	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)
December	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)



Table 2-3. Proposed Upper Drum-Spaulding Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
January	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)
February	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)
March	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)	2 or NF ² /0.5 (+1.25)	2 or NF ² /0.5 (+1.25)	3 or NF ² /0.5 (+2.25)
April	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)	2 or NF ² /0.5 (+1.25)	2 or NF ² /0.5 (+1.25)	3 or NF ² /0.5 (+2.25)
May	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)	3/0.5 (+2.25)
June	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)	2/0.5 (+1.25)
July	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)
August	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)
September	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	1/0.25 (+0)	2/0.5 (+1.25)	2/0.5 (+1.25)
<i>Little Bear River – Below Alta Powerhouse Tailrace (Compliance Point: YB-98)</i>						
October	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)
November	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)
December	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)
January	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)
February	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	2/0.25 (+1.85)	3/0.25 (+2.85)	3/0.25 (+2.85)

Table 2-3. Proposed Upper Drum-Spaulding Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flows

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
March	0.5/0.25 (+0.35)	1/0.25 (+0.85)	2/0.25 (+1.85)	3/0.25 (+2.85)	4/0.25 (+3.85)	4/0.25 (+3.85)
April	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	2/0.25 (+1.85)	3/0.25 (+2.85)	3/0.25 (+2.85)
May	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	2/0.25 (+1.85)	2/0.25 (+1.85)
June	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)
July	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)
August	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)
September	0.5/0.25 (+0.35)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)	1/0.25 (+0.85)

¹ When an Extremely Critically Dry water year is preceded by an Extremely Critically Dry or Critically Dry water year, the minimum streamflow shall be 10 cfs from September 1 to June 14.

² Natural Flow or the minimum flow (depending on the water year type), whichever is greater.

According to the proposed article DS-AQR1, PG&E would be required to set the low-level outlet opening for the Proposed Upper Drum-Spaulding Project, by no later than November 1 of each year, at the following dams to make downstream flow releases ranging from 0.1 to 1 cfs:

- Texas Creek below Upper Rock Lake Dam
- Texas Creek below Lower Rock Lake Dam
- Unnamed tributary below Culbertson Lake Dam
- Lindsey Creek below Middle Lindsey Lake Dam
- Lindsey Creek below Lower Lindsey Lake Dam

- Lake Creek below Feeley Lake Dam
- Lake Creek below Carr Lake Dam
- Rucker Creek below Blue Lake Dam
- Rucker Creek below Rucker Lake Dam
- Unnamed tributary below Fuller Lake Dam
- Unnamed tributary below Meadow Lake Dam
- White Rock Creek below White Rock Diversion Dam
- Bloody Creek below Lake Sterling Dam
- Unnamed tributary below Kidd Lake Dam
- Cascade Creek below Lower Peak Lake Dam
- Sixmile Creek below Kelly Lake Dam

2.2.3.1.2 *Powerhouse Operations*

Under existing conditions and based on PG&E's Water Balance Operations Model, the Upper Drum-Spaulding Hydroelectric Project generates an annual average of 571,400 megawatt-hours (MWh). PG&E estimates the dependable capacity (i.e., amount of energy generation during the most adverse hydrologic conditions) is 136.4 MW (Table 4-2 in FERC's December 2014 FEIS).

Based on PG&E's Water Balance Operations Model, the Proposed Upper Drum-Spaulding Project would generate an annual average of 510,000 MWh, a reduction of 61,400 MWh (11 percent) from existing conditions. PG&E estimates that the dependable capacity of the Proposed Upper Drum-Spaulding Project would be 113 MW, a reduction of 23.4 MW (17 percent) from existing dependable capacity (Table 4-2 in FERC's December 2014 FEIS).

Alta Powerhouse Unit 2 was decommissioned in 2007 and the unit was left intact, but hydraulically disconnected from the penstock. It would be used for spare parts as needed for future maintenance of Unit 1. The water used through Alta Powerhouse is discharged into the tailrace,¹ where it is diverted into Placer County Water Agency's (PCWA's) Lower Boardman Canal (not part of the Proposed Projects) for domestic and irrigation use downstream by PCWA. Historically, PCWA water demand in the Lower

¹ A tailrace on a hydroelectric dam is a channel that carries water away from a hydroelectric plant or water wheel. The water in this channel has already been used to rotate turbine blades or the water wheel itself and is being released for other beneficial use.

Boardman Canal has ranged from a low of 2 cfs to a maximum of 22 cfs. Except for a few weeks during the spring runoff period, Alta Powerhouse is operated to meet PCWA's demand downstream. With the maximum capacity of one unit able to use 28 cfs, typical operation would have only one unit operating at any given time. No further construction or related costs are planned or required to officially retire Alta Powerhouse Unit 2 (e.g., it is an administrative action). Therefore, there would be no effects on the resources evaluated in this document and no further consideration is given to this action.

2.2.3.2 Construction Activities

Under the Proposed Upper Drum-Spaulding Project, PG&E would continue to operate using existing facilities described in Appendix A, *Upper Drum-Spaulding Additional Information*, with three modifications:

- modify flow-release facilities to accommodate proposed changes to flow regime;
- decommission the Jordan Creek Diversion Dam; and
- build new or expand existing recreation facilities.

Because the future flow-release facility modifications, diversion dam decommissioning, and recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis. Site and construction plans for this and other future undefined work associated with the Proposed Upper Drum-Spaulding Project will require discretionary approvals and environmental analysis prior to any construction activities.

2.2.3.3 Routine Maintenance

Currently, maintenance for the Proposed Upper Drum-Spaulding Project includes testing gates and valves at the dams and intakes throughout the year, during periods when impacts on operation of the Proposed Upper Drum-Spaulding Project can be minimized. All spill gates are operated in the spring and fall, consistent with the California Division of Safety of Dams gate operations certificates. Canal spill gates are operated at least once every three years to confirm proper function and maintain water rights, where applicable, although many are operated more frequently consistent with normal operating procedures.

PG&E typically conducts annual maintenance on the powerhouses sometime between September and November, when consumptive water and power demand is generally low. Each powerhouse is taken out of service for approximately one to two weeks on a staggered schedule. Maintenance includes inspections of equipment in the powerhouse and switchyard and may include replacing parts and calibrating

components. Annual maintenance does not typically require a reservoir drawdown, but downstream operations can be affected by certain outages.

Under the Proposed Upper-Drum Spaulding Project, PG&E would maintain the facilities in the same manner as under the current license, with a few changes to accommodate proposed environmental measures, which are described in Section 2, *Proposed Projects*.

2.2.3.3.1 *Vegetation Management*

Vegetation management is implemented within the area necessary to reduce fire hazards, to provide for adequate facility access and inspection, to protect facilities, and to provide for worker health and safety. PG&E will coordinate vegetation management with other resource efforts associated with the Proposed Projects, including implementation of other resource management plans and measures, and will consider the need to avoid or minimize disturbance to sensitive areas. For the purpose of the routine vegetation management, sensitive areas are areas with known cultural resources, areas with known special-status species, areas of sensitive habitat, such as riparian zones and wetlands, and other pre-determined areas with significant sensitive resources.

The Proposed Upper Drum-Spaulding Project will implement vegetation management as described in PG&E's *Integrated Vegetation Management Plan* (PG&E 2011). This plan provides specific actions for PG&E to follow, including consultation with appropriate resource areas when managing vegetation in the Upper Drum-Spaulding Hydroelectric Project Boundary. The *Integrated Vegetation Management Plan* discusses, in detail, how PG&E will complete vegetation management for the following categories:

- Revegetation, including areas for revegetation, planning and evaluation of revegetation sites, revegetation methods, and monitoring;
- Mechanical trimming along facilities and roads, herbicide use inside switchyards, mechanical removal along dams (required by Division of Safety of Dams), mechanical removal to maintain bare ground in recreation areas, and hazard tree removal;
- Recreation site management which may include tree stand improvement, view enhancement and removal of hazard trees, and vegetative planting needed for screening, to cover construction scars, provide shade, increase attractiveness, control erosion and to minimize noise; and
- Road maintenance including brush cutting and/or mowing of grasses and forbs.

The *Integrated Vegetation Management Plan* also addresses how vegetation management activities will occur in areas where special-status plants and/or special-status wildlife may occur. Further detail is provided for management of Valley Elderberry Longhorn Beetle potential habitat.

2.2.3.3.2 *Recreational Facilities Improvements*

The Proposed Projects will implement the *Recreational Facilities Plan* (PG&E 2011) which describes, in detail, facilities to be rehabilitated, upgraded, or newly constructed. For the purposes of this CEQA analysis the portions of the plan considered part of the Proposed Projects are those maintenance and replacement activities scheduled to occur over the term of the new license or those activities with no new ground disturbing activities. Major recreation rehabilitation or new facility construction activities do not have sufficient design details or plans to be evaluated in this CEQA document.

Activities considered in this CEQA analysis include food locker, trash (i.e., dumpster), picnic table installation or replacement, and updated recreational signage (i.e., information boards, campground signs, campsite posts, directional signs, etc.). In addition, recreation facility operation and maintenance as described in Section 3.4 of the *Recreational Facilities Plan* is included in this analysis.

2.2.3.3.3 *Road Maintenance*

The Proposed Projects include numerous roads, which are already constructed, that require continued maintenance and/or rehabilitation during the term of the new license. For the purpose of this CEQA analysis Primary Project Roads are non-general use roads, used primarily for the Proposed Projects and are located within the Upper Drum-Spaulding Hydroelectric Project Boundary (and therefore will be under FERC's jurisdiction for the Proposed Projects). PG&E, in collaboration with the Forest Service and other agencies, developed the *Transportation System Management Plan* (PG&E 2011) that describes the scope road planning, road rehabilitation, and road operation and maintenance for Primary Project Roads. Vegetation Management along roads is discussed in the *Integrated Vegetation Management Plan*.

General Access Roads are general use roads that are outside the Upper Drum-Spaulding Hydroelectric Project Boundary. If a General Access Road is located on Forest Service lands, such roads are included in a Road Maintenance Agreement (RMA) between PG&E and the Forest Service. The RMA is not jurisdictional to the FERC license and is intended to remain as a separate agreement between PG&E and Forest Service that generally addresses shared responsibilities and funding. General use roads are not included as part of this CEQA analysis because they are not part of the Upper Drum-Spaulding Hydroelectric Project.



2.2.3.4 License Articles

The Appendix A, *Upper Drum-Spaulding Additional Information*, provides a complete list of the conditions and subparts measures.

Table 2-4 lists Proposed Articles for the Proposed Upper Drum-Spaulding Project (Articles) from the FERC FEIS, which includes FERC-recommended measures, Forest Service 4(e) conditions, and PG&E measures accepted by FERC that have the potential to affect facility operations or require physical modifications at existing facilities or construction of new facilities. These Articles have been considered in this CEQA assessment of potential effects on environmental resources. The remaining Articles do not affect flow operations or facilities directly; they provide guidance on document requirements and notifications to agencies, employee training, paper reporting requirements, and other day-to-day activities.

Table 2-4. License Articles That Propose Operational or Physical Changes or Define Plans to Avoid or Minimize Operational Impacts at Upper Drum-Spaulding Facilities

Article Name	Potential for Effect or Impact Avoidance
Recreation Facilities	Proposed construction discussed in Section 2.2.3.2, <i>Construction Activities</i>
Prevention of Soil Erosion	Impact avoidance measure applicable to aquatic resources
Jordan Creek Diversion Decommissioning Plan	Proposed decommissioning as discussed in Section 2.2.3.2, <i>Construction Activities</i>
Flow Releases to the Bear River Below Drum Canal at YB-137	Proposed facilities upgrades as discussed in Section 2.2.3.2, <i>Construction Activities</i>
Bear River Management Plan Upstream of Forest Service Lands	Proposes monitoring and possible remedial actions; implementation of remedial actions would require separate permitting and CEQA evaluation
Bat Management Plan	Impact avoidance measure applicable to terrestrial resources
Canal Outages Fish Rescue Plan	Impact avoidance measure applicable to aquatic resources
Fish Population Monitoring Plan	Impact avoidance measure applicable to aquatic resources
Foothill Yellow Legged Frog Monitoring Plan	Impact avoidance measure applicable to aquatic resources
Channel Morphology Monitoring Plan	Impact avoidance measure applicable to aquatic resources

Table 2-4. License Articles That Propose Operational or Physical Changes or Define Plans to Avoid or Minimize Operational Impacts at Upper Drum-Spaulding Facilities

Article Name	Potential for Effect or Impact Avoidance
Riparian Vegetation Monitoring Plan	Impact avoidance measure applicable to aquatic resources
DS-TR5, Implement Bald Eagle Management Plan	Impact avoidance measure applicable to terrestrial resources
Programmatic Agreement and Historic Properties Management Plan	Impact avoidance measure applicable to cultural resources
Transportation System Management Plan	Impact avoidance measure applicable to transportation resources
Visual Resource Management Plan	Impact avoidance measure applicable to visual resources
Integrated Vegetation Management Plan	Impact avoidance measure applicable to terrestrial resources
Fire Prevention and Response Plan	Impact avoidance measure applicable to wildfire resources
Water Temperature and Stage Monitoring Plan	Impact avoidance measure applicable to aquatic resources
Erosion and Sediment Control Plan	Impact avoidance measure applicable to aquatic resources
Canal Release Point Plan	Impact avoidance measure applicable to aquatic resources
Gaging Plan	Impact avoidance measure applicable to aquatic resources
Water Year Types	Defines requirements for revised dam operations as discussed in Section 2.2.3.1, <i>Modifications to Operations</i>
Minimum Streamflows	Defines requirements for revised dam operations as discussed in Section 2.2.3.1, <i>Modifications to Operations</i>
Flow Settings	Defines requirements for revised dam operations as discussed in Section 2.2.3.1, <i>Modifications to Operations</i>
Canal Outages	Defines requirements for revised dam operations as discussed in Section 2.2.3.1, <i>Modifications to Operations</i>



Table 2-4. License Articles That Propose Operational or Physical Changes or Define Plans to Avoid or Minimize Operational Impacts at Upper Drum-Spaulding Facilities

Article Name	Potential for Effect or Impact Avoidance
Fordyce Lake Drawdown	Defines requirements for revised dam operations as discussed in Section 2.2.3.1, <i>Modifications to Operations</i>
Streamflow Measurement	Impact avoidance measure applicable to aquatic resources

2.3 Proposed Lower Drum Project Description

2.3.1 Location and Setting

PG&E's Lower Drum Hydroelectric Project, FERC Project No. 14531, is located on Bear River, Dry Creek, Rock Creek, Auburn Ravine, and Mormon Ravine. Facilities are located in Placer County, California. Given the dispersed nature of the facilities, the Lower Drum Hydroelectric Project does not have a single physical address. The Proposed Lower Drum Project encompasses the Lower Drum Hydroelectric Project facilities in addition to operations changes and environmental measures described below.

As part of the Proposed Lower Drum Project, PG&E proposes that the facilities boundary be amended to 696.8 acres. This is a reduction of 102.2 acres from the 799 acres previously identified as part of the existing FERC license. The change in acreage is a result of increased accuracy in defining the FERC facilities boundary, which has been made possible by new geographic mapping tools developed since the previous license was approved. If necessary, a boundary amendment would be filed with FERC by PG&E to encompass new facilities and features that would be constructed and become part of the Lower Drum Hydroelectric Project but would be outside of the current FERC boundary.

The proposed FERC boundary is 696.8 acres, with a small portion (5.3 acres) located on lands owned by the United States (that is, federal land). The federal lands include those owned and managed by the Bureau of Reclamation. All other lands on which Lower Drum Hydroelectric Project facilities are located are private, with the exception of 20.1 acres on state or county land. Figure 2-3 illustrates the general regional location of the Lower Drum Hydroelectric Project.

2.3.2 Background

The Lower Drum Hydroelectric Project facilities are located in Placer County, California, and consist of five dams and reservoirs, four powerhouses, and various water conduits, recreation facilities, and other associated facilities and structures. The Lower Drum Hydroelectric Project's dams are located on the Bear River, Dry Creek, Rock Creek, Auburn Ravine, Mormon Ravine, and associated tributaries (Figure 2-3). Capacities of the reservoirs associated with these dams range from 32 to 485 ac-ft at the five reservoirs, including: the Bear River Canal Diversion Dam on the Bear River, the Halsey Forebay (off channel), the Halsey Afterbay on Dry Creek, the Rock Creek Reservoir on Rock Creek, and the Wise Forebay (off channel) (Figure 2-3).

Draft Initial Study / Mitigated Negative Declaration
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

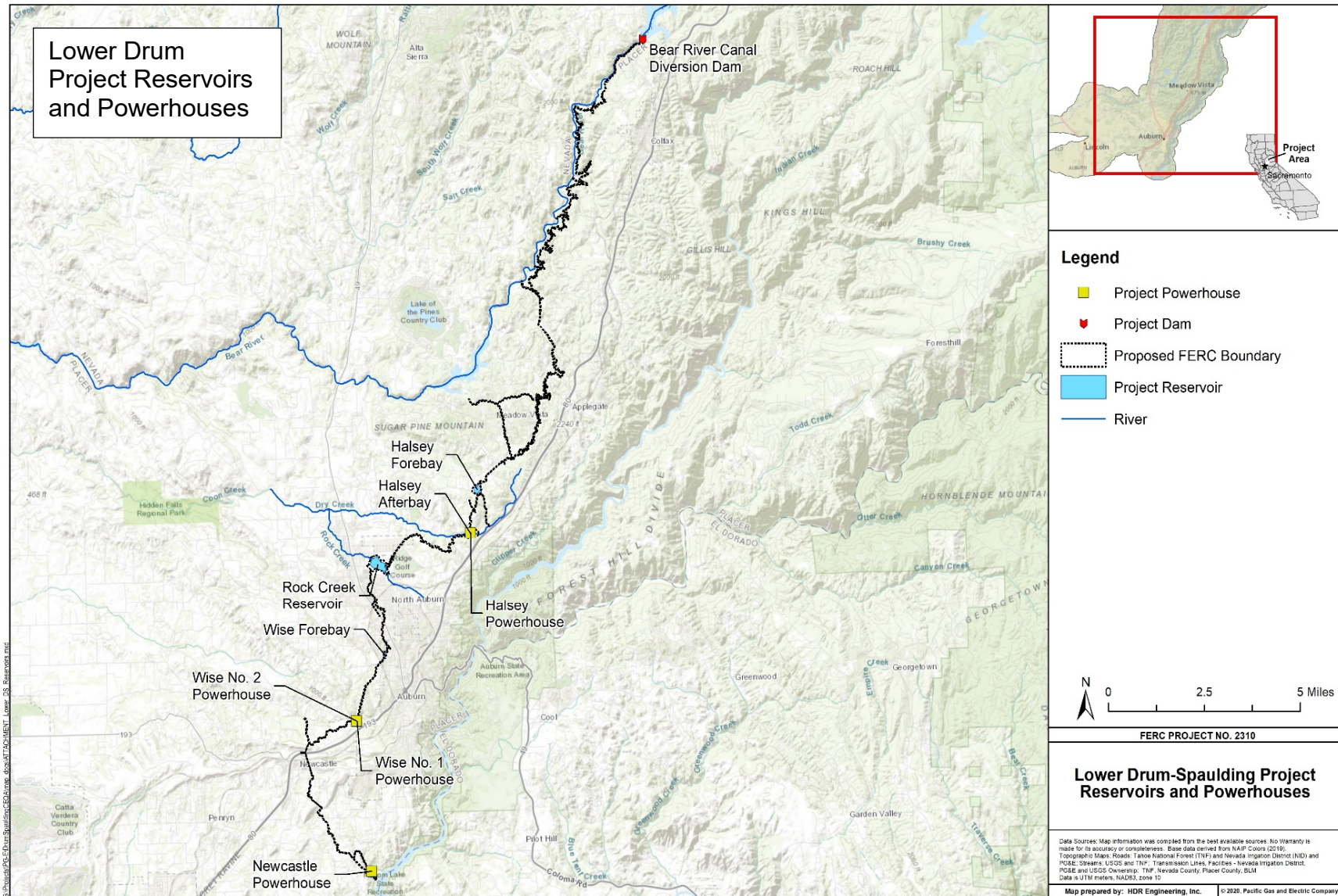


Figure 2-3. Regional Map of Lower Drum Hydroelectric Project

Lower Drum Hydroelectric Project facilities range in elevation from 1,960 ft at the Bear River Canal Diversion Dam to 435 ft at Newcastle powerhouse. The four powerhouses have a combined normal operating capacity of 39.7 MW.

Table 2-5 below presents the existing FERC license minimum streamflows (first number) and additional releases made by PG&E operators to ensure compliance with the minimum streamflow (second number), which is commonly referred to as a buffer flow. The minimum flow plus the buffer flow was used during FERC relicensing in the water operations model to define baseline conditions.

Table 2-5. Lower Drum Project Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>Dry Creek – Below Halsey Afterbay Dam (Compliance Point: YB-62A)</i>						
October	None	None	None	None	None	None
November	None	None	None	None	None	None
December	None	None	None	None	None	None
January	None	None	None	None	None	None
February	None	None	None	None	None	None
March	None	None	None	None	None	None
April	None	None	None	None	None	None
May	None	None	None	None	None	None
June	None	None	None	None	None	None
July	None	None	None	None	None	None
August	None	None	None	None	None	None
September	None	None	None	None	None	None
<i>Rock Creek – Below Rock Creek Reservoir Dam (Compliance Point: YB-86)</i>						
October	None	None	None	None	None	None
November	None	None	None	None	None	None
December	None	None	None	None	None	None
January	None	None	None	None	None	None
February	None	None	None	None	None	None



Table 2-5. Lower Drum Project Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
March	None	None	None	None	None	None
April	None	None	None	None	None	None
May	None	None	None	None	None	None
June	None	None	None	None	None	None
July	None	None	None	None	None	None
August	None	None	None	None	None	None
September	None	None	None	None	None	None
<i>Auburn Ravine – Below South Canal Release Point (Compliance Point: New Gage)</i>						
October	None	None	None	None	None	None
November	None	None	None	None	None	None
December	None	None	None	None	None	None
January	None	None	None	None	None	None
February	None	None	None	None	None	None
March	None	None	None	None	None	None
April	None	None	None	None	None	None
May	None	None	None	None	None	None
June	None	None	None	None	None	None
July	None	None	None	None	None	None
August	None	None	None	None	None	None
September	None	None	None	None	None	None
<i>Mormon Ravine (Compliance Point: YB-292)</i>						
October	5/2	5/2	5/2	5/2	5/2	5/2
November	5/2	5/2	5/2	5/2	5/2	5/2
December	5/2	5/2	5/2	5/2	5/2	5/2
January	5/2	5/2	5/2	5/2	5/2	5/2
February	5/2	5/2	5/2	5/2	5/2	5/2

Table 2-5. Lower Drum Project Baseline Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month and Water Year Type

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
March	5/2	5/2	5/2	5/2	5/2	5/2
April	5/2	5/2	5/2	5/2	5/2	5/2
May	5/2	5/2	5/2	5/2	5/2	5/2

2.3.3 Facilities

PG&E seeks, for the Proposed Lower Drum Project, to obtain a new FERC license with a total installed capacity of 39.7 MW. PG&E's proposed conditions were included in its 2011 Application for New License and subsequent amendments (PG&E 2011). FERC's recommend articles were provided in its 2014 FEIS document, which also considered recommendations from CDFW, USFWS, and other agencies (FERC 2014). The Bureau of Reclamation's final 4(e) conditions were filed with FERC on October 21, 2013. A full list of existing and proposed FERC license Articles is included in Appendix B, *Lower Drum Additional Information*. The Proposed Lower Drum Project includes four developments (i.e., facilities linked hydraulically to a common powerhouse), including Halsey, Wise, Wise No. 2, and Newcastle powerhouses. Existing facilities that would be part of the Proposed Lower Drum Project are shown in Figure 2-3 above, and descriptions of these facilities are available in Appendix B.

PG&E's proposed changes to flow release operations at dams are discussed in Section 2.3.3.1, *Modifications to Operations*. Proposed rehabilitation or expansion of existing facilities, and types of construction activities that would occur are described in Section 2.3.3.2, *Construction Activities*. PG&E's current and proposed future maintenance is described in Section 2.3.3.3, *Routine Maintenance*. Section 2.3.3.4, *License Articles*, describes the proposed Articles (i.e., terms and conditions) that FERC and others proposed be included in the new FERC license that would result in operational and/or physical modifications or additions within the Proposed Lower Drum Project area. No modifications to PG&E's water rights would be needed for the Proposed Lower Drum Project under the proposed new license.

2.3.3.1 Modifications to Operations

Operation of the Proposed Lower Drum Project would be generally consistent with existing operations. Changes in future operations are related to new and increased

minimum flow releases, and modified ramping rates, as described in Section 2.3.3.1.1, *Minimum Stream Flows*. PG&E also proposes to include in the FERC license the use of modified winter/spring operations that have been implemented since 1997.

Under PG&E's proposal, FERC authorized rating for the four units in the Proposed Lower Drum Project at 39.7 MW; there is no change in rating from existing conditions, and no physical changes to the powerhouses are proposed (see Sections 1.7 through 1.10 in Exhibit A of PG&E's Amended Application for New License). As a result of changes in flow releases, based on PG&E's Ops Model that includes historic water deliveries for 2001 through 2009, the Proposed Lower Drum Project would generate an annual average of 142,100 MWh, a reduction of 13,300 MWh (9 percent) from existing conditions. PG&E estimates the dependable capacity for the Proposed Lower Drum Project would be 23.0 MW—no change from existing conditions (Table 4-5 in FERC's December 2014 FEIS).

2.3.3.1.1 *Minimum Stream Flows*

PG&E proposes to modify operations affecting minimum streamflows, spills from canals and conduits, and the rate of flow fluctuations following spill events to provide environmental benefits to Proposed Lower Drum Project-affected aquatic resources (Table 2-6). Increased flows, reduced flow fluctuations, and cooler water temperatures that would result from flow measures proposed by PG&E and the relicensing stakeholders to enhance aquatic habitat also have the potential to affect habitat for special-status species in some reaches.

Part 1 of Article DS-AQR1, *Streamflows*, proposes, within 90 days of FERC license issuance, that PG&E would determine water year type in each of the months of February, March, April, May, and October and use this determination in implementing articles and conditions of the license (Appendix B, DS-AQR1, *Streamflows*) (PG&E 2011). Thresholds and criteria for determining water year type are also provided in this section of the proposed license.

Part 2 of proposed measure DS-AQR1 in the Final License Application specifies minimum streamflows for river reaches by month and water year type. The proposed FERC license includes six water year types, whereas the previous license categorized releases based on only two water year types (Normal and Dry).

The table below presents the proposed instream flows (first number) and the buffer flows (second number), similar to the baseline table presented above (Table 2-5). The minimum streamflows plus the buffer flows were used during FERC relicensing in the water operations model to define Proposed Lower Drum Project conditions. Buffer flows were provided by PG&E operations staff. The table also includes the net change

in flow between Proposed Lower Drum Project conditions and the baseline. This value was calculated as the proposed minimum streamflow plus the proposed buffer flow, minus the baseline minimum streamflow plus the baseline minimum flow. The net differences presented in this table show that streamflows are equal to or greater than the baseline.

Table 2-6. Proposed Lower Drum Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flow

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>Dry Creek – Below Halsey Afterbay Dam (Compliance Point: YB-62A)</i>						
October	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
November	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
December	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
January	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
February	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
March	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
April	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
May	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
June	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
July	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
August	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)
September	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)

Table 2-6. Proposed Lower Drum Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flow

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
<i>Rock Creek – Below Rock Creek Reservoir Dam (Compliance Point: YB-86)</i>						
October	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
November	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
December	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
January	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
February	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
March	3/0.25 (+3.25)	3/0.25 (+3.25)	3/0.25 (+3.25)	3/0.25 (+3.25)	3/0.25 (+3.25)	3/0.25 (+3.25)
April	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
May	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
June	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
July	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
August	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
September	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	1/0.25 (+1.25)	2/0.25 (+2.25)	3/0.25 (+3.25)
<i>Auburn Ravine – Below South Canal Release Point (Compliance Point: New Gage)</i>						
October	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
November	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
December	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)

Table 2-6. Proposed Lower Drum Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flow

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
January	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
February	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
March	2/0 (+2)	4/0 (+4)	6/0 (+6)	6/0 (+6)	13/0 (+13)	18/0 (+18)
April	2/0 (+2)	4/0 (+4)	6/0 (+6)	6/0 (+6)	13/0 (+13)	18/0 (+18)
May	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
June	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
July	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
August	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
September	2/0 (+2)	2/0 (+2)	4/0 (+4)	4/0 (+4)	4/0 (+4)	4/0 (+4)
<i>Mormon Ravine (Compliance Point: YB-292)</i>						
October	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
November	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
December	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
January	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
February	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
March	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
April	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
May	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)



Table 2-6. Proposed Lower Drum Project Minimum Streamflows/Buffer Flows in Cubic Feet Per Second for Specified Reaches, by Month, Water Year Type, and Net Change from Current Minimum Streamflow Including Buffer Flow

Month	Extreme Critically Dry Water Year	Critically Dry Water Year	Dry Water Year	Below Normal Water Year	Above Normal Water Year	Wet Water Year
June	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
July	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
August	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)
September	1 or 5 ¹ / ₁ (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)	5/2 (+0)

¹ Release would be 1 cfs if Newcastle Powerhouse is not operating; 5 cfs if Newcastle Powerhouse is operating.

Part 3 of proposed measure DS-AQR1, *Streamflows* (Appendix B)(PG&E 2011), outlines proposed requirements for setting and checking the outlet works at each dam, when PG&E is able to safely access the low-level outlets.

2.3.3.2 Construction Activities

The Proposed Lower Drum Project would include the following construction:

(1) installation of one new stream gage in Auburn Ravine and (2) construction of one new recreation facility and upgrades to one existing recreation facility. PG&E proposes to develop plans for this work when the new license is issued and obtain all necessary permits and approvals for the work prior to any ground-disturbing activities. Each of these modifications is described below. Because the future stream gage and recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis. Site and construction plans for this and other future undefined work associated with the Proposed Projects will require discretionary approvals and environmental analysis prior to any construction activities.

2.3.3.3 Routine Maintenance

Ongoing maintenance for the Proposed Lower Drum Project includes testing gates and valves at the dams and intakes throughout the year, when impacts on operation can be

minimized. All spill gates are operated in the spring and fall, consistent with the California Division of Safety of Dams gate operations certificates. Canal spill gates are operated at least once every three years to perfect prescriptive spill rights where applicable; many are operated more frequently consistent with normal operating procedures.

PG&E typically conducts annual maintenance on the powerhouses during the fall (September through November), when consumptive water and power demand is generally low. Each powerhouse is taken out of service for approximately one to two weeks on a staggered schedule. Maintenance includes inspections of equipment in the powerhouse and switchyard and may include replacing parts, calibrating components, etc. Annual maintenance does not typically require a reservoir drawdown, but downstream operations can be affected by certain outages.

The Proposed Lower Drum Project's spillways (Halsey Forebay and Afterbay, Rock Creek Reservoir, and Wise Forebay) are generally accessible year-round and are visited multiple times per week.

PG&E would maintain the Proposed Lower Drum Project facilities in the same manner as is done currently, with a few changes related to proposed environmental measures, which are described in Section 3, *Environmental Checklist Form*.

2.3.3.3.1 *Vegetation Management*

Vegetation management is implemented within the area necessary to reduce fire hazards, to provide for adequate facility access and inspection, to protect facilities, and to provide for worker health and safety. PG&E will coordinate vegetation management with other resource efforts associated with the Proposed Projects, including implementation of other resource management plans and measures, and will consider the need to avoid or minimize disturbance to sensitive areas. For the purpose of the routine vegetation management, sensitive areas are areas with known cultural resources, areas with known special-status species, areas of sensitive habitat, such as riparian zones and wetlands, and other pre-determined areas with significant sensitive resources.

The Proposed Projects will implement vegetation management as described in PG&E's *Integrated Vegetation Management Plan* (PG&E 2011). The plan provides specific actions for PG&E to follow, including consultation with appropriate resource areas when managing vegetation in the Lower Drum Hydroelectric Project Boundary. This plan discusses, in detail, how PG&E will complete vegetation management for the following categories:



- Revegetation, including areas for revegetation, planning and evaluation of revegetation sites, revegetation methods, and monitoring;
- Mechanical trimming along facilities and roads, herbicide use inside switchyards, mechanical removal along dams (required by Division of Safety of Dams), mechanical removal to maintain bare ground in recreation areas, and hazard tree removal;
- Recreation site management which may include tree stand improvement, view enhancement and removal of hazard trees, and vegetative planting needed for screening, to cover construction scars, provide shade, increase attractiveness, control erosion and to minimize noise; and
- Road maintenance including brush cutting and/or mowing of grasses and forbs.

The *Integrated Vegetation Management Plan* also addresses how vegetation management activities will occur in areas where special-status plants and/or special-status wildlife may occur. Further detail is provided for management of Valley Elderberry Longhorn Beetle potential habitat.

2.3.3.3.2 *Recreational Facilities Improvements*

The Proposed Projects will implement the *Recreational Facilities Plan* (PG&E 2011) which describes, in detail, facilities to be rehabilitated, upgraded, or newly constructed. For the purposes of this CEQA analysis the portions of this plan considered part of the Proposed Projects are those maintenance and replacement activities scheduled to occur over the term of the new license or those activities with no new ground disturbing activities. Major recreation rehabilitation or new facility construction activities do not have sufficient design details or plans to be evaluated in this CEQA document.

Activities considered in this CEQA analysis include food locker, trash (i.e., dumpster), picnic table installation or replacement, and updated recreational signage (i.e., information boards, campground signs, campsite posts, directional signs, etc.). In addition, recreation facility operation and maintenance as described in Section 3.4 of the *Recreational Facilities Plan* is included in this analysis.

2.3.3.3.3 *Road Maintenance*

The Proposed Projects include numerous roads, which are already constructed, that require continued maintenance and/or rehabilitation during the term of the new license. For the purpose of this CEQA analysis Primary Project Roads are non-general use roads, used primarily for the Proposed Projects and are located within the Lower Drum Hydroelectric Project Boundary (and therefore will be under FERC's jurisdiction for the

Proposed Projects). PG&E, in collaboration with the Forest Service and other agencies, developed the *Transportation System Management Plan* (PG&E 2011) that describes the scope road planning, road rehabilitation, and road operation and maintenance for Primary Project Roads. Vegetation Management along roads is discussed in the *Integrated Vegetation Management Plan*.

General Access Roads are general use roads that are outside the Lower Drum Hydroelectric Project Boundary. If a General Access Road is located on Forest Service lands, such roads are included in a RMA between PG&E and the Forest Service. The RMA is not jurisdictional to the FERC license and is intended to remain as a separate agreement between PG&E and the Forest Service that generally addresses shared responsibilities and funding. General use roads are not included as part of this CEQA analysis because they are not part of the Lower Drum Hydroelectric Project.

2.3.3.4 License Articles

Appendix B, *Lower Drum Additional Information*, provides a complete list of the conditions and subparts measures.

Table 2-7 lists Proposed Articles for the Lower Drum Hydroelectric Project (Articles) from the FERC FEIS, which includes FERC-recommended measures, Bureau of Reclamation 4(e) conditions, and PG&E measures accepted by FERC that have the potential to affect facility operations or require physical modifications at existing facilities or construction of new facilities. These Articles have been considered in this CEQA assessment of potential effects on environmental resources. The remaining Articles do not affect flow operations or facilities directly; they provide guidance on document requirements and notifications to agencies, employee training, paper reporting requirements, and other day-to-day activities.

Table 2-7. FERC License Articles That Propose Operational or Physical Changes or Define Plans to Avoid or Minimize Operational Impacts at Facilities

Article Name	Potential for Effect or Impact Avoidance
Recreation Facilities	Proposed construction discussed in Section 2.3.3.2, <i>Construction Activities</i>
Prevention of Soil Erosion	Impact avoidance measure applicable to aquatic resources
Bear River Management Plan Upstream of Forest Service Lands	Proposes monitoring and possible remedial actions; implementation of remedial actions would require separate permitting and CEQA evaluation



Table 2-7. FERC License Articles That Propose Operational or Physical Changes or Define Plans to Avoid or Minimize Operational Impacts at Facilities

Article Name	Potential for Effect or Impact Avoidance
Bat Management Plan	Impact avoidance measure applicable to terrestrial resources
Canal Outages Fish Rescue Plan	Impact avoidance measure applicable to aquatic resources
Fish Population Monitoring Plan	Impact avoidance measure applicable to aquatic resources
Riparian Vegetation Monitoring Plan	Impact avoidance measure applicable to aquatic resources
Programmatic Agreement and Historic Properties Management Plan	Impact avoidance measure applicable to cultural resources
Transportation System Management Plan	Impact avoidance measure applicable to transportation resources
Visual Resource Management Plan	Impact avoidance measure applicable to visual resources
Integrated Vegetation Management Plan	Impact avoidance measure applicable to terrestrial resources
Fire Prevention and Response Plan	Impact avoidance measure applicable to wildfire resources
Water Temperature and Stage Monitoring Plan	Impact avoidance measure applicable to aquatic resources
Erosion and Sediment Control Plan	Impact avoidance measure applicable to aquatic resources
Canal Release Point Plan	Impact avoidance measure applicable to aquatic resources
Gaging Plan	Impact avoidance measure applicable to aquatic resources
Water Year Types	Defines requirements for revised dam operations as discussed in Section 2.3.3.1, <i>Modifications to Operations</i>
Minimum Streamflows	Defines requirements for revised dam operations as discussed in Section 2.3.3.1, <i>Modifications to Operations</i>

Table 2-7. FERC License Articles That Propose Operational or Physical Changes or Define Plans to Avoid or Minimize Operational Impacts at Facilities

Article Name	Potential for Effect or Impact Avoidance
Flow Settings	Defines requirements for revised dam operations as discussed in Section 2.3.3.1, <i>Modifications to Operations</i>
Canal Outages	Defines requirements for revised dam operations as discussed in Section 2.3.3.1, <i>Modifications to Operations</i>
Streamflow Measurement	Impact avoidance measure applicable to aquatic resources
Wildlife Crossings – Bear River and South Canals	Impact avoidance measure USFWS No. 42 for wildlife resources

2.4 References

- Federal Energy Regulatory Commission (FERC). 2014. Final Environmental Impact Statement for Hydropower License. Accessed November 12, 2020.
https://elibrary.ferc.gov/eLibrary/filelist?document_id=14283202&optimized=false
- Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020.
<http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.

3 Environmental Checklist Form

1. Project Title: Proposed Upper Drum-Spaulding Hydroelectric Project and Proposed Lower Drum Hydroelectric Project
2. Lead Agency name: California State Water Resources Control Board
3. Contact person and phone number: Jordan Smith, (916) 323-3645
4. Project location: The Proposed Upper Drum-Spaulding Project would use existing facilities and be located in Nevada and Placer Counties, California, on the South Yuba River, Bear River, and North Fork of the North Fork American River. The Proposed Lower Drum Project is located on Bear River, Dry Creek, Rock Creek, Auburn Ravine, and Mormon Ravine. Proposed Lower Drum Project facilities are located in Placer County, California. Given the dispersed nature of the facilities, the Proposed Projects do not have a single physical address.
5. General Plan designation: Land uses in the vicinity of the Proposed Projects include general agriculture, residential agriculture, forest, residential forest, forest recreation, public, open space, recreation, resort, and timberland production zones.
6. Zoning: The Nevada County zoning ordinance identifies 31 land use categories, 7 of which apply in the vicinity of the Proposed Projects: general agriculture, residential agriculture, forest, timberland production zone, open space, public, and recreation. The Placer County zoning ordinance provides 22 land use categories, 6 of which are pertinent to the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project area: agricultural exclusive, farm, forestry, open space, timber production, and water influence.
7. Description of project: Obtain new FERC licenses for the Proposed Projects, which at a minimum will include FERC articles from the 2014 FEIS, Forest Service and Bureau of Reclamation 4(e) conditions, measures proposed by PG&E in its Application for New License and accepted by FERC in the FEIS, and all appropriate conditions of the State Water Board's water quality certification for the protection of water quality. Operation of the Proposed Upper Drum-Spaulding Project would be generally consistent with existing operations and routine maintenance; however, changes to minimum flows at identified reaches and ramping rates have been included. Operation of the Proposed Lower Drum Project would be generally consistent with existing operations and routine maintenance; however, changes to minimum flows at identified reaches and ramping rates have been included.

8. Surrounding land uses and setting: The Proposed Projects are located in the Sierra Nevada Range and contain forested foothills, rivers, reservoirs, and steep terrain.
9. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement): FERC – issuing Licenses; and State Water Board – issuing Clean Water Act Section 401 Water Quality Certification. Other future undefined work associated with the Proposed Projects will require discretionary approvals and environmental analysis prior to any construction activities.
10. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.? The State Water Board has notified tribes who have expressed interest to PG&E regarding the Proposed Projects.



Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Unless Mitigation Incorporated” as indicated by the checklist on the following pages.

<input type="checkbox"/> Aesthetics	<input type="checkbox"/> Agriculture and Forestry Resources	<input type="checkbox"/> Air Quality
<input checked="" type="checkbox"/> Biological Resources	<input type="checkbox"/> Cultural Resources	<input type="checkbox"/> Energy
<input checked="" type="checkbox"/> Geology/Soils	<input type="checkbox"/> Greenhouse Gas Emissions	<input type="checkbox"/> Hazards & Hazardous Materials
<input type="checkbox"/> Hydrology / Water Quality	<input type="checkbox"/> Land Use/Planning	<input type="checkbox"/> Mineral Resources
<input type="checkbox"/> Noise	<input type="checkbox"/> Population/Housing	<input type="checkbox"/> Public Services
<input checked="" type="checkbox"/> Recreation	<input type="checkbox"/> Transportation	<input checked="" type="checkbox"/> Tribal Cultural Resources
<input type="checkbox"/> Utilities/Service Systems	<input type="checkbox"/> Wildfire	<input checked="" type="checkbox"/> Mandatory Findings of Significance

Determination (To be Completed by the Lead Agency)

On the basis of this initial evaluation:

- ☐ I find that the Proposed Projects would not have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the Proposed Projects could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the Proposed Projects may have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the Proposed Projects may have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the Proposed Projects could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Projects, nothing further is required.

Signature

Date:



Evaluation of Environmental Impacts

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors, as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. (CEQA Guidelines, § 15063, subd. (c)(3)(D).) In this case, a brief discussion should identify the following:
 - a. Earlier Analysis Used. Identify and state where they are available for review.
 - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

- c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
 7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
 8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
 9. The explanation of each issue should identify:
 - a. The significance criteria or threshold, if any, used to evaluate each question; and
 - b. The mitigation measure identified, if any, to reduce the impact to less than significance.



3.1 Aesthetics

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Except as provided in Public Resources Code Section 21099, would the project:</i>				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building 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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>

3.1.1 Environmental Setting

The Proposed Projects are located in the northern Sierra Nevada and Sierra Nevada foothills, which generally provide a wooded, natural, scenic backdrop. The main exceptions to the characterization of the landscape as natural are the reservoirs, powerhouses, and canals in the vicinity of the Proposed Projects. The Proposed Upper

Drum-Spaulding Project area and Proposed Lower Drum Project area are remote and rural and contain only a limited number of residential and/or commercial areas.

3.1.1.1 Proposed Upper Drum-Spaulding Project

The Proposed Upper Drum-Spaulding Project is located in Nevada and Placer Counties in California on lands managed by the Forest Service as part of the Tahoe National Forest. All other lands within the Proposed Upper Drum-Spaulding Project area are owned by private entities, including PG&E or other private landowners. Scenic views in the Proposed Upper Drum-Spaulding Project area include mountain peaks and the gorge of the South Fork of the Yuba River. The South Yuba River also adds to the visual quality of the Proposed Upper Drum-Spaulding Project area because it is designated as a California Wild and Scenic River.

Interstate 80 is an eligible state scenic highway in the Proposed Upper Drum-Spaulding Project area between Yuba Gap and State Route 20. State Route 20 is an eligible state scenic highway in the Proposed Upper Drum-Spaulding Project area between Interstate 80 and State Route 49 in Nevada City. A portion of State Route 20 from Skillman Flat Campground to one-half mile east of Lowell Hill Road (6 miles) is designated an official state scenic highway.

The following plans contain guidelines or policies related to scenic vistas and visual quality for the Proposed Upper Drum-Spaulding Project area:

- *Tahoe National Forest Land and Resources Management Plan* (LRMP) (Tahoe National Forest 1990)
- *Placer County General Plan* (Placer County 2013)
- *Nevada County General Plan* (Nevada County 1996)

The Forest Service provides preferred Visual Quality Objectives (VQOs) for its lands managed under the Tahoe National Forest LRMP. These VQOs are established to restrict visually disruptive land management actions within viewsheds that are important to the public, while allowing for more intensive land management on lands that are visually less sensitive. Land that is part of the Proposed Upper Drum-Spaulding Project and is within the Tahoe National Forest is currently classified as either Retention or Partial Retention (Forest Service 1990). 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. Under these VQOs, management activities, when viewed by the public, should have an intact natural or natural-looking character. 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 area's natural character. In addition, the Yuba–Donner Scenic Byway, a 175-mile National Forest Scenic Byway through the Tahoe National Forest, crosses the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas along the following routes: Interstate 80 between Emigrant Gap and Truckee and State Route 20 between Nevada City and Emigrant Gap/Interstate 80. According to the LRMP, visual quality for the foreground and middle ground of a view are to be retained from State Route 20. Parts of the Proposed Upper Drum-Spaulding Project outside of the boundary of the Tahoe National Forest do not have identified VQOs.

The *Visual Resource Management Plan* (PG&E 2011) that was prepared during the FERC relicensing process includes additional details regarding the visual environment of the Proposed Upper Drum-Spaulding Project. Section 3.16, *Recreation*, and the *Recreational Facilities Plan* (PG&E 2011) include additional information regarding the recreational resources in the Proposed Upper Drum-Spaulding Project and provide additional visual context.

3.1.1.2 Proposed Lower Drum Project

The Proposed Lower Drum Project is located in Placer County, California. A small portion (5.3 acres) of the Proposed Lower Drum Project is located on lands owned and managed by the Bureau of Reclamation, while 20.1 acres are located on state or county land. All other lands within the Proposed Lower Drum Project are owned by private entities, including PG&E or other private landowners.

State Route 49 is an eligible state scenic highway in the Proposed Lower Drum Project area in the vicinity of the city of Auburn (Caltrans 2020).

The following plans contain guidelines or policies related to scenic vistas and visual quality for the Proposed Lower Drum Project area:

- Tahoe National Forest LRMP
- *Bureau of Reclamation Sierra Resource Management Plan*
- *Placer County General Plan*

Section 3.16, *Recreation*, and the *Recreational Facilities Plan* (PG&E 2011), include additional information regarding the recreational resources in the Proposed Lower Drum Project area and provide additional visual context.

3.1.2 Impact Analysis

a) Have a substantial adverse effect on a scenic vista?

No impact.

Proposed modifications to operation and routine maintenance of the Proposed Projects would include some minor ground-disturbing activities, which may result in the removal of vegetation, including trees, but would generally be consistent with existing operations and would not have a substantial adverse effect on a scenic vista. The Proposed Projects are located within the Tahoe National Forest; therefore, any vegetation removal planned on lands within the Tahoe National Forest would be coordinated with the Forest Service and would not result in a substantial adverse effect on a scenic vista. Within the Proposed Projects, changes in flows in the Bear River or South Yuba River would not noticeably alter the existing visual environment and, therefore, would not affect any scenic vistas along the rivers.

Changes in future operations for both the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would be related to new and increased minimum flow releases and modified ramping rates and, therefore, would not result in a substantial adverse effect on a scenic vista. As a result, the Proposed Projects would not have a substantial adverse effect on a scenic vista.

No impact would occur, and no mitigation is required.

Mitigation Measures: None required.

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

No impact.

State Route 20 and Interstate 80 are eligible state scenic highways in the Proposed Upper Drum-Spaulding Project area, while State Route 49 is an eligible state scenic highway in the Proposed Lower Drum Project area. Proposed modifications to operations and routine maintenance associated with the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are not located within or adjacent to either of these eligible routes. Therefore, the Proposed Projects would not substantially damage scenic resources, such as trees, rock outcroppings, or historic buildings within eligible viewsheds of State Route 20, Interstate 80, or State Route 49. As a result, no impact would occur, and no mitigation is required.



Mitigation Measures: None required.

- c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and surroundings? (Public views are those that are experiences 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?***

No impact.

Modifications to operations and routine maintenance activities within the Proposed Projects would be consistent with the existing visual setting surrounding these facilities and would not substantially degrade the visual character for public viewers. In addition, operations and maintenance activities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, which are located on Tahoe National Forest lands, would be consistent with the VQOs outlined in the Tahoe National Forest LRMP and would undergo future visual review in consultation with FERC and the Forest Service, as described in the *Visual Resource Management Plan* (PG&E 2011).

The proposed flow release modifications and operations and maintenance of existing facilities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would not constitute a change to the visual setting. Therefore, the Proposed Projects would not substantially degrade the existing visual character or quality of public views in their respective areas or their surroundings. As a result, no impact would occur, and no mitigation is required.

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?***

No impact.

The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would not include any new sources of lighting. As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

3.1.3 References

California Department of Transportation (Caltrans). 2020. "California Scenic Highway Mapping System." Accessed February 2020.
<https://www.placer.ca.gov/DocumentCenter/View/8261/Caltrans-2011-Scenic-Highways-PDF>.

Draft Initial Study / Mitigated Negative Declaration
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Nevada County. 1996. "General Plan." Last Updated 2014. Accessed February 27, 2020. <https://www.mynevadacounty.com/1065/General-Plan>.

Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020. <http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.

Placer County. 2013. "General Plan." Accessed February 27, 2020. <https://www.placer.ca.gov/2977/Placer-County-General-Plan>.

Tahoe National Forest. 1990. "Tahoe National Forest Land and Resource Management Plan." Accessed February 27, 2020. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5214243.pdf.

U.S. Department of Agriculture (USDA), Forest Service. 1990. "Tahoe National Forest Land and Resource Management Plan." USDA Forest Service, Pacific Southwest Region, San Francisco. Accessed February 27, 2020. www.fs.fed.us/r5/rsl/clearinghouse/gis-download.shtml.



3.2 Agriculture and Forestry Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<p><i>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) prepared by the California Department of Conservation 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 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.</i></p> <p><i>Would the project:</i></p>				
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"/>

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless 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 by 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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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"/>

3.2.1 Environmental Setting

3.2.1.1 Proposed Upper Drum-Spaulding Project

The Proposed Upper Drum-Spaulding Project area is located in Nevada and Placer Counties, California. The Proposed Upper Drum-Spaulding Project includes activities corresponding to FERC relicensing at five existing developments: Spaulding No. 3, Spaulding No. 1 and No. 2, Alta, Drum No. 1 and No. 2, and Dutch Flat No. 1. The Proposed Upper Drum-Spaulding Project area encompasses the facilities and features included in the existing developments, as well as access roads and other lands necessary for recreation, shoreline management, and the protection of environmental resources.



The revised Upper Drum-Spaulding Hydroelectric Project Boundary encompasses National Forest lands managed by the Forest Service and USDA as part of the Tahoe National Forest and lands managed by the Bureau of Land Management (BLM). All other lands within the Upper Drum-Spaulding Hydroelectric Project Boundary are owned by NID or are privately owned by PG&E or other landowners. The revised Upper Drum-Spaulding Hydroelectric Project Boundary would encompass all features and lands necessary for PG&E to operate and maintain the Upper Drum-Spaulding Hydroelectric Project.

Nearly 28 percent of terrestrial habitat within the Proposed Upper Drum-Spaulding Project is occupied by forested habitat types that include Jeffrey pine, lodgepole pine, montane hardwood, montane hardwood-conifer, Ponderosa pine, red fir, Sierran mixed conifer, and white fir. Nearly 15 percent of Placer County and 15 percent of Nevada County are zoned for timber production. Of these areas, approximately 14 percent of the total Proposed Upper Drum-Spaulding Project area falls within an area zoned for timber production. Additionally, nine percent of PG&E lands within the Proposed Upper Drum-Spaulding Project area are zoned or used for timber production.

Approximately 29 percent of Placer County and 37 percent of Nevada County are zoned for agriculture or farming. Approximately 33 percent of the Proposed Upper Drum-Spaulding Project area falls within areas zoned for open space within the two counties, but not necessarily agriculture exclusive areas. Overall, the Proposed Upper Drum-Spaulding Project area is not suitable for agricultural use because of steep topography, dense forests, poor soils, and limited access. No important farmlands used for cultivation or grazing are located in the vicinity of the Proposed Upper Drum-Spaulding Project area.

3.2.1.2 Proposed Lower Drum Project

The Proposed Lower Drum Project area is located in Placer County, California. More than 50 percent of terrestrial habitat within the Proposed Lower Drum Project area is occupied by forested habitat types that include blue oak-foothill pine, blue oak woodland, Douglas fir, montane hardwood, montane hardwood-conifer, ponderosa pine, Sierran mixed conifer, and valley oak woodland. Nearly 15 percent of Placer County is zoned for timber production. Of this, only approximately 0.05 percent of the total Proposed Lower Drum Project area falls within an area zoned for timber production. The 0.05 percent of the Proposed Lower Drum Project area that does fall within a timber production zone is not owned by PG&E. No PG&E lands within the Proposed Lower Drum Project area are zoned or used for timber production.

Approximately 29 percent of Placer County is zoned for agriculture or farming. Approximately 82 percent of the Proposed Lower Drum Project area falls within areas zoned for open space, farmland, or residential within Placer County.

3.2.2 Impact Analysis

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?

No impact.

No lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance are found in the Proposed Upper Drum-Spaulding Project area (California Department of Conservation [DOC] 2016, 2018).

Within the Proposed Lower Drum Project area, one small area near the intersection of Auburn Folsom Road and Paddock Lane along a canal is designated as Prime Farmland and Farmland of Local Importance (DOC 2016). However, none of the proposed modifications or operations and maintenance activities within the Proposed Lower Drum Project area would convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use.

Therefore, the proposed activities/actions included in the Proposed Projects would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No impact.

None of the lands within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are listed under an existing Williamson Act contract (DOC 2010, 2016). Additionally, the Proposed Projects are confined to existing facilities and features in the Upper Drum-Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project Boundary, none of which are zoned for agriculture. Therefore, the Proposed Projects would not conflict with an existing area zoned for agriculture or a Williamson Act contract. As a result, no impact would occur, and no mitigation is required.

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 by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No impact.

Some of the lands within and surrounding the Proposed Upper Drum-Spaulding Project area are zoned for timber production and open space. Additionally, some of the federal lands in the Proposed Upper Drum-Spaulding Project area are managed for timber resources by the Tahoe National Forest. The proposed modifications and operation and maintenance of existing recreational facilities would include some ground-disturbing activities, which may result in the removal of vegetation, including trees. However, the effects on forest lands would be minimal and no rezoning would be required. Any vegetation removal planned on lands within the Tahoe National Forest would be coordinated with the Forest Service. Other Proposed Upper Drum-Spaulding Project activities, including flow release modifications and the retirement of the Alta Powerhouse Unit 2, would not result in the rezoning of forest land, although some vegetation trimming may be necessary near other facilities for maintenance.

Activities and actions included in the Proposed Lower Drum Project area would not conflict with the existing zoning for forest lands or those lands zoned as a Timber Production Zone since proposed operation and maintenance of the Proposed Lower Drum Project would generally be consistent with existing operations.

Consequently, no forest land, timberland, or timberland zoned Timberland Production that is within the Proposed Upper Drum-Spaulding Project or the Proposed Lower Drum Project areas and vicinity would be affected by the Proposed Projects. Therefore, the Proposed Projects would not conflict with the existing zoning or cause rezoning of these uses. As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

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

No impact.

As mentioned in the response to item c, no forest land within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would be affected by activities associated with the Proposed Projects. Therefore, no forest land would be converted to a non-forest use. As a result, no impact would occur, and no mitigation is required.

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?

No impact.

See responses to items a, b, c, and d above. Activities associated with the Proposed Projects would be limited to routine maintenance and operations of existing facilities. Implementation of the proposed modifications and management plans would not result in the conversion of farmland to non-agricultural use or forest land to non-forest use. No other changes in the existing environment as a result of the Proposed Projects would lead to the conversion of farmland or forest land. Therefore, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

3.2.3 References

- California Department of Conservation (DOC). 2010. "California Land Conservation (Williamson) Act." Accessed February 25, 2020.
https://www.conservation.ca.gov/dlrp/wa/Documents/stats_reports/2010%20Williamson%20Act%20Status%20Report.pdf.
- . 2016. "Farmland Mapping & Monitoring Program." Placer County. Sacramento, California. Last updated 2018. Accessed January 7, 2020.
<https://www.conservation.ca.gov/dlrp/fmmp/>.
- . 2018. "Farmland Mapping & Monitoring Program." Nevada County. Sacramento, California. Last updated 2018. Accessed January 7, 2020.
<https://www.conservation.ca.gov/dlrp/fmmp/>.



3.3 Air Quality

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.</i>				
<i>Would the project:</i>				
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"/>

3.3.1 Environmental Setting

The Proposed Upper Drum-Spaulding Project area is located in Placer and Nevada Counties, while the Proposed Lower Drum Project area is located in Placer County. Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project facilities within Placer County are within the Placer County Air Pollution Control District (PCAPCD), while facilities within Nevada County are within the Northern Sierra Air Quality Management District (NSAQMD).

Table 3-1 presents the attainment status of Nevada and Placer Counties relative to federal and state ambient air quality standards.

Table 3-1. Ambient Air Quality Attainment Status Setting

Pollutant	Nevada County	Placer County
Federal 8-hour ozone	Nonattainment	Nonattainment
Federal PM ₁₀	Nonattainment	Nonattainment
Federal PM _{2.5}	Unclassified/Attainment	Unclassified/Attainment
Federal CO	Unclassified/Attainment	Unclassified/Attainment
State ozone	Nonattainment	Nonattainment
State PM ₁₀	Unclassified/Attainment	Unclassified/Attainment
State PM _{2.5}	Unclassified/Attainment	Unclassified/Attainment
State CO	Unclassified/Attainment	Unclassified/Attainment

Source: Area Designations Maps/State and National,
<http://www.arb.ca.gov/desig/adm/adm.htm>, accessed February 9, 2020.

Notes: Unclassified/Attainment: lacks sufficient monitoring data to demonstrate attainment but is assumed attainment.

CO = carbon monoxide, PM₁₀ = particulate matter 10 micrometers or less in diameter,
 PM_{2.5} = particulate matter 2.5 micrometers or less in diameter

Both PCAPCD and NSAQMD have published CEQA guidance documents listing significance thresholds for construction projects. Construction projects with estimated emissions above significance thresholds are not prohibited, but where estimated emissions exceed significance thresholds, mitigation measures must be applied to the construction project to limit emissions to the extent practicable. Table 3-2 and Table 3-3 present the construction project CEQA significance thresholds for PCAPCD and NSAQMD, respectively.

Table 3-2. PCAPCD Thresholds of Significance

	NO_x (lb/day)	ROG (lb/day)	PM₁₀ (lb/day)	PM_{2.5} (lb/day)	CO (lb/day)
Construction or operations	82	82	82	Not established	Not established
Operational phase	55	55	82	Not established	Not established

Source: PCAPCD CEQA Handbook, 2017, <https://www.placerair.org/1801/CEQA-Handbook>

Notes: lb = pound, MT/yr = metric ton per year carbon dioxide equivalent, NO_x = nitrogen oxide, PM₁₀ = particulate matter 10 micrometers or less in diameter, PM_{2.5} = particulate matter 2.5 micrometers or less in diameter, ROG = reactive organic gas, CO = carbon monoxide

Table 3-3. NSAQMD Thresholds of Significance

Level	NO_x (lb/day)	ROG (lb/day)	PM₁₀ (lb/day)	PM_{2.5} (lb/day)	CO (lb/day)
Level A – Less than Significant	<24	<24	<79	Not established	Not established
Level B – Potentially Significant	24–136	24–136	79–136	Not established	Not established
Level C – Mitigation Required	>136	>136	>136	Not established	Not established

Source: Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects, 2007,

<https://www.mynevadacounty.com/DocumentCenter/View/15130/NSAQMD-Land-Use-Guidelines-PDF>

Notes: lb = pound, NO_x = nitrogen oxide, PM₁₀ = particulate matter 10 micrometers or less in diameter, PM_{2.5} = particulate matter 2.5 micrometers or less in diameter, ROG = reactive organic gas, CO = carbon monoxide

The NSAQMD guidance document suggests three tiers of construction mitigation measures corresponding to the three ranges of estimated emissions in the table above.

3.3.2 Impact Analysis

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

Less than significant impact.

As shown in Table 3-2 and Table 3-3, respectively, PCAPCD and NSAQMD have prepared CEQA guidance manuals that set forth significance thresholds, below which a

project may be safely assumed to conform to the relevant air quality plan for this area. The Proposed Projects 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 high-ROG architectural coatings or solvents during operations and maintenance activities. The Proposed Projects would not include any major construction activities that would exceed air quality significance thresholds. Further, the Proposed Projects would not negligibly increase the service capacity of recreational areas or other facilities, and a negligible increase in vehicle trips during operations would be anticipated. Therefore, the Proposed Projects would not conflict with or obstruct implementation of applicable air quality plans. As a result, the Proposed Projects would have a less than significant impact and no mitigation is required.

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?

Less than significant impact.

As mentioned above in item a, the PCAPCD and NSAQMD have developed thresholds of significance that focus on quantifying and reducing emissions from both minor maintenance work and 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 PCAPCD and NSAQMD.

Routine maintenance activities and operational emissions for the Proposed Projects would be below the established significance thresholds.

Therefore, the Proposed Projects' incremental contribution to criteria pollutant emissions is not cumulatively considerable. The Proposed Projects would have a less than significant impact and no mitigation is required.

Mitigation Measures: None required.

c) Expose sensitive receptors to substantial pollutant concentrations?

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, day care centers, hospitals, convalescent homes, residences of sensitive persons, and parks with active recreational uses, such as youth sports. Given the remote locations of the Proposed Projects and forest recreation land uses of the Proposed Projects, there are no characteristic sensitive receptors that would be affected by construction activities. Furthermore, since all routine maintenance activities would be short-term (days) compared with long-term exposure criteria (years), no significant exposures to engine exhaust or fugitive dust would occur. Therefore, the Proposed Projects would not result in exposure of sensitive receptors to substantial pollutant concentrations. As a result, there is no impact and no mitigation is required.

Mitigation Measures: None required.

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

No impact.

The Proposed Projects do not include any land uses (for example, livestock operations, refineries, wastewater treatment plants, landfills) that would generate any substantial amounts of long-term, odorous emissions. Short-term routine maintenance activities would generate odors during maintenance vehicle or equipment operation. However, given the remote location of the Proposed Projects, the short duration of maintenance activities, and minimal pieces of equipment used combined with existing diesel fuel standards that limit the amount of sulfur in fuel to 15 parts per million, no significant amount of odors is anticipated from routine maintenance or ongoing operational activities associated with the Proposed Projects. Therefore, there would be no adverse effects on a substantial number of people within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. As a result, the Proposed Projects would have no impact and no mitigation is required.

Mitigation Measures: None required.

3.4 Biological Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 checked="" type="checkbox"/>	<input 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"/>

A *Biological Resources Technical Memorandum* has been prepared to update the findings in the FEIS and to address subsequent modifications to resources based on consultation with the resource agencies (see Appendix C, *Biological Resources Information*).

3.4.1 Environmental Setting

This section describes the regional and local environmental setting with regard to biological resources. A more detailed description of the environmental setting and the methods used to characterize the environmental setting can be found in Appendix C.

3.4.1.1 Vegetation Communities and Habitats

A mix of conifer, hardwood, chaparral, riparian, and serpentinite communities can be found at elevations below 5,000 feet. At elevations above 5,000 feet, forested areas are predominantly coniferous. Some areas are barren, devoid of vegetation due to rocky and steep terrain with little to no soil layer and are punctuated by low-statured shrubs.

California Wildlife Habitat Relationships (CWHR) habitats in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are listed in Table 3-4, and

their locations shown in the mapbooks included in Appendix C.² It should be noted that the location and extent of these habitats have not been ground-truthed.

Table 3-4. CWHR Habitats

Habitat	Upper Drum-Spaulding	Lower Drum
Annual Grassland (AGS)	X	X
Aspen (ASP)	X	
Barren (BAR)	X	
Blue Oak-Foothill Pine (BOP)		X
Blue Oak Woodland (BOW)		X
Cropland (CRP)		X
Douglas Fir (DFR)		X
Jeffrey Pine (JPN)	X	
Lacustrine (LAC)	X	X
Mixed Chaparral (MCH)	X	X
Montane Hardwood (MHW)	X	X
Montane Hardwood-Conifer (MHC)	X	X
Montane Riparian (MRI)	X	X
Perennial Grassland (PGS)	X	
Ponderosa Pine (PPN)	X	X
Red Fir (RFR)	X	
Riverine (RIV)	X	
Sierran Mixed Conifer (SMC)	X	X
Urban (URB)	X	X
Valley Oak Woodland (VOW)		X
Wet Meadow (WTM)	X	
White Fir (WFR)	X	

3.4.1.2 Special-status Natural Communities and Aquatic Resources

Sensitive communities and aquatic resources included are those that are protected under CDFW, Sections 1600–1603 of the California Fish and Game Code, and/or

² General descriptions of each habitat type, including physical conditions and dominant species, can be found on the Wildlife Habitats – California Wildlife Habitat Relationships System website (CDFW 2020).



Sections 401 and Section 404 of the Clean Water Act. Sensitive habitats typically either contain special-status species, their associated habitat, or are sufficiently rare themselves to warrant protection as ranked by the NatureServe Heritage Program Status Rank (S1–S3) (Faber-Langendoen et al. 2012).

In the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas, some aquatic resources and their associated riparian corridors would be considered sensitive communities because of their unique hydrophytic vegetation and ability to support special-status species. These areas may include, but are not limited to, reservoirs, streams, riparian areas, and wetlands. The Tahoe National Forest considers stands of quaking aspen a community of concern and specifically asked that this species be surveyed as part of the relicensing studies.

3.4.1.3 Fisheries Habitat and Essential Fish Habitat

Fisheries habitat present in the Proposed Upper Drum-Spaulling Project area includes 24 reservoirs, forebays, and afterbays; 1 diversion dam; 3 canals; and 27 stream reaches. For more information on each of these waterbodies, refer to the FEIS (FERC 2014) and Final License Application (PG&E 2011). Streams and reservoirs across the Proposed Upper Drum-Spaulling Project area support rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), and a transitional warm water fish assemblage in lower-elevation areas. Prior to the introduction of nonnative fish species, the Sierra Nevada native fish populations in accessible lakes and streams of the Sacramento-San Joaquin drainage included anadromous fish. Currently operated by the U.S. Army Corps of Engineers (USACE), Englebright Dam defines the upstream limit of salmon and steelhead migration, and none of these species are present in the existing Proposed Upper Drum-Spaulling Project area or any affected reaches (National Marine Fisheries Service [NMFS] 2014).

Fisheries habitat present in the Proposed Lower Drum Project area includes five dams and reservoirs, forebays, and afterbays; two diversion dams; four canals; and four stream reaches. The reservoirs associated with the Proposed Lower Drum Project include the Bear River Canal Diversion dam on the Bear River, the Halsey Forebay (off-channel), the Halsey Afterbay on Dry Creek, the Rock Creek Reservoir on Rock Creek, and the Wise Forebay (off-channel). Facilities associated with the Proposed Projects affect flows in Dry Creek below Halsey afterbay, Rock Creek below Rock Creek reservoir, Auburn Ravine³ below South Canal, and Mormon Ravine below Newcastle powerhouse. Figure 3-1 shows the extent of anadromy in Auburn Ravine. Streams and

³ The upper extent of anadromy in Auburn Ravine is at river mile 26.6, which is proximally downstream of the South Canal input.

reservoirs across the Proposed Lower Drum Project area also support rainbow trout, brown trout, and a transitional warm water fish assemblage in lower-elevation areas.

The Magnuson-Stevens Act requires federal agencies to consult with NMFS on all actions that may adversely affect essential fish habitat (EFH). EFH has been designated for Pacific salmon in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas (50 C.F.R. §§ 660.4391 and 660.392). The designation does not identify specific salmon species or races (for example, spring-run or fall-run); however, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley fall- and late-fall-run Chinook salmon are species that occur in the Central Valley and are managed under the *Pacific Coast Salmon Fisheries Management Plan*. The Vanjop Diversion Dam on the Bear River and the Bureau of Recreation's Folsom Project at Nimbus Dam prevent passage of anadromous fishes into the Proposed Lower Drum Project area through the Bear River and American River. Passage of anadromous fish within the Sacramento River Basin to Auburn Ravine is possible. USACE's Englebright dam prevents passage of anadromous fishes into the Proposed Upper Drum-Spaulding Project area, including Chinook salmon; therefore, no species that are covered by EFH designations can naturally occur in the Proposed Upper Drum-Spaulding Project area (NMFS 2014).

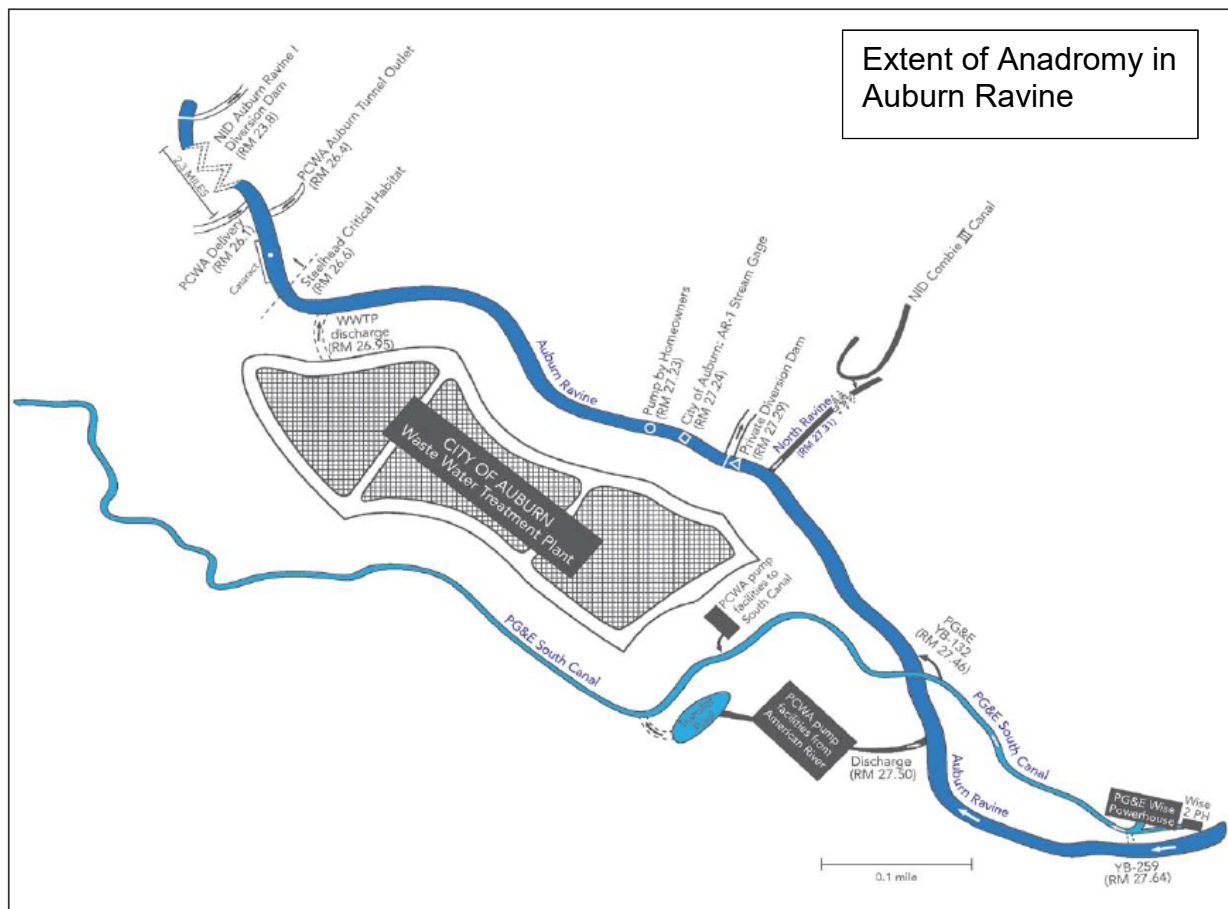


Figure 3-1. Extent of Anadromy in Auburn Ravine

3.4.1.4 Critical Habitat

Designated critical habitat for Sierra Nevada yellow-legged frog encompasses portions of the Proposed Upper Drum-Spaulling Project area (50 C.F.R. Part 17). The following Upper Drum-Spaulling Project reservoirs are included in designated critical habitat subunit 2C (Black Buttes): Upper Rock Lake, Lower Rock Lake, and Lake Spaulling. No designated critical habitat for other listed fish or wildlife occurs in the Proposed Upper Drum-Spaulling Project area.

In NMFS's 5-year review of Central Valley steelhead, it concluded that the threatened Central Valley steelhead distinct population segment (DPS) included all naturally spawned populations of steelhead below natural and human-made barriers in the Sacramento and San Joaquin Rivers and tributaries. Auburn Ravine river mile (RM) 0.0 to 26.6 is classified as critical habitat for Central Valley steelhead. This is the only designated critical habitat in the Proposed Lower Drum Project area.

3.4.1.5 Fish and Wildlife Movement Corridors

Wildlife corridors refer to established migration routes commonly used by resident and migratory species for passage from one geographic location to another. Corridors are present in a variety of habitats and link otherwise fragmented habitats. Riparian corridors associated with the various rivers, and their tributaries, likely facilitate local and regional wildlife movement.

Most of the watershed basins associated with the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas have downstream dams that are not part of the Proposed Projects that block the migration of anadromous fishes, although the Proposed Projects' dams act as existing aquatic migration barriers to current fish populations. Canals and other facilities may act as barriers to local and regional wildlife movement; however, wildlife crossings are present and several measures are included in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project to increase permeability.

Anadromous fish have access to Auburn Ravine, a tributary of the Sacramento River. Auburn Ravine also provides critical habitat for Central Valley steelhead. Within the geographic scope of the Proposed Projects, critical habitat includes Auburn Ravine from RM 0 to 26.6. Critical habitat for Central Valley steelhead contains physical habitat essential to the conservation of a species, known as primary constituent elements (PCEs). Within Auburn Ravine, biological features that are considered vital for Central Valley steelhead include habitat for adult and juvenile migration, spawning incubation, and juvenile rearing.

3.4.1.6 Special-status Species

Candidate, sensitive, or special-status species are commonly characterized as species that are at potential risk or actual risk to their persistence in a given area, or across their native habitat. These species have been identified and assigned a status ranking by governmental agencies such as CDFW, USFWS, and private organizations such as the California Native Plant Society (CNPS). The degree to which a species is at risk of extinction is the determining factor in the assignment of a status ranking. Some common threats to a species' or population's persistence include habitat loss, degradation, and fragmentation, as well as human conflict and intrusion. For the purposes of this document, special-status species are defined as follows:

- Listed, proposed, or candidates for listing under the federal Endangered Species Act (ESA; 50 C.F.R. § 17.11 – listed; 61 *Federal Register* 7591 (February 28, 1996) – candidates)



- Listed or proposed for listing under the California Endangered Species Act (CESA; Fish and Game Code, § 2050 et seq.; California Code of Regulations, tit. 14, § 670.1 et seq.)
- Designated as a species of special concern by CDFW
- Designated as fully protected by CDFW (Fish and Game Code, § 3511, 4700, 5050, 5515)
- Species that meet the definition of rare or endangered under CEQA (14 California Code of Regulations Section § 15380), including CNPS List Rank 1b and 2
- Species designated as sensitive by the Forest Service for the Tahoe National Forest under Forest Service Manual 2672.11, 2670.44–2670.5

The results of the USFWS, NMFS, CDFW, CNPS, and Forest Service queries identified several special-status species with the potential be affected by activities associated with the Proposed Projects. Tables in Appendix C, *Biological Resources Information*, provide descriptions of the habitat requirements for each species and conclusions regarding the potential for each species to be affected by the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project. In cases where a determination was made that no suitable habitat for a given species was present, that species is not analyzed further in this document (Appendix C).

Results of the relicensing studies were reviewed to help inform the potential for special-status species to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas; however, the majority of these studies are over a decade old, making some of the findings and conclusions regarding the presence or absence of species outdated. The species tables in Appendix C can be referenced to see which species have the potential to be affected by activities associated with the Proposed Projects.

3.4.2 Impact Analysis

For this impact analysis, activities associated with the Proposed Project are defined as modifications to existing flow operations, management plan implementation, and routine operations and maintenance, including vegetation management, minor recreational facilities improvements, and road maintenance. Operations and maintenance would be conducted in a similar manner to existing conditions - conducted in or around existing infrastructure, with very minimal, if any, ground disturbance or encroachment into undisturbed adjacent habitats. The disturbance area for activities associated with the Proposed Projects is defined as areas where ground disturbance, vegetation clearing, or in-water work is occurring, along with associated access areas. Changes in flow are

not included under the umbrella of activities, given the continuous nature of the Proposed Projects component, and will be addressed separately where impacts that could result from changes in flow could affect biological resources. As previously stated in Section 2, *Proposed Projects*, the new licenses for the Proposed Projects will require several changes to recreation sites and facilities. Because the future recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis. Site and construction plans for future undefined work associated with the Proposed Projects will require discretionary approvals and environmental analysis prior to any construction activities.

The biological resources impact analyses below takes the conditions (Table 2-4 and Table 2-7) and plans described below into account when assessing the level of impact resulting from activities associated with the Proposed Projects. However, the implementation plans discussed below do not themselves adequately minimize impacts on resources, as many are focused solely on monitoring rather than avoidance, and may not explicitly apply to activities on privately owned lands in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas (PG&E 2011). Where appropriate, conditions of the water quality certification will be administered to minimize potential impacts on these resources.

3.4.2.1 Conditions and Implementation Plans

Conditions pertaining to biological resources are included in Table 2-4 in Section 2.2, *Proposed Upper Drum-Spaulding Project Description*, and in Table 2-7 in Section 2.3, *Proposed Lower Drum Project Description*. These include FERC recommended conditions, PG&E proposed conditions, Forest Service 4(e) conditions, and other conditions recommended by agencies such as CDFW. Conditions resulting in an effect (either positive or negative) on sensitive biological resources are discussed later in the impact analysis, as appropriate.

As part of the Proposed Projects and in consultation with other relicensing participants, PG&E has developed 15 resource implementation plans in an effort to limit significant impacts associated with the Proposed Projects on environmental resources. These implementation plans have been filed with the Final License Application (PG&E 2011) and accepted by FERC as part of the FEIS. Implementation plans that specifically address or refer to biological resources and include measures to minimize impacts on biological resources are described below. In addition, potential impacts on biological resources that have the potential to result from plan implementation are summarized below. Implementation plans that would have no positive or negative influence on biological resources are not included below.

3.4.2.1.1 *Fish Protection and Management during Canal Outages Plan*

The Proposed Projects includes water conveyance facilities (e.g., diversion conduits and canals) that PG&E periodically draws down (i.e., drains some/all of the water from the facility) for the purpose of facilitating maintenance activities. These conveyance facilities may also be drawn down during emergencies. The objective of the *Fish Protection and Management during Canal Outages Plan* is to minimize impacts (including mortality) to resident fish during outages or other maintenance activities while complying with all laws, regulations, and PG&E policies, where applicable. The process for canal outages includes oversight by a biologist, coordination with appropriate agencies, and methods for rescuing and salvaging fish (PG&E 2011). The purpose of this plan is to minimize effects on fish. No impacts on biological resources resulting from plan implementation are anticipated.

3.4.2.1.2 *Bald Eagle Management Plan*

The goal of the *Bald Eagle Management Plan* is to minimize the potential for Proposed Projects operations and maintenance, as well as recreation activities, to disturb nesting bald eagles by implementing measures such as Limited Operating Periods (LOPs) that are consistent with federal and State guidelines. The *Bald Eagle Management Plan* requires protocol-level surveys for nesting bald eagles within one mile of major Proposed Projects lakes every five years. Other measures include establishing nest buffers and LOPs for work within nesting buffers, nest monitoring, and annual employee awareness training (PG&E 2011). The purpose of the *Bald Eagle Management Plan* is to minimize effects on nesting bald eagles. No impacts on biological resources resulting from plan implementation are anticipated.

3.4.2.1.3 *Transportation Management Plan*

The *Transportation Management Plan* is intended to provide guidance for the rehabilitation and maintenance of roads on all lands in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Roads associated with the Proposed Projects are non-general use roads used primarily for activities associated with the Proposed Projects. Many of the proposed road rehabilitation measures include upgrading stream crossings and culverts. The *Transportation Management Plan* includes provisions to provide for fish and aquatic passage and proper stream function for all stream crossings associated with Proposed Projects road improvement projects and that are identified as fish habitat areas (PG&E 2011). Normal maintenance activities identified in this plan include road surface maintenance, repair and replacement of damaged culverts, cleaning debris and rockfall from drainage channels,

and vegetation removal to allow adequate sight distances and open travel way. All of these activities have the potential to impact biological resources.

3.4.2.1.4 *Integrated Vegetation Management Plan*

The *Integrated Vegetation Management Plan* (IVMP) is intended to provide guidance for the management of vegetation on federal lands within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. The IVMP includes measures to meet the following goals: (1) manage nonnative invasive plants by preventing their introduction, establishment, and spread, and by controlling and locally eradicating known infestations; (2) revegetate and restore native vegetation in areas disturbed by activities; (3) protect sensitive areas; (4) manage vegetation in recreation sites to ensure public safety, stand health, and maintain a natural environment; and (5) implement vegetation management and hazard reduction activities, according to best management practices (BMPs). Vegetation management is limited to areas adjacent to infrastructure, unless authorized by agencies such as the Forest Service during the annual consultation meeting. Species-specific measures include conducting special-status plant surveys of all federal land in the Proposed Projects area at least every ten years to identify known populations of rare plants, imposing LOPs for various special-status birds (California spotted owl, northern goshawk, and great gray owl), and restricting the use of pesticides within 500 feet of known special-status frog habitat (foothill yellow-legged frog, California red-legged frog, and Sierra Nevada yellow-legged frog). Finally, PG&E's IVMP includes provisions for an annual consultation meeting between PG&E and the agencies that choose to attend.⁴ Although this plan states it is only required on federal land, measures in the IVMP would be applied to all lands in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Activities outlined in the IVMP, such as vegetation management and hazard tree removal, have the potential to affect biological resources. Potential impacts resulting from these activities would be mitigated as described in the impact assessment below (PG&E 2011).

3.4.2.1.5 *Erosion and Sediment Control Management Plan*

The *Erosion and Sediment Control Management Plan* specifies PG&E and Forest Service BMPs to control site-specific erosion and sedimentation impacts during new construction, reconstruction, and heavy maintenance of facilities, including emergency erosion control measures and protocols to control sedimentation during and after severe

⁴ PG&E will provide notice to USFWS, CDFW, NMFS, the Forest Service, and State Water Board, who may choose to participate in the meeting.

storm events. Temporary erosion prevention and control measures would be implemented during construction or reconstruction of facilities and infrastructure. This includes, but is not limited to, reconstruction at dam sites, road reconstruction, and recreation site development where ground disturbance and/or vegetation removal is expected (PG&E 2011). Activities associated with this plan are not anticipated to impact biological resources.

3.4.2.1.6 *Riparian Vegetation Monitoring Plan*

The *Riparian Vegetation Management Plan* is limited to monitoring of riparian vegetation at three locations in the Proposed Upper Drum-Spaulding Project area, including reaches downstream of Fordyce Dam, Spaulding Dam, and Lake Valley Reservoir, and co-located with monitoring locations included in the *Channel Morphology Monitoring Plan*. Changes in the canopy coverage, species richness, or abundance of native woody riparian vegetation that exceed 20 percent from baseline conditions would trigger consultation with appropriate agencies to determine whether changes in vegetation may be caused by activities associated with the Proposed Projects and whether further monitoring is warranted. The woody riparian stratum was selected as the indicator because it was determined, through consultation with the Forest Service, BLM, State Water Board, and CDFW, to be the most likely to withstand annual fluctuations in water years while still being responsive to flow cessation (PG&E 2011). No impacts on biological resources resulting from the implementation of the *Riparian Vegetation Management Plan* are anticipated.

3.4.2.1.7 *Foothill Yellow-legged Frog Monitoring Plan*

The purpose of the *Foothill Yellow-legged Frog Monitoring Plan* is to monitor foothill yellow-legged frog populations in stream reaches where the foothill yellow-legged frog has been found and includes sites where data are needed to assess response to flow-related changes in conditions in the proposed new licenses (e.g., minimum flows, spill cessation, water temperatures, and aquatic habitat suitability). All findings would be reported to interested agencies, including the Forest Service and CDFW. The purpose of the *Foothill Yellow-legged Frog Monitoring Plan* is to collect data to monitor known population of foothill yellow-legged frog. No impacts on biological resources resulting from plan implementation are anticipated.

3.4.2.1.8 *Fire Prevention and Response Plan*

The purpose of the *Fire Prevention and Response Plan* is to provide fire prevention procedures, reporting, and safe fire practices for personnel and contractors responsible for operations and maintenance in the Proposed Project areas. Most of the actions

included in the *Fire Prevention and Response Plan* would not impact biological resources, with the exception of utility corridor and hazard tree clearing. All clearing would follow the specifications of the IVMP.

3.4.2.1.9 *Recreation Facilities Plan*

The primary goal of the *Recreation Facilities Plan* is to manage public recreation use of the Proposed Project's recreation facilities over the term of the license, and minimize recreation-use impacts to natural, historic, and prehistoric resources within the Proposed Project areas. The *Recreation Facilities Plan* proposes several recreation improvements including new facilities and enhancements to existing facilities. Only enhancements to existing facilities, which include very minimal ground disturbance or work limited to the replacement or improvement of existing structures, roads or developed areas, are included in this impact analysis. In addition, vegetation management in and around recreation facilities will be conducted per the IVMP and is included in this plan and analysis. Activities associated with the *Recreation Facilities Plan* that have the potential to impact biological resources include disturbance resulting from recreation enhancement activities and road resurfacing, as well as vegetation management.

3.4.2.1.10 *Canal Release Plan*

The *Canal Release Plan* provides information on PG&E's preferred and emergency canal drainage structures, associated release points, and immediate downstream spill channel (known collectively in the *Canal Release Plan* as a "Canal Release Point") and is intended to establish practices that will minimize adverse impacts to water quality. These practices include reducing flow rates in advance of major storm events to reduce risk of emergency spills, utilizing existing "sand settling" features in canals to prevent migration of fines into spillway channels and downstream receiving streams, and modifying spill release flows when draining canals to control erosion and spillway channel turbidity. Activities associated with the *Canal Release Plan* are not anticipated to impact biological resources.

3.4.2.2 Impact Discussion

Mitigation measures are presented below to avoid, minimize, and/or mitigate for potentially significant impacts not sufficiently mitigated for through implementation of the conditions and plans, as necessary. Given the large area, range of elevations, and breadth of habitats associated with the Proposed Projects, many of the special-status species and other sensitive biological resources would not occur across both Proposed Projects or the entirety of one Proposed Project area and, thus, measures would not



necessarily be required for all activities. For this reason, the impact discussion and avoidance and minimization measures presented in the following sections would be implemented as mitigation measures generally applying to all areas and activities of the Proposed Projects, unless otherwise specified by a qualified biologist reviewer, to supplement any avoidance, minimization, and monitoring of biological resources included in implementation plans.

Given the expansive temporal and spatial nature of the Proposed Projects, the potential for various biological resources to be affected by components of the Proposed Projects vary depending on activity, location, and timing. For this reason, potential impacts on biological resources may need to be assessed on an activity-by-activity basis, especially activities that could result in more significant ground disturbance, vegetation clearing, or encroachment into habitats adjacent to infrastructure (see MM-BIO-1 below). The implementation of some of the mitigation measures provided in the impact analysis are contingent upon a review by a qualified biologist and the need for them would be determined after a review of the activity proposed and site conditions.

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 Game or U.S. Fish and Wildlife Service?

Potentially significant unless mitigation incorporated.

Based on the results of the literature review and the findings from previous surveys, several special-status plant and wildlife species are known to occur, or have the potential to occur, in the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas. The special-status species or species groups identified below were determined to have the potential to occur in the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas, and may be affected either directly or through habitat modifications, or indirectly through effects that could occur post-activity. The avoidance and minimization measures presented under each special-status species group would be implemented for any activities resulting in ground disturbance, vegetation removal, or in-water work as determined by a qualified biologist (MM-BIO-1).

Special-status Plants

Surveys for special-status plant species were conducted as part of the relicensing studies. The surveys included the area surrounding all facilities and recreation sites in the Proposed Upper Drum-Spaulling Hydroelectric Project and Proposed Lower Drum Hydroelectric Project Boundaries. During these surveys, a total of 12 occurrences of special-status plants were documented in the Proposed Upper Drum-Spaulling Project

area, and included Sierra bluegrass (*Poa sierrae*), scalloped moonwort (*Botrychium crenulatum*), whitebark pine (*Pinus albicaulis*), and several other species that do not meet the definition of special-status as defined for this analysis. None of the species observed during surveys of the Proposed Lower Drum Project area meet the definition of special-status as defined for this analysis. A full description of findings can be found in Section 6-4 of Exhibit E of the Final License Application (PG&E 2011).

The literature review concluded that suitable habitat for numerous special-status plant species is present in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Special-status plant species with the potential to occur in the Proposed Project areas are listed in Appendix C, along with their listing status. Species with a Forest Service sensitive (FSS) listing and no other federal, state, or CRPR listing would be considered sensitive only on Tahoe National Forest land, and thus these species are only a concern for the Proposed Upper Drum-Spaulding Project. If special-status plants are present in areas proposed for disturbance, individuals or populations could be affected by compaction, trampling, removal, erosion, or degradation of habitat. Degradation of habitat could include the spread of non-native invasive plants into areas supporting special-status plants.

The IVMP includes measures to prevent and control the spread of non-native invasive plants and to protect known sensitive areas, including special-status plant populations. The IVMP requires a botanical survey of the entire Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas every ten years. This will facilitate the identification and avoidance of special-status and high-priority non-native invasive plant populations. It was determined by FERC in the FEIS that management plans that are part of the proposed new licenses would apply and be implemented throughout all land that is part of the Proposed Projects for the term of the license. This would include implementation on privately owned and other lands in addition to federal land (FERC 2014).

Implementation of measures in the IVMP would allow for regular identification and mapping of special-status plant populations which would then be avoided during routine maintenance activities including vegetation and hazard tree removal. Other routine operations and maintenance would largely be confined to developed lands of existing infrastructure or areas subject to long term and ongoing disturbance. Measures included in the IVMP also serve the purpose of controlling the spread of non-native invasive species by requiring surveys, monitoring and treatment, as well as revegetation of areas disturbed by activities related to the Proposed Projects.

Per the IVMP, botanical surveys are required every 10 years; however, there is potential for plant populations to spread and/or shift location over the course of several years.



For this reason, plant populations mapped near areas proposed for disturbance have the potential to be impacted by activities related to the Proposed Projects if the population is altered since the last botanical survey.

Without mitigation, implementation of activities related to the Proposed Projects may result in direct and/or indirect significant impacts on these species if they are present in areas proposed for disturbance.

To minimize additional potential impacts on special-status plant species on both federal and privately owned lands, including direct take of individuals and degradation of habitat, implementation of the following avoidance, minimization, and mitigation measures is recommended to supplement the conditions and plans. General biological mitigation measures (MM-BIO-1 through MM-BIO-3) that will pertain throughout other topics have been included as well as specific mitigation measures (MM-PLANT-1 and MM-PLANT-2) required to reduce potentially significant impacts to special-status plants to a level that is less than significant.

Mitigation Measures:

MM-BIO-1 Biologist Review. Prior to the start of activities associated with the Proposed Projects that have the potential for in-water work or significant ground disturbance and/or vegetation removal (for example, activities other than those listed in Section 3.2 of the IVMP), a qualified biologist shall conduct a desktop or field review, as appropriate, to determine whether any sensitive biological resources (special-status species, sensitive communities, aquatic resources, etc.) have the potential to be affected by the proposed activity. If special-status species and/or sensitive biological resources could be affected by the proposed activity, the biologist shall determine what avoidance, minimization, and mitigation measures are required to avoid impacts and PG&E will implement those measures. If the qualified biologist determines that the proposed activity would have no impact on special-status species or sensitive biological resources, then no further steps will be necessary.

MM-BIO-2 Biological Monitor. Prior to the start of an activity associated with the Proposed Projects, if deemed necessary during the review in MM-BIO-1, a qualified biologist(s) shall monitor activities that could affect special-status species and/or sensitive biological resources. The amount and duration of monitoring would depend on the activity and would be determined by the qualified biologist, and monitoring reports would be provided as specified in applicable permits. In addition to standard field monitoring, the duties of the qualified biologist shall comply with all conditions contained in permits and licenses associated with the Proposed Projects, but could include

activities such as clearance surveys, flagging or fencing off environmentally sensitive areas for avoidance, and monitoring.

If deemed necessary during the review in MM-BIO-1, the biological monitor shall conduct clearance surveys for special-status species prior to the start of activities associated with the Proposed Projects on the first scheduled day of work, prior to the commencement of any work. In the event that individuals are found within or directly adjacent to the disturbance areas, the area shall be left unaffected until the individual(s) have left the area or a relocation decision has been made in consultation with the appropriate agencies (for example, USFWS, BLM, CDFW, and Forest Service).

MM-BIO-3 Minimizing Footprint. During all activities associated with the Proposed Projects, the work areas shall be reduced to the smallest possible footprint. All parking, storage areas, laydown and staging sites, and any other surface-disturbing activities shall be limited to previously disturbed areas whenever possible. Any sensitive areas to be avoided during Proposed Project activities shall be fenced and/or flagged as close to work limits as feasible.

MM-PLANT-1 Special-status Plant Surveys. Prior to the start of activities associated with the Proposed Projects that have the potential for significant ground disturbance and/or vegetation removal (for example, activities other than those listed in Section 3.2 of the IVMP), a review for the most recent botanical survey data shall be conducted to determine whether any known populations of special-status plants occur within 500 feet of the proposed disturbance footprint. A special-status plant survey conducted by a qualified botanist shall be required if one of the following circumstances applies:

- There are known special-status plant populations within 500 feet of the disturbance area and botanical surveys have not been conducted in the proposed disturbance footprint in the last 5 years. The survey would determine whether nearby special-status plant populations have spread into the disturbance area.
- There are known special-status plant populations in the proposed disturbance area. The survey would determine the current extent of the special-status plant population that could be directly affected by activities.

These surveys shall document whether special-status plants may be affected by the activity and shall be conducted in accordance with CDFW's *Protocols for Surveying and Evaluating Effects on Special-Status Native Plant Populations and Sensitive Natural Communities* (2018). Surveys shall be scheduled to coincide with known blooming periods, and/or during appropriate developmental periods that are necessary to identify the plant species of concern. If neither of the above circumstances apply, then no surveys are required.

MM-PLANT-2 Special-status Plant Avoidance. If any state-listed, federally listed, FSS (on Tahoe National Forest land), and/or CNPS List 1 or CNPS List 2 plant species are found within 100 feet of disturbance areas during the surveys, these plant species shall be avoided to the greatest extent possible and the following shall be implemented:

- Any special-status plant species that are identified in or adjacent to the proposed disturbance areas, but not proposed to be disturbed, shall be protected by flagging, signage, orange plastic fence, and/or silt fence as appropriate based on site conditions to limit the effects of activities and material stockpiles on any special-status plant species.
- If activities would result in the loss of greater than 10 percent of a population identified in the IVMP survey or occupied habitat for a special-status plant species, PG&E will consult with the agency with jurisdiction over the species and, if required, develop in consultation with that agency a mitigation plan that will describe a program to transplant, salvage, cultivate, and reestablish the species at suitable sites (if feasible); payment to an in-lieu fee program, if available; means and methods to propagate affected special-status plants through vegetative or reproductive means (for example, harvesting of seed or seed bank through topsoil collection, salvaging and transplanting or collecting of cuttings), as appropriate for the species, and transplant at suitable receiving sites as close to the existing population as possible. Propagation and transplantation shall occur prior to initiation of the activity. The receiving location shall be evaluated and chosen based on similarity to conditions at the transplant source location. Site conditions to consider when choosing a receiving site shall include aspect, substrate, hydrology, associated species, and canopy cover. The transplanted plants shall be monitored for at least 1 year following transplantation. If the plant is an FSS species, the mitigation plan shall be submitted to the Forest Service for review and comment at least 30 days prior to implementation.
- The actual level of mitigation may vary depending on the sensitivity of the species, its prevalence in the area, the location of the occurrence, and the current state of knowledge about overall population trends and threats to its survival; however, at a minimum, the species and habitat must be replaced at a 1:1 ratio (individuals or acreage of occupied habitat).
- Mitigation as required in applicable regulatory permits obtained by PG&E from USFWS, CDFW, and/or the Forest Service, or through consultation during the annual meeting, will satisfy this measure.

Implementation of the IVMP would minimize impacts on special-status plants by requiring employee awareness training, restoring habitat for special-status plants, limiting the spread and encroachment of non-native invasive plants, and allowing for monitoring and adaptive management of special-status plant populations. Additionally, the measures MM-BIO-1 through MM-BIO-3 would reduce areas of disturbance to the smallest footprint feasible in order to avoid unnecessary encroachment into areas that may support special-status plants. Finally, implementation of MM-PLANT-1 and MM-PLANT-2 would further minimize impacts on special-status plants by requiring preconstruction surveys if known populations are nearby, along with avoidance or mitigation for unavoidable impacts. Implementation of the aforementioned mitigation measures would reduce impacts on special-status plants to a less than significant level.

3.4.2.3 Special-status Invertebrates

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) and western bumble bee (*Bombus occidentalis*) are the two special-status invertebrates with the potential to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Valley elderberry longhorn beetle is listed as federally threatened, thus, take of valley elderberry longhorn beetle is prohibited unless authorized pursuant to the federal ESA. On June 28, 2019, CDFW published findings of its decision to advance western bumble bee to candidacy as endangered. Thus, take of western bumble bee during the status review period is prohibited unless authorized pursuant to the California Endangered Species Act. The status of western bumble bee may change over the lifetime of the Proposed Projects' licenses—once a determination of listing is made, the species will either become state listed as endangered or the candidacy for listing will be rejected and the species will no longer be considered special-status.

Western bumble bee may be found throughout the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas; however, open shrub, meadow, and wetland habitats with an abundance of flowering plants provide optimal habitat for this species. According to CWHR habitat mapping, open shrub and wetland habitats are present in both Proposed Project areas whereas meadows habitats are found exclusively in the Proposed Upper Drum-Spaulding Project area. Colonies typically nest in underground cavities such as small mammal burrows, but can also use aboveground features including hollow logs, brush piles, and thatched grass. The nesting season typically begins in mid-March and ends by October (Forest Service 2018). Potentially significant impacts on western bumble bee, if it is present, include loss of foraging plants, loss of nest habitat, changes in foraging behavior, nest abandonment, reduced nest success, or direct mortality.



Valley elderberry longhorn beetle is associated exclusively with its host plant elderberry (*Sambucus* spp.). Elderberry shrubs below 500 feet in elevations are considered suitable habitat for the beetle (USFWS 2019). The entirety of the Proposed Upper Drum-Spaulding Project area and vast majority of the Proposed Lower Drum Project area is over 500 feet above mean sea level with the exception of the areas around the Newcastle Powerhouse. As stated in the IVMP, PG&E will comply with the March 2003 *Valley Elderberry Longhorn Beetle Conservation Program* developed by PG&E and USFWS (USFWS Biological Opinion 1-1-01-F-0114) until the program's expiration in 2033 or the delisting of valley elderberry longhorn beetle, whichever comes first (PG&E 2011). New construction activities are not covered under the program; however, these would be assessed and permitted separately and are not included in this CEQA analysis. If the program expires prior to species delisting, PG&E will consult with USFWS, as necessary, to determine whether new VELB management measures are appropriate. Potential impacts on valley elderberry longhorn beetle are anticipated to be less than significant due to ongoing compliance with the existing programmatic biological opinion.

To minimize potential impacts on special-status invertebrates, including direct take of individuals and degradation of habitat, implementation of MM-BEE-1 and MM-BEE-2 is needed to supplement the conditions and plans. Implementation of the general biological mitigation measures identified above (MM-BIO-1 through MM-BIO-3) along with specific mitigation measures are required to reduce potentially significant impacts on special-status invertebrates. The requirement to implement the following measures shall be determined by the qualified biologist, in accordance with MM-BIO-1.

Mitigation Measures:

MM-BEE-1 Western Bumble Bee Nest Avoidance. A qualified biologist shall conduct a site review (MM-BIO-1) prior to activities that could result in significant ground disturbance and, if they determine suitable nesting and foraging habitat for western bumble bee is present in or within 50 feet, or an agreed minimum distance determined through consultation with CDFW, of the disturbance area, then nesting and foraging habitat shall be avoided. Suitable habitat shall be avoided by a minimum of 50 feet, if feasible, or work shall be done between November and February to avoid the nesting season. This measure will be implemented only if western bumble bee remains a candidate or becomes formally listed under CESA.

MM-BEE-2 Western Bumble Bee Habitat Replacement. Mitigation for permanent impacts on western bumble bee nesting and foraging habitat shall be provided at a minimum 1:1 ratio. Mitigation is to be determined in consultation with CDFW. Mitigation

as required in applicable regulatory permits obtained by PG&E from CDFW or during the annual consultation meeting may be applied to satisfy this measure. This measure will be implemented only if the western bumble bee remains a candidate or becomes formally listed under CESA.

Implementation of the IVMP would minimize impacts on special-status invertebrates by requiring annual employee awareness training, avoiding known biologically sensitive areas, and restoring habitat for special-status species through revegetation activities. Additionally, implementation of MM-BIO-1 to MM-BIO-3 would provide general avoidance, including but not limited to reducing areas of disturbance to the smallest footprint feasible to avoid unnecessary encroachment into areas that may support western bumble bee and valley elderberry longhorn beetle. Implementation of MM-BEE-1 and MM-BEE-2 would further minimize disturbance to western bumble bee by requiring avoidance of nesting habitat for bees, replacement of permanent loss of bee habitat, and mitigation for unavoidable impacts. Continued participation in the *Valley Elderberry Longhorn Beetle Conservation Program* would minimize potential impacts on the beetle resulting from activities associated with the Proposed Projects. Implementation of the aforementioned mitigation measures would reduce impacts on special-status invertebrates to a less than significant level.

3.4.2.4 Special-status Aquatic Species

Six special-status aquatic species have the potential to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas including two fish, four amphibians, and one reptile. In addition to steelhead (Central Valley DPS; *Oncorhynchus mykiss*) and hardhead (*Mylopharodon conocephalus*)—the two special-status fish with potential to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas—rainbow trout are also considered a recreational species of concern. The other species, southern long-toed salamander (*Ambystoma macrodactylum sigillatum*), foothill yellow-legged frog (*Rana boylei*), California red-legged frog (*Rana draytonii*), Sierra Nevada yellow-legged frog (*Rana sierrae*), and western pond turtle (*Emys marmorata*), are grouped in the second discussion. Avoidance measures for all species along with a final impact determination for all special-status aquatic species is included at the end of this subsection.

3.4.2.4.1 *Special-status Fish*

The Central Valley steelhead DPS is federally listed as threatened and consists of all naturally spawning populations below natural and human-made barriers in the Sacramento and San Joaquin Rivers and tributaries. Central valley steelhead DPS is currently listed as a threatened species under the ESA and has the potential to occur in



the geographic scope of the Proposed Lower Drum Project. Multiple barriers preclude the presence of anadromous fish such as steelhead from the Proposed Upper Drum-Spaulding Project area. Steelhead were not documented in stream reaches during relicensing surveys but have the potential to occur in Auburn Ravine. In 2004, PG&E and NID conducted fish surveys in Lower Auburn Ravine and identified steelhead as one of the fish present during surveys.

Critical habitat for steelhead has been designated in Auburn Ravine from RM 0.0 to RM 26.6. Physical and biological features associated with steelhead within Auburn Ravine include adult and juvenile migration, spawning and incubation, and juvenile rearing. Direct effects of Proposed Lower Drum Project operations in Auburn Ravine extend from the South Canal release point at RM 27.5 to approximately 1.2 miles downstream to Auburn Tunnel at RM 26.4. The City of Auburn Wastewater Treatment Plant (or Auburn WWTP) discharges water at RM 27.0. The Proposed Lower Drum Project directly affects flow in approximately 0.2 mile of designated steelhead critical habitat; however, in that section of Auburn Ravine, water management is influenced by both PG&E and the Auburn WWTP.

The quantity and quality of aquatic habitat may be affected by Proposed Projects operations, including the influence of flow, wetted perimeter, magnitude and frequency of inundation, availability and dispersal of large woody debris (LWD), the diversity and persistence of riparian vegetation, and distribution and characteristics of sediment/substrate. The objectives of various measures proposed by PG&E, and those recommended by relicensing stakeholders, are to improve aquatic habitat conditions for resident aquatic biota compared with existing conditions.

PG&E does not divert water from Auburn Ravine and any water that is released into Auburn Ravine by PG&E is done so indirectly by way of PG&E's South Canal. PG&E currently does not have a minimum flow obligation in Auburn Ravine. As shown in Table 2-6, the Proposed Project will have minimum flow obligations of 2 cfs in critical dry years to 18 cfs in wet years. Lower Drum Proposed Project operations result in flows that are similar to or higher than baseline flows and have little effect on designated critical habitat for steelhead, which primarily lies downstream of larger water management operations (Auburn WWTP, NID, and PCWA). Typical Proposed Lower Drum Project releases from South Canal, and releases that are not associated with the Proposed Projects are primarily for flood control, but also maintain streamflows that are usually higher than natural flows, incrementally supporting designated critical habitat for steelhead in Lower Auburn Ravine. Natural streamflow has occurred during canal outages (typically mid-October to mid-November) and flood events, but consistent flow will be maintained as a result of the proposed minimum instream flow at Wise

Powerhouse. Planned canal outages for annual maintenance are usually completed before late November. Post-canal outages are augmented by Wise and Wise No. 2 powerhouse operation through winter and spring.

Releases from South Canal during Wise and Wise No. 2 operation are viewed as a minimal impact on steelhead critical habitat because flows increase the frequency and duration of high-flow events and are timed with natural runoff events. In late spring, streamflows are maintained at levels higher than the natural flow in the designated critical habitat for steelhead in Auburn Ravine.

The hydroelectric spills from early November through mid-April correspond to adult migration timing and may improve migration conditions depending on the duration and magnitude of the spill. During hydroelectric spills, flows are ramped down to ambient conditions to avoid adverse effects on migrating steelhead. Hydroelectric spills can enhance steelhead spawning opportunities in Lower Auburn Ravine by providing sufficient flow to sustain suitable spawning conditions and intergravel flow. Periodic high flows help remove sediment from spawning gravels. The magnitude and timing of hydroelectric spills are in the same range as natural runoff events in the watershed.

Hardhead is listed as a California species of special concern and is considered sensitive by the Forest Service in the Tahoe National Forest. Hardhead is known to occur in waterways associated with the Proposed Upper Drum Spaulding Project and Proposed Lower Drum Project areas. Although hardhead was not documented in any of the stream reaches or reservoirs in the Proposed Project areas during relicensing surveys, it has the potential to occur in lower-elevation stream reaches of Lower Auburn Ravine and the South Yuba River. Hardhead was documented in Lower Auburn Ravine in 2004 during fish surveys. In comments on FERC's draft EIS, PCWA reported that surveys during 2012 collected hardhead in the South Yuba River near Humbug Creek, and potential hardhead in mixed minnow aggregations were observed upstream near Scotchman Creek.

Modifications to the quantity and quality of aquatic habitat for hardhead that may be affected by Proposed Projects' operations are similar to what was discussed for steelhead above. The objectives of various measures proposed by PG&E, and those recommended by relicensing stakeholders, are to improve aquatic habitat conditions for resident aquatic biota compared with existing conditions. While minor habitat usage differences exist, the minimum flow will provide greater consistency and quality of habitat for all of Auburn Ravine that will be realized by all native fishes.

Measures proposed by PG&E to improve flows and maintain water temperatures, in stream reaches below Proposed Projects' dams and diversions, are intended to improve

aquatic habitat and enhance aquatic resources. Changes in monthly minimum streamflows (Forest Service 4(e) Condition No. 27), spill cessation schedules (Forest Service 4(e) Condition No. 31), and supplemental South Yuba River releases (Forest Service 4(e) Condition No. 32) are key measures designed to protect, maintain, and enhance aquatic habitat for resident species in stream reaches affected by the Proposed Projects. The flow enhancements in many stream reaches vary seasonally and are based on water year type (Forest Service 4(e) Condition No. 26). The specified minimum streamflows have been selected to balance the flow and temperature requirements of various aquatic species such as resident rainbow trout, hardhead, steelhead, and foothill yellow-legged frog, and to balance associated costs in reduced power generation and risk to water delivery, particularly during exceptionally dry conditions. For more detailed information on these stream reaches and minimum streamflows, refer to the FEIS (FERC 2014) and Final License Application (PG&E 2011).

The increased minimum streamflows, spill cessation schedules, and supplemental flows for water temperature management and recreational boating could result in earlier and larger drawdown of some Proposed Projects' lakes/reservoirs, potentially affecting shallow water lake habitat, which is important juvenile-rearing habitat for some recreational species; however, these impacts would not affect hardhead or their associated habitat as they are not known to occupy lakes and reservoirs. Increased flows, reduced flow fluctuations, and cooler water temperatures that would result from flow measures proposed by PG&E and the relicensing stakeholders to enhance aquatic habitat also have the potential to affect habitat for hardhead in some reaches affected by the Proposed Projects.

The implementation of measures to improve flows and maintain water temperatures would extend to areas of the South Yuba River and Auburn Ravine that generally remain below 20 degrees Celsius (°C) year-round farther downstream than under the existing license. While this would expand optimal habitat for trout, it has the potential to displace optimal habitat for hardhead farther downstream in Auburn Ravine. Hardhead generally prefer warm water, occurring in streams that reach summer water temperatures greater than 20°C. Under laboratory conditions, their reported optimum water temperature range is 24°C to 28°C (Moyle 2002). Temperature modeling indicates that the effect of higher flows on reducing water temperature is dissipated with distance downstream by the warming effect of air temperature. Given that hardhead have the potential to occur in lower-elevation stream reaches, it is unlikely that the higher proposed flows would have a significant impact on hardhead or their habitat.

Reservoir operations and regulated flows have the potential to alter two key components of habitat for fishes: (1) the availability of LWD in downstream reaches and (2) the characteristics and distribution of substrate material in streams. In addition, rapid fluctuations and high flows have the potential to scour riparian vegetation that can provide bank stability and cover during periods of inundation. LWD can provide cover, affect habitat diversity, and contribute to diversity of channel morphology and substrate. Under the existing license, this material is removed from reservoirs as needed and stockpiled or burned. Forest Service 4(e) Condition No. 52 – Large Woody Debris requires a LWD management program, including survey of locations and quantity of LWD collected under the existing license, and identification of appropriate locations downstream of Proposed Projects' dams for reintroduction of LWD that would be mobilized during 2- and 5-year flow events.

The LWD management plan specified by the Forest Service, to which PG&E has agreed, requires an initial survey of LWD during the first license year and periodic follow-up surveys at 5-year intervals. The proposed surveys would identify: (1) Proposed Projects' reservoirs/lakes where LWD is trapped and accumulates in impoundments; (2) stream reaches where, as a result of Proposed Projects' operations, the quantity and distribution of LWD is less than would be expected given the watershed and channel characteristics; (3) sites with access and hydraulic characteristics that could serve as appropriate locations for reintroduction of LWD below impoundments; (4) appropriate quantities of LWD to introduce; and (5) whether reintroduced LWD is being adequately redistributed through the stream reach. The scope of the LWD management plan would be adequate to identify stream reaches with limited LWD as a result of Proposed Projects' operations that would benefit from reintroduction of LWD below Proposed Projects' dams.

Relicensing studies generally indicated that stream channels in stream reaches are stable, and substrate was typically composed of medium to coarse material. Specifically, these studies concluded that poor substrate quality and diversity observed in some stream reaches are typically relic conditions associated with historic hydraulic mining operations. Historical and current mining activities destabilized fledgling riparian growth and bed and banks and created huge sediment reservoirs through which many channels continue to work. These deposits are noncohesive, do not retain water well, and are not conducive to strong riparian growth. The relicensing channel morphology study found the mobility of spawning gravels in the stream reaches below Lake Spaulding Dam is no different than would exist under existing conditions (PG&E and NID 2011).



Several proposed flow modifications integrated into the spill cessation schedule would provide additional and predictable opportunities for recreational whitewater boating. A gradual cessation of spills to the South Yuba River at Lake Spaulding Dam, and the two-tier schedule, provides up to six days at higher flows when spills begin to decline that would accommodate recreational whitewater boating.

The spill cessation measure for the South Yuba River and Fordyce Lake drawdown would ensure that flow reductions following high-flow events more naturally mimic the rate of flow decrease typical of those waters in a natural condition. An additional benefit of this measure would be to provide predictable high-flow opportunities for recreational whitewater boating. As these high recreational flows are in a range and duration typical of spill events, we would not expect any significant impact on aquatic habitat and biota. The filed implementation plans for aquatic resources, including the *Fish Monitoring Plan* and the *Water Temperature and Stage Monitoring Plan*, would provide data for evaluating the impacts of high flows and flow cessation on aquatic resources.

Entrainment of fish may occur during regular Proposed Projects' operations, although the impact was found to be minimal during relicensing studies (FERC 2014). The results of these studies did not provide evidence of entrainment levels that might result in significant impacts on fish populations. The relicensing studies indicate that fish screens or other protective devices are not needed to protect reservoir or stream fish populations. In addition, the impact of entrainment of fish populations resulting from changes in flow and other Proposed Projects' activities will not increase under a new license as proposed and with applicable conditions, including 4(e) conditions and mitigation measures identified in this document.

To support resident rainbow trout, PG&E proposes minimum streamflows of 2 to 18 cfs, depending on month and water year type (Table 2-6), in Auburn Ravine at the release point (RM 27.6) from South Canal below the Wise and Wise No. 2 developments. The minimum streamflows proposed by PG&E and relicensing stakeholders for Auburn Ravine is consistent from May through February, where flows range from 2 to 4 cfs. Flows in March and April range from 2 to 18 cfs (based on water year type) and represent peak base flows proposed. The flow difference is in addition to any upstream runoff occurring naturally in Auburn Ravine, originating near the City of Auburn and would be also additive to much larger downstream inputs that are not associated with the Proposed Projects from the City of Auburn Wastewater Treatment Plant (RM 26.95) and PCWA's Tunnel Outlet (RM 26.4).

The considerable flow and habitat modeling that has been done has demonstrated that the proposed flow measures would significantly improve the quantity and quality of aquatic habitat in stream reaches affected by the Proposed Projects as compared with

the existing license (FERC 2014; CDFW 2015). Overall, there are anticipated enhancements of aquatic habitat as a result of proposed minimum streamflows and flow management. Although impacts on hardhead, steelhead, and their habitat would be avoided to the greatest extent possible, and an overall positive effect on fishes would result from increased flows, implementation of the Proposed Projects may result in direct and/or indirect impacts on these species if they are present in areas proposed for disturbance. Implementation of the *Fish Protection and Management during Canal Outages Plan* would minimize impacts on special-status fish during outages or other maintenance activities in Proposed Projects' water conveyance facilities by including oversight by a biologist, coordination with appropriate agencies, and methods for rescuing and salvaging fish. Although this plan would minimize impacts on special-status fish, it would be limited to Proposed Projects' canals and would not extend to activities conducted in other waters associated with the Proposed Projects. *Potential significant impacts on special-status fish could include direct mortality and sedimentation of aquatic habitat if in-water work would occur in areas not covered by the Fish Protection and Management during Canal Outages Plan.* To minimize additional potential adverse impacts on hardhead and steelhead, measures MM-AQUATICS-1 and MM-AQUATICS-2 would be implemented. Implementation of mitigation measures MM-AQUATICS-1 and MM-AQUATICS-2 would reduce the potential impact to special status fish to a less-than-significant level.

3.4.2.4.2 *Other Special-status Aquatic Species*

Other special-status aquatic species with the potential to occur in the Proposed Upper Drum Spaulding Project and Proposed Lower Drum Project areas include foothill yellow-legged frog (state threatened), California red-legged frog (federal endangered), Sierra Nevada yellow-legged frog (federal endangered and state threatened), as well as southern long-toed salamander and western pond turtle, both California species of special concern. Focused surveys conducted in association with the relicensing effort documented populations of foothill yellow-legged frog, Sierra Nevada yellow-legged frog, and western pond turtle in the Proposed Upper Drum Spaulding Project and Proposed Lower Drum Project areas. Aquatic habitats and adjacent uplands throughout the Proposed Upper Drum Spaulding Project and Proposed Lower Drum Project areas may provide suitable habitat for these species—as such, all of these species would experience the changes in minimum flows resulting from the Proposed Projects.

Increased flows, reduced flow fluctuations, and cooler water temperatures that would result from the Proposed Projects are anticipated to enhance stream habitat not only for fish but for other aquatic species. It is anticipated that the proposed minimum streamflows would preserve or enhance aquatic habitat for resident aquatic species as



compared with existing conditions (FERC 2014). Foothill yellow-legged frog populations would be monitored under the *Foothill Yellow-Legged Frog Monitoring Plan* to further support the determination made by previous studies that the changes to minimum flows would benefit the species. Reservoir elevations would only be slightly affected by the Proposed Projects; thus, no additional effects on amphibians or reptiles using the reservoirs are expected.

Activities associated with the Proposed Projects such as culvert maintenance or replacement as described in the Transportation Management Plan and any in-water work or work adjacent to suitable habitat have the potential to significantly affect special-status aquatic species and/or their associated habitat if they are present. The IVMP provides guidelines regarding avoidance of known sensitive resources, including special-status amphibians, during vegetation management activities. In addition, use of pesticides is restricted in areas within 500 feet of known locations of California red-legged frog, Sierra Nevada yellow-legged frog, or foothill yellow-legged frog. If these restrictions cannot be adhered to, then PG&E is required to conduct populations monitoring in the affected area as part of the IVMP.

To minimize additional potential impacts on special-status aquatic species, including direct take of individuals and sedimentation of aquatic habitat, implementation of the measures MM-AQUATICS-1 and MM-AQUATICS-3 would be necessary to supplement the implementation plans, various water-related conditions, and MM-BIO-1 through MM-BIO-3, to reduce the impacts to less than significant.

Mitigation Measures:

MM-AQUATICS-1 Stranded/Entrained Aquatic Species Rescue and Salvage

During Canal Outage Dewatering. During dewatering, and for the duration of any Proposed Projects' activities that involve dewatering of any waterbodies or waterways containing aquatic species, a qualified biologist(s) shall make a good faith effort to remove fish, frogs, turtles, and other aquatic vertebrate species in the manner described in the *Fish Protection and Management During Canal Outages Plan* (PG&E 2011). This measure does not apply to diversion of water from streams and canals and drawdown of impoundments for purposes of Project operations, as they are described in PG&E's FLA and FERC's Final EIS. Aquatic species rescue and salvage shall include the following, or as defined in applicable resource agency permits obtained by PG&E and approved plans:

- All species shall be captured using fine mesh or soft material nets and transported to release locations in a bucket, ice chest, or other carrying mechanism, with aeration

devices for species that require oxygenated water. Holding time shall be no longer than 45 minutes after capture.

- Handling of aquatic species shall be minimized to the greatest extent possible.
- Gloves shall always be worn during rescue and salvage efforts to minimize effects of handling to the greatest extent possible.
- Prior to entering the stream or initiating any rescue and salvage activities, all gear and equipment shall be decontaminated in a designated location where runoff can be contained.
- All species, except for invasive aquatic species (for example, bullfrog) shall be relocated to nearby surface waters in low enough numbers to not increase predation, and in appropriate sites to minimize the potential for reentry to the work area.
- Exclusionary devices (nets, screens, etc.) shall be used on any equipment or materials that have the potential to entrain aquatic species.

MM-AQUATICS-2 Wise Powerhouse Downramping and Stranding Surveys in Auburn Ravine. Beginning on October 16, through April 15, water discharges to Auburn Ravine will not be decreased at a rate exceeding 0.5 foot per hour, when flows are within control of the Project and when flow is below 80 cfs. Ramping rates will be measured at gage YB-259. This ramping rate shall not apply if a powerhouse relay occurs (trips offline) at either the Wise or Wise No. 2 powerhouse. If modifications are needed to existing equipment to comply with these releases, PG&E will target compliance with ramping rates until these modifications are completed. If modifications are needed, PG&E will file permits as soon as possible but within 3 years of license issuance and complete modification within 2 years of receiving final permits and approvals. No ramping rate will apply to Auburn Ravine during the irrigation season, which runs from April 16 through October 15.

To ensure that ramping rates perform as assumed, stranding surveys for juvenile and adult salmonids shall be performed. The stranding surveys methods will be designed in consultation with CDFW, USFWS, and the State Water Board and will be limited to the area above the Auburn Tunnel to the extent of salmonid anadromy. A qualified biologist will walk either shoreline as flows recede and become reasonably accessible. During the survey, less visible shoreline areas will be directly accessed to be viewed. Any stranded fish will be documented for its condition (alive or desiccated, life stage, visible injuries, etc.). A brief summary communication will be provided after each stranding survey within 15 days of occurrence. Stranding surveys shall be performed in the first



year of implementing ramping rates and up to 10 surveys shall occur. If no stranding is observed, surveys may cease and continued implementation of the ramping rates will occur. However, if stranding is documented, the flow conditions and factors surrounding that event will be reviewed and proposed modifications will be included in an Auburn Ravine Stranding Avoidance Plan. The Stranding Avoidance Plan may include physical modification, communication protocols, modified ramping rates, or other potential solutions.

An Auburn Ravine Stranding Avoidance Plan will be developed to prevent stranding of juvenile and adult salmonids in the area above the Auburn Tunnel to the extent of salmonid anadromy within 1 year of the first documented stranding survey. The Auburn Stranding Avoidance Plan will be developed with consultation with CDFW, USFWS, and the State Water Board and be submitted to the State Water Board for approval. The Auburn Ravine Stranding Avoidance Plan will include, at minimum, protocols for PG&E to communicate with other entities regarding PG&E's releases that affect flows in Auburn Ravine and ramping rates that are protective of juvenile and adult salmonids. PG&E will, within 4 months of documenting stranding, invite, at a minimum by letter, NID and PCWA to participate in the collaborative development of the communication protocols. If NID and PCWA decline to participate in development of the Plan or the parties cannot reach agreement on the Auburn Ravine Stranding Avoidance Plan, PG&E will submit the Auburn Ravine Stranding Avoidance Plan as described above.

MM-AQUATICS-3 No Net Loss of Listed Frog Habitat. Mitigation for permanent impacts on Sierra Nevada yellow-legged frog, California red-legged frog, or foothill yellow-legged frog aquatic habitat shall be provided at a minimum 1:1 ratio if required in regulatory permits issued through USFWS or CDFW. Mitigation can include on-site restoration or purchase of mitigation credits at a CDFW or USFWS-approved mitigation bank. Mitigation as required in applicable regulatory permits obtained by PG&E from USFWS or CDFW will satisfy this measure. Alternatively, mitigation as agreed upon with these agencies and/or the Forest Service during the annual consultation meeting may be applied. This measure will be in effect as long as these species are protected under ESA, CESA, or other similar federal or state laws.

Implementation of the *Fish Rescue and Canal Outages Plan* would minimize impacts on special-status aquatic species that may be found in Proposed Projects' water conveyance structures, and the *Erosion and Sediment Control Management Plan* would reduce sedimentation of aquatic habitats. In addition, the IVMP would reduce impacts on aquatic species by requiring annual employee training, avoidance of known sensitive biological areas, and restricted pesticide use near suitable habitats (PG&E 2011). Furthermore, implementation of measures MM-BIO-1 to MM-BIO-3 above would reduce

areas of disturbance to the smallest footprint feasible in order to avoid unnecessary encroachment into areas that may support special-status aquatic species, and require biological clearance surveys and monitoring (if deemed necessary). The *Erosion and Sediment Control Management Plan* requires the implementation of BMPs to reduce degradation of aquatic habitat attributable to sedimentation and pollution.

Implementation of MM-AQUATICS-1 and MM-AQUATICS-2 would further minimize the potential for take of special-status aquatic species by reducing fish stranding by rescuing and salvaging aquatic species during Proposed Project activities. Finally, MM-AQUATIC-3 would require permanent impacts on listed amphibian habitat to be replaced through compensatory mitigation. Implementation of the aforementioned mitigation measures, along with the conditions to increase flows throughout the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, would reduce impacts to a less than significant level.

3.4.2.5 Coast Horned Lizard

No occurrences of coast horned lizard were reported during surveys associated with the relicensing; however, the species has the potential to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas based on the presence of suitable habitat and known occurrences (CDFW 2020). This species ranges up to 4,000 feet above mean sea level in the Sierra Nevada and is associated with hardwood and conifer habitats with loose soil. Potentially significant impacts on coast horned lizards could include loss of individuals and habitat disturbance. These impacts would be reduced to a less than significant level through the implementation of the IVMP and measures MM-BIO-1 through MM-BIO-3 above by requiring a biologist review, reducing areas of disturbance to the smallest footprint feasible to avoid unnecessary encroachment into areas that may support coast horned lizard, along with clearance surveys and monitoring (MM-BIO-2), as appropriate. No additional measures are proposed.

Mitigation Measures: No additional mitigation required.

3.4.2.6 Special-status Birds

The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas may provide nesting, wintering, and/or foraging habitat for up to 19 special-status bird and raptor species, as well as nesting, wintering, and/or foraging habitat for other migratory birds and raptors not identified in the special-status species tables in Appendix C. Special-status birds and raptors with the potential to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas include northern goshawk (*Accipiter gentiles*), tricolored blackbird (*Agelaius tricolor*),

grasshopper sparrow (*Ammodramus savannarum*), golden eagle (*Aquila chrysaetos*), olive-sided flycatcher (*Contopus cooperi*), black swift (*Cypseloides niger*), white-tailed kite (*Elanus leucurus*), willow flycatcher (*Empidonx traillii*), American peregrine falcon (*Falco peregrinus*), bald eagle (*Haliaeetus leucocephalus*), harlequin duck (*Histrionicus histrionicus*), yellow-breasted chat (*Icteria virens*), loggerhead shrike (*Lanius ludovicianus*), California black rail (*Laterallus jamaicensis coturniculus*), song sparrow (*Melospiza melodia*), purple martin (*Progne subis*), yellow warbler (*Setophaga petechial*), great gray owl (*Strix nebulosa*), and California spotted owl (*Strix occidentalis occidentalis*). All native breeding birds (except game birds during the hunting season), regardless of their listing status, are protected under Fish and Game Code Section 3503.

Ground disturbance, as well as any vegetation and tree clearing during the nesting season, could result in direct impacts on nesting birds, if they are present in disturbance areas. Furthermore, noise and other human activity may result in nest abandonment if nesting birds are present near activities associated with the Proposed Projects.

The Forest Service has established special management areas (Protected Activity Centers, or PACs) for two of the special-status birds with the potential to occur in the Proposed Upper Drum-Spaulding Project area: northern goshawk and California spotted owl. According to the *Sierra Nevada Forest Plan Amendment* (Forest Service 2004), PACs are intended to protect northern goshawk and California spotted owl by providing a buffer between a nest and potential disturbances. PACs for both species overlap with the Proposed Upper Drum-Spaulding Project area. For more information on PACs, including their location in relation to the Proposed Upper Drum-Spaulding Project area, refer to the Final License Application (PG&E 2011). The Proposed Lower Drum Project does not overlap with National Forest Service lands, thus, no PACs area associated with the Proposed Lower Drum Project.

The IVMP sets buffers and LOPs for several special-status bird species, specifically northern goshawk, California spotted owl, great gray owl, and willow flycatcher. Focused nesting surveys for these species may also be required through IVMP implementation if nesting status in an area is unknown. Refer to the IVMP for specific LOPs, buffers and survey requirements for each species. In addition to the IVMP, the *Bald Eagle Management Plan* requires regular surveys for nesting bald eagles and imposes strict buffers and seasonal restrictions on Proposed Projects activities in relation to active nests. As shown, the IVMP would minimize impacts on only a select number of special-status species, and the *Bald Eagle Management Plan* covers only a single species; thus, supplemental measures would be needed to minimize impacts on nesting birds to a less than significant level (PG&E 2011). *For special-status birds not*

explicitly covered by conditions and implementation plans, there would be a potentially significant impact. MM-BIRDS-1 and MM-BIRDS-2 shall be implemented prior to any vegetation removal, along with measures MM-BIO-1 through MM-BIO-3, which would reduce impacts to below a level of significance.

Mitigation Measures:

MM-BIRDS-1 Migratory Bird and Raptor Surveys. Vegetation clearing should be conducted outside of the nesting season whenever possible. If activities requiring vegetation clearing or significant ground disturbance occur during the migratory bird nesting season (February 1 to August 31), then surveys to identify active migratory bird and/or raptor nests shall be conducted by a qualified biologist within 7 days prior to activity initiation. Focused surveys shall be performed by a qualified biologist for the purposes of determining the presence/absence of active nest sites within the disturbance area, including access routes. The qualified biologist will determine the area of the surveys.

MM-BIRDS-2 Nest Avoidance. If active nest sites are identified in or adjacent to disturbance areas, a no-disturbance buffer shall be established for all active nest sites prior to commencement of the relevant activities. A no-disturbance buffer constitutes a zone in which activities shall not occur. The size of no-disturbance buffers shall be determined by a qualified biologist based on the species, activities proposed in the vicinity of the nest, topographic and other visual barriers, and buffer requirements as defined in the IVMP. No-disturbance buffers will have a minimum size of 50 feet unless a qualified biologist determines site-specific conditions such as topographic or other visual barriers, low disturbance potential, proximity to existing human activity or development, or observed nesting bird behavior deem otherwise. The no-disturbance buffer shall be left in place until a nest is deemed inactive by a qualified biologist or the work is complete, whichever occurs first.

Implementation of the IVMP would minimize impacts on nesting birds by requiring annual employee awareness training and establishing LOPs for some species. Additionally, implementation of MM-BIO-1 to MM-BIO-3 above would reduce areas of disturbance to the smallest footprint feasible in order to avoid unnecessary encroachment into areas that may support nesting birds and require monitoring as needed (i.e. if LOPs and/or buffers cannot be adhered to). Finally, implementation of MM-BIRDS-1 and MM-BIRDS-2 would minimize impacts on nesting birds by requiring preconstruction surveys and active nest avoidance. Implementation of the aforementioned mitigation measures would reduce impacts to a less than significant level.

3.4.2.7 Special-status Mammals

Several species of special-status mammals have the potential to occur in the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas. For this impact analysis, they were split into two categories: special-status bats and other special-status mammals, with the latter category including both forest carnivores and herbivores.

3.4.2.7.1 *Special-status Bats*

The recent review of special-status wildlife species identified six special-status bat species known to occur or that have the potential to occur within the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas, including pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis*), spotted bat (*Euderma maculatum*), western red bat (*Lasiurus blossevillei*), and fringed myotis (*Myotis thysanodes*). These species may use a variety of habitats and structures for roosting and foraging that can be found throughout the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas, as well as in adjacent areas. Bat sign was observed at several structures during relicensing studies, including Spaulding No. 1 Powerhouse, Alta Powerhouse Intake Structure, Alta Powerhouse, Drum Powerhouse Butterfly Valve House, Drum No. 1 and No. 2 Powerhouse, and Drum Forebay Intake Structure. The tunnels and adits associated with the Proposed Projects were determined to be unsuitable for hibernating bats (FERC 2014).

Forest Service 4(e) Condition No. 48 minimizes potential impacts on bats roosting specifically in structures; however, special-status bats roosting in trees, rocky outcrops, or other structures could also be affected by other activities such as vegetation removal. *Impacts on special-status bats or their habitat would be considered a direct and significant impact if special-status bat species were taken or deterred from establishing maternity roosts.* Implementation of measure MM-BATS-1, if deemed necessary by the qualified biologist (MM-BIO-1), would supplement other measures to minimize impacts on special-status bats. If activities occur outside of the typical bat roosting season (April 1 to August 31), implementation of MM-BATS-1 is not required.

3.4.2.7.2 *Other Terrestrial Mammal Species*

Suitable foraging and denning/breeding habitat for the Sierra Nevada mountain beaver (*Aplodontia rufa californica*), gray wolf (*Canis lupus*), California wolverine (*Gulo gulo*), Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*), Pacific marten (*Martes caurina*), fisher (*Pekania pennanti*), American badger (*Taxidea taxus*), Sierra Nevada red fox (*Vulpes necator*), and ringtail (*Bassariscus astutus*) occurs in the Proposed

Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Most of these species are predominantly nocturnal, many are associated with permanent water sources such as streams/rivers, and many occupy burrows, hollow snags, logs, trees, dense brush or cavities in talus, and other rocky areas.

Activities associated with the Proposed Projects would largely avoid nighttime work. Impacts from activities on special-status mammal species could occur as a result of ground disturbance and vegetation clearing that would result in disruptions of denning or breeding activities. *Potential significant impacts on terrestrial mammals could include mortality and disturbance to individuals, dens, and their habitat.* It is assumed that non-breeding special-status mammals would leave the area when activities are initiated. Conditions and implementation plans would minimize impacts on these species in some capacity, such as requiring annual training and improving wildlife movement structures. Conditions improving mammal movement opportunities in the area are discussed in the wildlife corridor and movement section below. To minimize the potential impacts of the Proposed Projects on these species when breeding, implementation of measure MM-MAMMAL-1 is proposed if deemed necessary by the qualified biologist (MM-BIO-1). Implementation of the aforementioned mitigation measures would reduce impacts on special-status mammals to a less than significant level.

To minimize the potential impacts of the Proposed Projects on special-status mammals when breeding, implementation of measure MM-MAMMAL-1 is proposed for implementation prior to proposed activities requiring significant vegetation removal or ground disturbance.

Mitigation Measures:

MM-BATS-1 Bat Surveys and Avoidance. A qualified biologist shall conduct a site review (MM-BIO-1) prior to activities that could result in significant vegetation clearing, and if the biologist determines suitable roosting habitat for special-status bats is present in or within 100 feet of an activity in an undisturbed area, then bats would be protected in a similar manner as described in the Bat Management Plan included in the new license. Unless otherwise specified in the plan, activities shall occur outside of the typical roosting season (April 1 to August 31). If activities associated with the Proposed Projects cannot occur outside the roosting season, daytime reconnaissance surveys shall be completed by a qualified biologist prior to implementation of activities other than continued operation of the Proposed Projects in a manner that does not create any new impacts. The biologist, focused on suitable day roosting habitat such as rocky outcrops and trees, shall look for bats and bat signs including existing roost sites and bat guano deposits, and shall listen for roosting bats. If potential roost sites are identified, an exit nighttime survey shall be conducted to determine the species of roosting bats and



relative bat activity, and to estimate the number of individual bats. This nighttime survey may be an active or passive acoustic monitoring survey. If occupied bat roost sites are identified, appropriate spatial and temporal buffers shall be implemented to avoid and minimize impacts on roosting bats during Proposed Project activities by prohibiting activities within the buffer. The size of the buffers (minimum buffer of 50 feet unless a reduced buffer is accepted by CDFW) shall be determined by a qualified biologist based on the species, activities proposed in the vicinity of the nest, and topographic and other visual barriers. The buffers shall be left in place until a nest is deemed inactive by a qualified biologist. The size of the buffers may also be determined during the annual consultation meetings. If the daytime survey does not identify the presence of potential bat roosts, no further mitigation is required.

MM-MAMMAL-1 Breeding Mammal Surveys. A qualified biologist shall conduct a site review (MM-BIO-1) prior to activities that could result in significant ground disturbance or vegetation clearing and if the biologist determines suitable denning or breeding habitat for special-status mammals is present in or adjacent to an activity, then focused surveys shall be performed by a qualified biologist for the purposes of determining the presence/absence of active denning or breeding sites in the disturbance area. The disturbance area includes a required buffer of 50 feet around active dens and breeding sites for small mammals (for example, squirrels, rats, mice, rabbits) and 150 feet around active dens and breeding sites for larger mammal dens (for example, foxes and badgers).

If active denning or breeding sites are identified within disturbance areas, the applicant shall implement an LOP for all active den/breeding sites prior to commencement of any Proposed Project activities, other than continued operation of the Proposed Projects in a manner that does not create any new impacts, to avoid disturbances to breeding activities and/or habitat for special-status mammal species. An LOP constitutes a period during which activities (that is, vegetation removal, earth moving) shall not occur, and shall be in effect during the breeding season for the given species within the required buffer of any active denning or breeding sites until a qualified biologist deems breeding is inactive and the LOP can be lifted. Survey reports, as required by agencies with jurisdiction over the resource, will be provided.

Forest Service 4(e) Condition No. 48 would minimize impacts on bats utilizing structures associated with the Proposed Projects. Additionally, implementation of MM-BIO-1 to MM-BIO-3 above would reduce areas of disturbance to the smallest footprint feasible in order to avoid unnecessary encroachment into areas that may support breeding mammals. Finally, implementation of MM-BATS-1 and MM-MAMMAL-1 would minimize

impacts on breeding bats and other mammals by requiring preconstruction surveys and avoidance. Implementation of these mitigation measures would reduce impacts to a less than significant level.

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

Potentially significant unless mitigation incorporated.

All aquatic resources, wetlands, and riparian areas are considered sensitive natural communities. For this analysis, aquatic resources are defined as water features that are protected under Sections 401 and Section 404 of the Clean Water Act and CDFW, Sections 1600–1603 of the California Fish and Game Code. In addition, the Forest Service considers quaking aspen groves sensitive, and any vegetation communities ranked as S1–S3 by the NatureServe Heritage Program Status Rank are considered sensitive under CEQA (Faber-Langendoen et al. 2012). Impacts on sensitive communities as a result of activities are associated with the Proposed Projects are anticipated to be minimal, as activities would be designed to minimize impacts on these resources; however, permanent and temporary adverse impacts on sensitive communities have the potential to occur. Additionally, the change in water flows associated with the Proposed Projects have the potential to modify existing riparian vegetation growing along the stream reaches in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas; however, the *Riparian Vegetation Monitoring Plan* is designed to monitor the loss of riparian vegetation (PG&E 2011). According to this plan, if a significant change or loss is documented as a result of the monitoring, consultation with the appropriate agencies is required to determine whether additional monitoring or adaptive management are necessary to minimize impacts on riparian vegetation.

Implementation of the IVMP would minimize impacts on sensitive communities by requiring annual employee training, avoidance of known sensitive biological areas, and measures to minimize the spread of non-native invasive species into sensitive communities. In addition, any projected impacts on sensitive communities would be discussed during the annual consultation meeting and vegetation management planning. During these steps, LOPs and avoidance measures would be discussed. The IVMP would minimize impacts associated with activities; however, supplemental measures may be needed to minimize impacts on sensitive communities to a less than significant level. To minimize additional potential impacts on sensitive communities,



including degradation or direct loss of habitat, implementation of the following measure would be required to reduce the adverse effects below a level of significance.

Permanent or temporary temporal loss of sensitive communities would be considered a significant impact. Any construction activities affecting sensitive communities would be assessed and permitted individually; however, MM-COMMS-1 and MM-COMMS-2 set a minimum standard for no-net-loss of sensitive communities for future activities.

Implementation of the measures would mitigate the potential permanent impacts on these resources to a level that is less than significant.

Mitigation Measure:

MM-COMMS-1 Riparian, Wetlands, and Aquatic Resources Management Plan. A Riparian, Wetlands, and Aquatic Resources Management Plan shall be developed and implemented to mitigate potential impacts attributable to Proposed Project activities, such as activities that have the potential to cause permanent, temporary, or temporal impacts on aquatic resources, wetlands, and riparian areas associated with the Proposed Projects. The Riparian, Wetlands, and Aquatic Resources Management Plan shall, at a minimum, include:

- Protocols used to delineate riparian and wetland areas and description of avoidance and minimization measures to be implemented;
- Delineation or description of aquatic sensitive communities potentially affected by Proposed Project activities;
- Description of Proposed Project activities with the potential to affect sensitive communities;
- Adaptive management actions that will be implemented if water quality objectives are determined to be adversely affected by the Proposed Project activities; and
- Reporting to the State Water Board.

Mitigation for permanent impacts on aquatic resources, riparian, and wetland communities shall be provided at a minimum 1:1 ratio as described in the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (State Water Board 2019). Mitigation may include on-site restoration, in-lieu fee payment, or purchase of mitigation credits at an agency-approved mitigation bank. Mitigation as required in applicable regulatory permits obtained by PG&E from CDFW, USACE, or the Forest Service may be applied to satisfy this measure. Alternatively, mitigation coordinated with these agencies during the annual consultation meeting may be applied to satisfy this measure. For this measure, aquatic resources are defined as

waters protected under Sections 401 and Section 404 of the Clean Water Act and CDFW, Sections 1600–1603 of the California Fish and Game Code.

MM-COMMS-2 No Net Loss of Sensitive Communities. A qualified biologist shall conduct a site review (MM-BIO-1) prior to activities that could result in significant vegetation removal to determine whether sensitive communities such as sensitive quaking aspen or Rank S1–S3 communities as defined by Manual of California Vegetation, Second Edition (Sawyer et al. 2009) could be affected. If sensitive communities are determined to be present, then impacts would be avoided to the greatest extent possible. Should permanent impacts on sensitive communities be required for maintenance, mitigation shall be provided at a minimum 1:1 ratio. Mitigation may include on-site restoration, in-lieu fee payment, or purchase of mitigation credits at an agency-approved mitigation bank. Mitigation, including a determination that no mitigation is needed, as required through coordination with the Forest Service, or agreed upon during the annual consultation meeting, will satisfy this measure.

Implementation of MM-COMMS-1 and MM-COMMS-2 would fully mitigate permanent impacts on sensitive communities, including riparian vegetation, wetlands, and quaking aspen, by setting a standard of no net loss. Implementation of the aforementioned mitigation measures would reduce impacts on sensitive communities to a less than significant level.

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?

Potentially significant unless mitigation incorporated.

A delineation of aquatic resources in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas has not been conducted; however, aquatic resources could be affected by Proposed Project activities if they occur in or near disturbance areas. The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas include a variety of aquatic resources such as reservoirs, wetlands, and perennial, intermittent, and ephemeral streams.

Impacts on aquatic resources resulting from Proposed Project activities have not been quantified; however, Proposed Project activities would be designed to avoid impacts on these resources. Despite this, there is the potential for Proposed Project activities to affect federally or state protected aquatic resources, if they occur in or near disturbance areas. Some activities are likely to require in-water work, which could result in permanent or temporary impacts on aquatic resources. Specifically, Proposed Project activities have the potential to affect aquatic resources through habitat alteration,



sedimentation, dewatering, direct loss, or other effects to water quality; therefore, a standard of no net loss of federally or state protected waters would be established. *Permanent, temporal, and temporary loss of aquatic resources or degradation of water quality would be considered a significant impact.*

Several of the aforementioned implementation plans, including the IVMP, the Riparian, Wetlands, and Aquatic Resources Management Plan, and the *Erosion and Sediment Control Management Plan*, would minimize impacts on aquatic resources by requiring avoidance when possible and implementing measures to reduce degradation of aquatic resources by reducing sedimentation and pollution (PG&E 2011). However, these plans are focused on avoidance and do not sufficiently mitigate for permanent loss of aquatic resources; thus, implementation of MM-COMMS-1 would reduce the impact to loss of aquatic resources to a less-than-significant level.

Implementation of the IVMP would minimize impacts on aquatic resources by requiring employee awareness training to train personnel in avoidance, revegetating disturbed areas, and avoiding known biologically sensitive areas including aquatic resources. The *Sediment Control Management Plan* would implement measures to reduce runoff caused by erosion (PG&E 2011). Additionally, mitigation measures MM-BIO-1 through MM-BIO-3 would reduce areas of disturbance to the smallest footprint feasible to avoid unnecessary encroachment into aquatic resources, require revegetation of disturbed areas to reduce Proposed Project-induced erosion, expand measures in the IVMP to privately owned lands by requiring annual employee training to educate workers on avoidance of aquatic resources, and require implementation of BMPs to limit degradation by erosion, sedimentation, or other harmful materials in aquatic resources. Finally, implementation of MM-COMMS-1 would fully mitigate for permanent or temporary loss of federally and/or state protected waters. Implementation of the aforementioned mitigation measures would reduce impacts on state and/or federally protected aquatic resources to a less than significant level.

Mitigation Measures: No additional mitigation 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 wildlife nursery sites?

Less than significant impact.

The streams and riparian corridors in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas likely provide migratory corridors and nurseries for fish and wildlife species, even though downstream dams as well as existing Proposed Projects' dams and other facilities preclude some movement and access to nursery

habitat, specifically for anadromous fish. Proposed Project activities, including changes in flow, are not anticipated to have an adverse effect on native resident fishes and their movement patterns as compared with existing conditions, and higher minimum in-stream flows are expected to benefit the movement of these fishes. Proposed Project activities requiring in-water work are anticipated to be minimal and largely temporary in nature and would not decrease the permeability of these movement corridors. The *Transportation Management Plan* includes provisions to provide for fish and aquatic passage, and proper stream function for all stream crossing construction activities or improvements associated with roads that cross aquatic resources identified as fish habitat areas (PG&E 2011). This would enhance the ability for fish to move under existing roads as these facilities are improved over the years.

Proposed Project activities are not expected to affect existing wildlife corridors or increase the ability or permeability of wildlife movement from existing conditions. Implementation of License Conditions No. 39, No. 40, and No. 41 would minimize impacts on wildlife movement. Forest Service 4(e) Condition No. 39 – Monitor Animal Losses in Canals will require wildlife mortality monitoring in canals, thereby informing the licensee, in consultation with CDFW, if additional mitigation measures are needed to address potential mortalities caused by wildlife trying to cross canals. Agency consultation and adaptive management is required as part of this condition. Forest Service 4(e) Condition No. 40 – Replacement of Wildlife Escape and Wildlife Crossing Facilities would help facilitate wildlife movement by upgrading wildlife crossing facilities. Additionally, Forest Service 4(e) Condition No. 41 – Wildlife Crossings – Drum and South Yuba Canals specifies that within 5 years of license issuance, at least 14 wildlife crossings would either be retrofitted or constructed along these canals to better facilitate movement for terrestrial species. Each of these conditions would help minimize wildlife mortalities and facilitate movement across the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Other Proposed Project activities are anticipated to have localized areas of disturbance that would not restrict regional movement or act as significant barriers to wildlife movement.

Implementation of the aforementioned conditions would minimize adverse impacts on aquatic and terrestrial wildlife movement when compared with existing conditions. Therefore, Proposed Project activities would have a less than significant impact on the movement of any native resident or migratory fish or wildlife species, established native resident or migratory wildlife corridors, or nursery sites. No additional mitigation is required.

Mitigation Measures: None required.

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

Less than significant impact.

The Proposed Projects are consistent with the *Placer County General Plan Update* (Placer County 2013) and the *Nevada County General Plan* (Nevada County 1996). Each plan specifies policies to protect water resources, wetland and riparian areas, fish and wildlife habitat, wildlife movement corridors, vegetation communities, open space for the preservation of natural resources, threatened and endangered species, and aquatic habitats. In addition, both plans include specific measures to preserve and protect oak trees and oak woodlands. A review of the policies included in both the *Placer County General Plan Update* and the *Nevada County General Plan* resulted in the determination that Proposed Project activities are consistent with these policies. The best faith effort would be made to adhere to local policies and plans, and no conflict is anticipated. This impact is considered less than significant.

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?

No impact.

The Placer County Conservation Program (PCCP) includes a *Habitat Conservation Plan* covering the western portion of Placer County. A portion of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas overlaps with the PCCP program area; however, the PCCP had not been adopted at the time this document was written.

Mitigation Measures: None required.

3.4.3 References

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3.5 Cultural Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 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 § 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 dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.5.1 Environmental Setting

Cultural resources is a term applied to historic period and prehistoric archaeological sites; historical buildings, objects, structures, records, manuscripts, or places; and places of traditional cultural or religious importance, regardless of their eligibility for listing on national, state, or local registers. Under CEQA Sections 21084.1 and 21083.2(l), potential adverse impacts on cultural resources that are listed on or eligible for listing on the California Register of Historical Resources (CRHR), or that are considered unique or significant regardless of their CRHR status, must be taken into account. CRHR listed or eligible resources, termed *historical resources*, include, but are not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. (Pub. Resources Code, § 5020.1(j).)

Properties that are listed in or eligible for listing in the CRHR include both prehistoric and historic period resources, are of local significance, include some California State Historical Landmarks and California Points of Historical Interest, or are resources that



have been listed in or formally determined to be eligible for listing in the National Register of Historic Places (NRHP). (See also Pub. Resources Code, § 5024.1.)

To help inform identification of cultural and tribal cultural resources within the Upper-Drum Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project Boundaries, PG&E conducted archaeological and historical built environment resources investigations between 2009 and 2011 as part of the FERC relicensing. The studies were documented in four cultural resources inventory and NRHP evaluation reports (Baker 2011; Baker and Maniery 2011; Maniery et al. 2011; Millet and Maniery 2011). These studies included background and archival research, field surveys, NRHP evaluations of certain resources, and reporting.

The studies documented 178 cultural resources within the overall footprint of the Proposed Upper Drum-Spaulding Project area, confirming that the Proposed Upper Drum-Spaulding Project is located on culturally sensitive lands. The cultural resources identified during these studies included 56 historical built environment resources, of which 9 were found eligible for listing on the NRHP, 45 are not NRHP eligible, and 2 were not evaluated for the NRHP; plus 122 historic period and prehistoric archaeological sites, of which 11 are NRHP eligible, 64 are not eligible, 46 have not been evaluated for listing on the NRHP, and 1 archaeological site could not be found during the field studies in the location described in the site record and plotted on the site location maps. Eight of the archaeological sites are components of the Spaulding Dam Construction Discontiguous Archaeological District, and 23 built environment resources are components of the Drum-Spaulding Hydroelectric System and Historic District that were also identified and documented during the relicensing studies.

The studies documented 57 cultural resources within the overall footprint of the Lower Drum Hydroelectric Project Boundary, confirming that the Proposed Lower Drum Project is located on culturally sensitive lands. The cultural resources identified during these studies include 23 historical built environment resources, of which 7 were found eligible for listing on the NRHP, 14 are not NRHP eligible, and 2 were not evaluated for the NRHP; plus 34 historic period and prehistoric archaeological sites, of which none have been determined to be NRHP eligible, 16 are not eligible, and 18 have not been evaluated for listing on the NRHP. Twelve of the built environment resources are components of the Drum-Spaulding Hydroelectric System and Historic District that were also identified and documented during the relicensing studies.

The State Historic Preservation Officer (SHPO) concurred with the findings of the cultural resources inventory and NRHP evaluation reports in letters dated May 18, 2012; December 21, 2012; and August 1, 2013. The cultural resources identified during these studies were not evaluated specifically for listing on the CRHR. Although resources

listed on or determined to be eligible for listing on the NRHP are automatically listed on or eligible for the CRHR, it is possible to identify resources that are eligible for listing on the CRHR that do not meet the NRHP significance criteria.

Cultural history is often of great interest to the public. However, locational and other information about historical resources can result in irreparable vandalism or other damages to these resources. As a result, various state and federal regulations have been passed that allow for restrictions on confidential site location information and other information that could result in damage to these resources, including CEQA, Section 9 of the Archaeological Resources Protection Act of 1979 (ARPA; for federal lands), and Section 304 of the National Historic Preservation Act of 1966 (16 United States Code 4702-3), to name a few. Thus, the final technical reports of findings for the completed cultural resources studies are confidential, were filed with FERC as privileged, and are provided only on a need-to-know basis. Public summaries that describe the methods and results of these studies, but that omit any privileged information, are included in the Application for a New License (PG&E 2011).

3.5.1.1 Historic Properties Management Plan

Activities associated with the Proposed Projects have the potential to affect known and unknown cultural resources (for example, unrecorded resources that could be discovered during the term of the proposed new license) in the Upper Drum-Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project Boundaries that are potentially eligible for inclusion on CRHR. As part of the relicensing effort, PG&E developed a *Historic Properties Management Plan* (HPMP) (PG&E 2011) to guide the management of prehistoric and historic-period properties that are listed in, eligible for listing in, or that are unevaluated for listing in the NRHP, during the term of the proposed new license. The HPMP provides the procedures required to comply with federal and state laws and regulations and to conduct consultation with tribes, agencies, and SHPO for the continued management of historic properties under the proposed new license. These measures include avoidance, protection, monitoring, and mitigation measures. Properties that have not been evaluated for listing on the NRHP are to be managed as if they are eligible in the same manner as listed or eligible properties that have been formally evaluated. The HPMP was developed in consultation with Native American tribes, Tahoe National Forest, BLM, and SHPO.

3.5.2 Impact Analysis

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

Less than significant impact.

A substantial adverse change in the significance of a historical resource is defined in section 15064.5(b)(1) of the CEQA Guidelines as the “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.”

Of the 178 cultural resources identified by the relicensing studies within the Upper Drum-Spaulding Hydroelectric Project Boundary, 20 resources are listed on or eligible for listing on the NRHP and are, therefore, eligible for listing on the CRHR. Another 109 resources have not been evaluated for the NRHP, and a portion of these resources are components of the two historic districts that encompass parts of the Upper Drum-Spaulding Hydroelectric Project Boundary.

Moreover, architectural and engineered facilities and historic-era archaeological sites (for example, a trash dump dating to the 1970s) that were not 45 to 50 years of age at the time of the studies have reached the 50-year age criterion for consideration of effects and potential listing on the CRHR and NRHP, or will reach the 50-year age criterion after the new FERC licenses are issued. These resources will require formal recordation using the State Department of Resources (DPR) 523 forms and an assessment of each site's integrity to determine whether these resources are affected by, or will potentially be affected, by operations and maintenance associated with the Proposed Projects. In accordance with the terms of the HPMP, unevaluated historical resources will be managed as if they are NRHP eligible through avoidance. Avoidance means that no activities associated with activities associated with the Proposed Projects may occur at or to these resources not evaluated for the NRHP and/or the CRHR. This applies to activities within the boundaries of known or potential historical resources, including any defined buffer zones. Avoidance further means that the boundaries for potentially disturbing or destructive activities may need to be modified, redesigned, or eliminated to properly avoid historical resources. Buffer zones may be established around historic-period archaeological sites to ensure added protection from ground-disturbing activities if deemed necessary. Avoidance may include rerouting trails or roads to avoid historic-era archaeological sites, gating access roads to particularly sensitive areas to keep visitors away, or other means of restricting public access and disturbances associated with the Proposed Projects to protect historical archaeological resources. Avoidance of historical buildings or structures may include not replacing or

modifying characteristics that potentially make them eligible for the NRHP or CRHR. Implementing these avoidance measures ensures the archaeological sites will not be impacted by activities or public use and access associated with the Proposed Projects, and that the Proposed Projects will therefore not cause a substantial adverse change in the significance of a historical resource or require further mitigation measures.

Within the Proposed Upper Drum-Spaulding Project area, the Alta Powerhouse and the main Lake Spaulding Dam are both individually eligible for listing on the NRHP. The main Lake Spaulding Dam, the Lake Spaulding Dams 2 and 3, and the associated Lake Spaulding hydropower system features are all components of the NRHP-eligible Drum-Spaulding Hydroelectric System and Historic District. In following the measures of the HPMP, prior NRHP evaluations will be reviewed to ensure that the evaluations are still appropriate and to ensure that the Proposed Projects' potential impacts to potential historical resources are avoided or mitigated to less than significant levels. Operations and maintenance within the Proposed Lower Drum Project area are expected to continue as they have been conducted historically. The Jordon Creek Diversion Dam and any other unevaluated resources that have reached 50 years of age subsequent to the prior studies will be evaluated when activities associated with the Proposed Projects are found to have the potential to disturb or modify these resources. Effects of continued operations and maintenance to newly evaluated and previously evaluated resources that are eligible for listing on the NRHP and/or the CRHR will be assessed.

When impacts to historical resources are unavoidable, unevaluated resources will be evaluated for the NRHP and/or the CRHR through a testing or evaluation program (e.g., subsurface testing, archival research, etc.). Any resources determined eligible for the NRHP or CRHR that cannot be avoided by activities associated with the Proposed Projects will be mitigated to address significant impacts. The evaluations, assessment of effects, and treatments to mitigate adverse effects will follow the methods and procedures detailed in the *Historic Properties Evaluation and Treatment Plan* (HPETP), found in Appendix H of the HPMP. The HPETP (1) specifies the research themes and questions to be addressed through the recovery of archaeological, built environment, and traditional cultural property data; (2) specifies the methods to be used in fieldwork and analysis, and explains how these methods are relevant to the research design included in the HPETP; (3) specifies the methods to be used in data management and data dissemination; (4) indicates how recovered materials and records will be curated; and (5) provides for final reporting of the work and curation of all materials and records. The HPETP also details the site-specific measures to be conducted that are unique to each site that may undergo evaluation or mitigation as well as providing the steps necessary to implement mitigation based on the NRHP and CRHR criteria under which



a site is found eligible. The processes may include test excavation for NRHP/CRHR evaluations, data recovery excavations for historic-era archaeological sites, archival research of historical buildings and structures, signage, and other measures deemed appropriate based on the type of resources being addressed. The HPETP methods and protocols have been compiled in accordance with the principles, standards, and guidance contained in *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (USDOI 1983), the Advisory Council on Historic Preservation's (ACHP's) *Recommended Approach for Consultation on Recovery of Significant Information from Archeological Sites* (ACHP 1999), guidance offered by SHPO, and as appropriate, recommendations on a site by site basis from the Forest Service, BLM, BOR, and interested Native Americans. Evaluating historical resources, consulting with Tribes, land-managing agencies, and SHPO, and implementing agreed-to mitigation measures will ensure that planned, unavoidable impacts from the Proposed Projects to historical resources are mitigated prior to conducting impact-causing activities such that those impacts will not result in a substantial adverse change to the significance of a historical resource or require further mitigation measures.

PG&E plans to add new Primary Project Roads to the proposed new licenses for the Proposed Projects. These are roads that are used for area access that currently exist within the Upper Drum-Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project Boundaries. No new construction is planned, and the roads would continue to be used as they are currently. Some roads or road features (for example, bridges) have been evaluated as historically significant. If any Primary Project Road is identified as a historical resource and planned disturbances or modifications need to occur to maintain these roads during the term of the proposed new license, then implementation of the measures in the HPMP would be necessary to ensure that historical resources are identified and avoided. If planned disturbances or modifications to the roads cannot avoid a historical resource, then unevaluated resources will be evaluated, the potential effects will be addressed, and significant changes to the character of historical resources will be mitigated following the HPMP and HPETP procedures discussed above. Evaluating historical resources, consulting with Tribes, land-managing agencies, and SHPO, and implementing agreed-to mitigation measures will ensure that planned, unavoidable Project impacts to a historical resource are mitigated prior to conducting planned disturbances or modifications such that those impacts will not result in a substantial adverse change to the significance of a historical resource or require further mitigation measures.

Project operation or maintenance, erosion, and recreation could expose and damage previously unidentified historic-era archaeological sites. In addition, known sites may

reveal characteristics that were previously unknown if new portions of these sites are exposed. The HPMP provides the measures to address inadvertent discoveries (i.e., the unexpected exposure of previously unknown and unrecorded archaeological sites) during the terms of the new licenses. These measures require that all work in the immediate area of the discovery cease immediately and that all artifacts remain in place until the discovery can be examined by a qualified archaeologist to determine whether the find is an isolated artifact, an archaeological site, or a finding of no concern (i.e., not 45-50 years of age). Isolated historic-era artifacts and archaeological sites unexpectedly discovered are to be documented on the DPR 523 forms and avoided by further ground-disturbance. The SHPO, BOR, BLM, Forest Service, and the Tribes will be notified of the inadvertent discovery within 48 hours of the discovery, in accordance with 36 CFR 800.13(b)(3). The notification will describe any assessment of NRHP eligibility (formal or informal), the recommended actions to be undertaken to resolve potential adverse effects, and to seek consultation on the recommendations or other ways to avoid, minimize, or mitigate potential impacts to the discoveries. Per 36 CFR 800.13(b)(3), the Tribes and SHPO will have 48 hours to respond to the notification. If avoidance is not feasible, the measures to address unavoidable impacts will be implemented as provided for in the HPMP and HPETP and as discussed above.

Minor ground disturbances within the Proposed Upper Drum-Spaulding Project area related to modifications, vegetation management, road maintenance, construction, and use, recreation, or emergency repairs to flow releases, and that may be required for routine maintenance activities have the potential to cause substantial adverse changes to currently unidentified, buried historic-era archaeological sites and known archaeological sites in close proximity to these activity areas. Ground disturbances related to the continued operations and maintenance of the Proposed Lower Drum Project have the potential to cause substantial adverse changes to currently unidentified, buried historic-era archaeological sites and known archaeological sites in close proximity to these activities. Archaeological and/or tribal monitoring will be implemented in accordance with the measures provided in the HPMP. Regular monitoring will provide feedback concerning the condition of historical resources, confirming that the resources have been avoided as planned, or signaling when additional management measures may be called for. All potential historical resources located within the Area of Potential Effect (APE) for which eligibility has not yet been determined will be monitored by a qualified, professional archaeologist. The frequency of monitoring shall be based on considerations of accessibility, site type, and proximity to features and recreational use areas associated with the Proposed Projects, and is the product of consultation with Tribes and agencies, as appropriate. If a previously recorded site is determined ineligible it will no longer be monitored or managed through



the HPMP. However, if a previously unrecorded site is identified, it will be assumed eligible and, in consultation with Tribes and agencies, avoided and assigned a monitoring schedule.

In addition to regular site-specific monitoring, archaeological and/or tribal monitoring may be appropriate in cases of ground disturbance within 30 feet of NRHP- or CRHR-eligible or unevaluated resources.

An annual report summarizing the results of all monitoring activities during the preceding calendar year will be prepared and distributed to consulting parties by March 1 of each year. The report shall include written descriptions of any disturbances that were observed at each site monitored. An annual cultural resources consultation meeting with Tribes, land-managing agencies, and SHPO will also be held in March of each year, in part to discuss the monitoring report. Based on the results of monitoring presented in the report, the meeting will include a discussion of any proposals to increase or decrease monitoring frequency in response to recent site conditions. Any agreed upon changes in site monitoring frequency will be appended to the beginning of the HPMP monitoring plan and submitted to Tribes and agencies (as appropriate) as an errata sheet.

The HPMP further provides for annual cultural resources education and sensitivity training for PG&E staff and contractors, including all heavy equipment operators and other ground crew members working on the Proposed Projects. Training personnel in the procedures required to avoid unplanned impacts to archaeological resources will help to avoid inadvertent disturbances, allow for the evaluation and potential mitigation of impacts prior to historical resources being disturbed or destroyed, thereby resulting in the Proposed Projects having a less than significant impact to the archaeological resources.

Because the future recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis. These projects will require discretionary approvals and environmental analysis prior to any construction activities.

Mitigation Measures: None required.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Less than significant impact.

As provided for in section 15064.5(c)(1) of the CEQA Guidelines, a lead agency shall first determine whether an archaeological site is a historical resource, as defined at section 15604.5(a) of the CEQA Guidelines, when it is found that a project would affect that resource. According to section 15064.5(c)(3) of the CEQA Guidelines, "if an archaeological site does not meet the criteria defined in subdivision (a), but does meet the definition of a unique archeological resource in Section 21083.2 of the Public Resources Code, the site shall be treated in accordance with the provisions of section 21083.2." If archaeological resources are determined to be either historical resources or unique archaeological resources, then the effects of the project on those resources must be analyzed.

The cultural resources studies completed for the relicensing identified 122 archaeological sites within the Proposed Upper Drum-Spaulding Project area, for which the NRHP eligibility of 46 of these sites has not been determined. The cultural resources studies completed for the relicensing identified 34 archaeological sites within the Proposed Lower Drum Project area, for which the significance and CRHR or NRHP eligibility of 18 of these sites have not been determined, and there are no archaeological sites that have been determined to be eligible for listing in the CRHR. In accordance with the terms of the HPMP, unevaluated archaeological sites will be managed as if they are NRHP eligible through avoidance. Avoidance means that no activities associated with ground-disturbing activities associated with the Proposed Projects may affect archaeological sites, nor shall any ground-disturbing activities occur within the boundaries of known or potential historical resources, including any defined buffer zones. Avoidance further means that the boundaries for ground-disturbing activities may need to be modified, redesigned, or eliminated to properly avoid archaeological sites. Buffer zones may be established around archaeological sites to ensure added protection if deemed necessary. Moreover, avoidance may include rerouting trails or roads to avoid archaeological sites, gating access roads to particularly sensitive areas to keep visitors away, or other means of restricting public access and disturbances to protect archaeological sites. Implementing these avoidance measures ensures the archaeological sites will not be impacted by the ground-disturbing activities or public use and access, and that the Proposed Projects will therefore not cause a substantial adverse change in the significance of an archaeological resource or require further mitigation measures.



Additionally, there is the potential for currently unidentified archaeological sites to be discovered on the Proposed Projects during the term of the proposed new licenses. Operation or maintenance of the Proposed Projects, erosion, and recreation could expose and damage previously unidentified cultural resources. In addition, known cultural resources may reveal characteristics that were previously unknown if new portions of these sites are exposed. The HPMP provides the measures to address inadvertent discoveries (i.e., the unexpected exposure of previously unknown and unrecorded archaeological sites) during the terms of the new licenses. These measures require that all work in the immediate area of the discovery cease immediately and that all artifacts remain in place until the discovery can be examined by a qualified archaeologist to determine whether the find is an isolated artifact or an archaeological site. Isolated artifacts and archaeological sites unexpectedly discovered are to be documented on the DPR 523 forms and avoided by further ground-disturbance. The SHPO, BOR, BLM, Forest Service, and the Tribes will be notified of the inadvertent discovery within 48 hours of the discovery, in accordance with 36 CFR 800.13(b)(3). The notification will describe any assessment of NRHP eligibility (formal or informal), the recommended actions to be undertaken to resolve potential adverse effects, and to seek consultation on the recommendations or other ways to avoid, minimize, or mitigate potential impacts to the discoveries. Per 36 CFR 800.13(b)(3), the Tribes and SHPO will have 48 hours to respond to the notification. If avoidance is not feasible, the measures to address unavoidable impacts will be implemented as provided for in the HPMP and HPETP.

Avoidance and protection are not always possible. When planned impacts to archaeological sites are unavoidable, unevaluated resources will be evaluated for the NRHP through a testing or evaluation program (e.g., subsurface testing, archival research, etc.). Any sites determined eligible for the NRHP or CRHR that cannot be avoided by activities associated with the Proposed Projects will be mitigated to address significant impacts. The approaches and methods detailed in the HPETP will be used for both NRHP evaluation and mitigation at archaeological sites, including test excavation for NRHP evaluations, data recovery excavations, archival research, signage, and other measures deemed appropriate to the type of resource being evaluated and the type of impacts being mitigated. The HPETP details site-specific measures that are unique to each site that may undergo evaluation or mitigation as well as providing the steps necessary to implement mitigation based on the NRHP and CRHR criteria under which a site is found eligible. The HPETP methods and protocols have been compiled in accordance with the principles, standards, and guidance contained in *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (USDOI 1983), the Advisory Council on Historic Preservation's

(ACHP's) *Recommended Approach for Consultation on Recovery of Significant Information from Archeological Sites* (ACHP 1999), guidance offered by SHPO, and as appropriate, recommendations from the Forest Service, BLM, BOR, and interested Native Americans on a site by site basis. Evaluating archaeological sites, consulting with Tribes, land-managing agencies, and SHPO, and implementing agreed-to mitigation measures will ensure that planned, unavoidable impacts on archaeological sites from the Proposed Projects will be addressed prior to impacting the sites, and the Proposed Projects therefore will not cause a substantial adverse change in the significance of an archaeological resource or require further mitigation measures.

Minor ground disturbances within the Proposed Upper Drum-Spaulding Project area related to modifications, vegetation management, road maintenance, construction, and use, recreation, or emergency repairs to flow releases, and that may be required for routine maintenance activities have the potential to cause substantial adverse changes to currently unidentified, buried archaeological sites and known archaeological sites in close proximity to these activity areas. Ground disturbances related to the continued operations and maintenance of the Proposed Lower Drum Project have the potential to cause substantial adverse changes to currently unidentified, buried archaeological sites and known archaeological sites in close proximity to these activities. Archaeological and/or tribal monitoring will be implemented in accordance with the measures provided in the HPMP. Regular monitoring will provide feedback concerning the condition of historical resources, confirming that sites have been avoided as planned, or signaling when additional management measures may be called for. All potential historic properties located within the APE for which eligibility has not yet been determined will be monitored by a qualified, professional archaeologist. The frequency of monitoring shall be based on considerations of accessibility, site type, and proximity to features and recreational use areas associated with the Proposed Projects, and is the product of consultation with Tribes and agencies, as appropriate. If a previously recorded site is determined ineligible it will no longer be monitored or managed through the HPMP. However, if a previously unrecorded site is identified, it will be assumed eligible and avoided and, in consultation with Tribes and agencies, assigned a monitoring schedule.

In addition to regular site-specific monitoring, archaeological and/or tribal monitoring may be appropriate in cases of ground disturbance within 30 feet of NRHP- or CRHR eligible or unevaluated resources. Anytime an archaeologist monitors ground disturbing activities in proximity to prehistoric resources, Tribes shall be invited to participate.

An annual report summarizing the results of all monitoring activities during the preceding calendar year will be prepared and distributed to consulting parties by March 1 of each year. The report shall include written descriptions of any disturbances that



were observed at each site monitored. An annual cultural resources consultation meeting with Tribes, land-managing agencies, and SHPO will also be held in March of each year, in part to discuss the monitoring report. Based on the results of monitoring presented in the report, the meeting will include a discussion of any proposals to increase or decrease monitoring frequency in response to recent site conditions. Any agreed upon changes in site monitoring frequency will be appended to the beginning of the HPMP monitoring plan and submitted to Tribes and agencies (as appropriate) as an errata sheet.

The HPMP further provides for annual cultural resources education and sensitivity training for PG&E staff and contractors, including all heavy equipment operators and other ground crew members working on the Proposed Projects. Training personnel in the procedures required to avoid unplanned impacts to archaeological resources will help to avoid inadvertent disturbances, and allow for the evaluation and potential mitigation of impacts prior to any disturbances or destruction, thereby resulting in the Proposed Projects having a less than significant impact on archaeological resources.

Because the future recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis. These projects will require discretionary approvals and environmental analysis prior to any construction activities.

Mitigation Measures: None required.

c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Less than significant impact.

Section 15064.5(d) of the CEQA Guidelines requires that the Proposed Projects address the potential for human remains, particularly Native American human remains, to be present within the Upper Drum-Spaulling Hydroelectric Project and Lower Drum Hydroelectric Project Boundaries. Consistent with state law, including section 7050.5 of the Health and Safety Code and section 5097.98 of the Public Resources Code, section 15064.5(d) and (e) of the CEQA Guidelines require the identification of known or likely burials or other locations of human remains and adherence to applicable state laws and regulations for the appropriate disposition of human remains, including in the event of accidental discovery. No human remains were identified or discovered during any of the relicensing studies. However, given the culturally sensitive nature of the lands within the Proposed Projects, and the presence of prehistoric-era occupation sites, it is possible that human remains could be discovered during the term of the proposed new license. Thus, the measures provided in the HPMP to address the discovery and

protection of human remains, in accordance with applicable state and federal laws, will be employed if human remains are encountered. Impacts would be less than significant, and no additional mitigation is required.

Within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, the modifications to flow releases, and routine maintenance activities, would occur within culturally sensitive areas and, therefore, have the potential to expose currently unidentified, buried human remains. Thus, the measures provided in the HPMP to address the discovery and protection of human remains, in accordance with applicable state and federal laws, will be employed if human remains are encountered. Impacts would be less than significant, and no additional mitigation is required.

Mitigation Measures: None required.

3.5.3 References

- Baker, Cindy L. 2011. *Built Environment Addendum Report to the National Register of Historic Places Evaluation, Pacific Gas and Electric Company's Drum-Spaulding Hydroelectric Project, FERC No. 2310 Nevada and Placer Counties, California*. Prepared by PAR Environmental Services, Inc., Sacramento. Prepared for Pacific Gas and Electric Company, San Francisco, and HDR Engineering, Inc., Sacramento. On file, California Historical Resources Information Center, North Central Information Center, Sacramento State University.
- Baker, Cindy, and Mary L. Maniery. 2011. *National Register of Historic Places Evaluation, Pacific Gas and Electric Company's Drum-Spaulding Hydroelectric Project, FERC No. 2310 Nevada and Placer Counties, California*. Prepared by PAR Environmental Services, Inc., Sacramento. Prepared for Pacific Gas and Electric Company, San Francisco, and HDR Engineering, Inc., Sacramento. On file, California Historical Resources Information Center, North Central Information Center, Sacramento State University.
- Maniery, Mary L., Marshall Millett, and John Philip Glover. 2011. *Cultural Resources Investigations of Pacific Gas and Electric Company's Drum-Spaulding Project, FERC No. 2310, Nevada and Placer Counties, California*. On file, Pacific Gas and Electric Company, San Francisco.
- Millett, Marshall, and Mary L. Maniery. 2011. *Addendum Report to the Cultural Resources Investigations of Pacific Gas and Electric Company's Drum-Spaulding Project, FERC No. 2310, Nevada and Placer Counties, California*. On file, Pacific Gas and Electric Company, San Francisco.
- Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020. <http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.



3.6 Energy

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 type="checkbox"/>	<input checked="" 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"/>

3.6.1 Environmental Setting

The Proposed Upper Drum-Spaulding Project consists of activities corresponding to relicensing operations at seven existing PG&E powerhouses that have a total plant capability of 147.1 MW of hydropower. The powerhouses in the Proposed Upper Drum-Spaulding Project area include the Spaulding No. 1, Spaulding No. 2, Spaulding No. 3, Alta, Drum No. 1, Drum No. 2, and Dutch Flat No. 1 Powerhouses. Routine maintenance activities within the Proposed Upper Drum-Spaulding Project area that would involve short-term consumption of energy resources would be generally limited to recreational facility maintenance, vegetation management, and road maintenance.

The Proposed Lower Drum Project consists of activities corresponding to relicensing operations at four existing PG&E powerhouses that have a total plant capability of 39.7 MW of hydropower. The powerhouses in the Proposed Lower Drum Project area include the Halsey, Wise, Wise No. 2, and Newcastle Powerhouses. Routine maintenance activities within the Proposed Lower Drum Project area that would involve short-term consumption of energy resources would be generally limited to recreational facility maintenance, vegetation management, and road maintenance.

3.6.2 Impact Analysis

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

No impact.

Construction activities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would result in the temporary consumption of energy from fuel use needed to operate equipment. The Proposed Projects would not be wasteful because the equipment would be used on a short-term basis and only when necessary. Further, the Proposed Projects would adhere to existing tiered emissions standards for off-road and construction equipment established by the U.S. Environmental Protection Agency and the California Air Resources Board.

Energy consumption for operations in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would not change from current energy use levels and would be limited to fuel consumption for operating the backup generators and auxiliary motors, for making vehicle trips for facility operation and maintenance, and for ensuring what is necessary from a health and safety perspective, which includes security lighting and availability of a potable water supply.

In summary, the Proposed Projects would have no impact, given the temporary nature of energy consumed during short-term maintenance activities and no change in operational conditions, so that no inefficient, wasteful, or unnecessary consumption of energy resources would be associated with the Proposed Projects. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

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

No impact.

The State of California's Clean Energy and Pollution Reduction Act (Ch. 547, Stats. 2015) establishes California's GHG emissions reduction target of 40 percent below 1990 levels by 2030, and 80 percent by 2050. Additionally, California's 100 Percent Clean Energy Act (Ch. 312, Stats. 2018) establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers by December 31, 2045.

The Proposed Projects would include a reduction in energy generation from existing PG&E hydroelectric facilities caused by more water being allocated for various



environmental measures (i.e., higher minimum instream flows, ramping rates, and recreation flows) and the retirement of Alta Unit 2. FERC's (2014) FEIS estimated these changes would result in a loss of 61,400 MWh for the Upper Drum-Spaulding Project and 13,300 MWh for the Lower Drum Project, a total of 74,700 MWh. PG&E estimates their 110 hydropower generating units produce an average of 11,672,000 MWh annually (PG&E 2010); therefore, the loss of power generation for the Proposed Projects to PG&E's overall portfolio is less than one percent. From a broader perspective, the California Energy Commission (2019) estimates 34,476,300 MWh of power are produced annually from hydropower in California so the loss of power production from the Proposed Projects is less than one quarter of one percent. Therefore, although the Proposed Projects include a reduction in hydroelectric power generation, this decrease in hydroelectric power generation would not result in an increase in fossil fuel use. This decrease was determined by PG&E to strategically fit within PG&E's entire energy portfolio to create the most efficient use of PG&E facilities. Efficiency in this determination reflects the balance between costs to operate facilities and meeting customer needs for energy supply. Therefore, the Proposed Projects would not affect existing availability of renewable energy sources. In addition, operation of the Proposed Projects would not change the power generation capacity of the existing powerhouses. Therefore, the Proposed Projects would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

3.6.3 References

- California Energy Commission. 2019. California Hydroelectric Statistics and Data. Accessed November 24, 2020. https://ww2.energy.ca.gov/almanac/renewables_data/hydro/index_cms.php#:~:text=The%20annual%20average%20hydroelectric%20generation,referred%20to%20as%20small%20hydro.
- Federal Energy Regulatory Commission (FERC). 2014. Final Environmental Impact Statement for Hydropower License. Accessed November 12, 2020. https://elibrary.ferc.gov/eLibrary/filelist?document_id=14283202&optimized=false
- Pacific Gas and Electric (PG&E). 2010. Hydro Operations Program Costs. Accessed November 24, 2020. [https://www.pge.com/regrel-public/GRC2007NOI/GRC2007-Ph-I_Test_PGE_20050000-00-Exh003-Ch03.doc#:~:text=PG%26E's%20hydro%20system%20consists%20of,hours%20\(GWh\)%20per%20year.](https://www.pge.com/regrel-public/GRC2007NOI/GRC2007-Ph-I_Test_PGE_20050000-00-Exh003-Ch03.doc#:~:text=PG%26E's%20hydro%20system%20consists%20of,hours%20(GWh)%20per%20year.)

3.7 Geology and Soils

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 type="checkbox"/>	<input checked="" type="checkbox"/>
iii. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 type="checkbox"/>	<input checked="" type="checkbox"/>



Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risk to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.7.1 Environmental Setting

The Proposed Projects are located in Placer and Nevada Counties in California. Placer and Nevada Counties are part of the Sierra Nevada Range and contain forested foothills and steep terrain with exposed granite. The eastern portion of Nevada County contains Mesozoic Jura-Trias Metavolcanic and Mesozoic Granitic formations. The central portion of Nevada County contains Paleozoic Marine Metasedimentary and Cenozoic Volcanic formations. The western portion of Nevada County contains Cenozoic Volcanic and Mesozoic Granitic formations (DOC 2010; Nevada County 1991).

Soil types vary across Placer and Nevada Counties and the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas. Soil types have varying characteristics such as permeability, stability, erosion hazards, or agricultural capability.

3.7.2 Impact Analysis

a-i) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving 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?

No impact.

Several late quaternary and undifferentiated quaternary faults exist in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. These faults are part of the Foothill Fault System (U.S. Geological Survey 2020). However, the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are not located in an earthquake fault hazard zone (California Geological Survey [CGS] 2019). Therefore, the Proposed Projects would not result in substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist or based on other substantial evidence of a known fault. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

a-ii) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking?

No impact.

Activities included in the Proposed Projects are located in areas with low levels of potential for seismic shaking (CGS 2016). Therefore, the Proposed Projects would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

a-iii) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction?

No impact.

Liquefaction can occur when earthquake motion turns loosely packed, water-saturated soil to liquid, which causes a loss in support for structures. Activities included in the Proposed Projects are located in areas that have not been evaluated for liquefaction (CGS 2019). However, the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are not located in an earthquake hazard zone (CGS 2019).



Therefore, the Proposed Projects would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

a-iv) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving landslides?

No impact.

Activities included in the Proposed Projects are located in an area that has not been evaluated for landslides (CGS 2019). Steep slopes near rivers do exist in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, which would decrease soil stability in those areas. However, the Proposed Projects would not involve intensive land development, grading, or construction work, and therefore would not disturb steep slopes. Further, any surface disturbance of greater than one acre would be managed by a *Stormwater Pollution Prevention Plan* (SWPPP). Therefore, the Proposed Projects would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

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

Potentially significant unless mitigation incorporated.

Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project activities would consist of routine maintenance and ongoing operations and would not result in a large increase in impervious surfaces, which could cause increased erosion downslope. Additionally, for any maintenance activities disturbing more than one acre of ground, erosion control methods would be implemented as part of a SWPPP, if needed, to control runoff through requirements in section XIII.A. of the California NPDES Construction General Permit (State Water Board 2012). Because the future recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis.

Routine maintenance and ongoing operations of the Proposed Projects may have the potential to cause erosion. Soil erosion can be mitigated by implementing standard BMPs for all maintenance activities, even for projects not required to have a SWPPP. With implementation of MM-GEO-1, the Proposed Projects' potential impacts

associated with substantial soil erosion or loss of topsoil would be reduced to a less-than-significant level.

Mitigation Measures:

MM-GEO-1: Implement Standard Best Management Practices. The following standard BMPs will be implemented during routine maintenance:

- All heavy equipment, vehicles, and work activities will be confined to existing roads, road shoulders, and disturbed/developed or designated work areas. Work areas will be limited to what is necessary to complete work to the extent reasonably possible.
- Vehicular speeds will be limited to 15 miles per hour on unpaved roads.
- Control measures for erosion, excessive sedimentation, and sources of turbidity will be implemented and in place prior to the commencement of, during, and after any ground clearing activities, excavation, or any other activities that could result in erosion or sediment discharges to surface water.
- Caution will be used when handling and/or storing chemicals (for example, fuel, hydraulic fluid) near waterways. The Proposed Projects will comply with any and all applicable laws and regulations related to the handling and storage of chemicals. Appropriate materials will be on site to prevent and manage spills.
- When not in use, equipment will be stored in upland areas outside the boundaries of waterways.
- All equipment will be inspected for leaks before being brought on site. All equipment will be well-maintained and inspected daily while on site to prevent leaks of fuels, lubricants, or other fluids into waters of the United States or waters of the state. Stationary equipment (for example, generators) within 100 feet of aquatic habitat will be parked over secondary containment.
- Service and refueling procedures will be conducted in a designated area where no potential exists for fuel spills to seep or wash into waterways.
- Stockpiles will be located outside of riparian habitat and protected with appropriate stockpile management BMPs. If more than 0.25 inch of rain is forecast during work periods, all spoil piles will be covered with plastic and surrounded with sediment control technologies or berms to prevent sediment runoff.



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?

No impact.

Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project activities would involve minor grading work associated with routine maintenance. Steep slopes susceptible to landslides do exist in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. However, maintenance activities would take place in generally flat areas and would not take place on slopes that could potentially be unstable. Because the future recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis.

Ongoing operations of the Proposed Projects would not alter the landscape from its current existing state. Changes in operations of the Proposed Projects would result in flows remaining within the existing minimum and maximum flow levels and, thus, no change in the physical conditions would occur.

Therefore, there would be no change in existing conditions attributable to operations, and maintenance activities associated with the Proposed Projects would avoid unstable areas; future separate analysis may be needed for currently undefined construction activities. Additionally, the Proposed Projects would not result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. As a result, no impact would occur as a result of the Proposed Projects and no mitigation is required.

Mitigation Measures: None required.

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

No impact.

Routine maintenance and ongoing operations of the Proposed Projects would not involve any subsurface work. Therefore, the Proposed Projects would not create any new substantial direct or indirect risk to life or property because of expansive soils. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

- e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?***

No impact.

No new septic tanks or alternative wastewater disposal systems would be constructed as part of the Proposed Projects. Because the future recreation facility improvements would be defined through future planning, those projects will be analyzed separately and are not part of this scope of analysis. Therefore, the Proposed Projects would not locate septic tanks or alternative wastewater disposal systems on soils incapable of adequate support. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

- f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?***

Potentially significant unless mitigation incorporated.

The Proposed Projects would involve minor ground disturbance during routine maintenance work and ongoing operations. Although much of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas have been previously disturbed, unique paleontological or geologic features could be discovered during minor ground disturbing activities, which would be considered a significant impact. MM-GEO---2 would be implemented to minimize impacts resulting from the potential for discovery of buried paleontological resources during maintenance.

Long-term operations within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would not result in additional ground-disturbing activities and, therefore, would not have the potential to encounter unique paleontological or geologic resources.

With implementation of MM-GEO-2 during maintenance activities and ongoing operations, the Proposed Projects' potential to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature would be reduced to a less-than-significant level.

Mitigation Measures:

MM-GEO-2: Paleontological Resources. Before the start of maintenance activities, personnel involved with ground-disturbing activities shall be informed of the proper notification procedures if fossils are encountered. If paleontological resources are

encountered during ground-disturbing activities, the work crew shall immediately stop work and a qualified paleontologist shall evaluate the resource and prepare a proposed mitigation plan based on the situation prior to continuation of the activity.

3.7.3 References

- California Department of Conservation (DOC). 2010. "Geologic Map of California." Accessed January 14, 2020. <https://maps.conservation.ca.gov/cgs/gmc/>.
- California Geological Survey (CGS). 2016. "Earthquake Shaking Potential for California." Accessed January 14, 2020. https://www.conservation.ca.gov/cgs/Documents/MS_048.pdf.
- . 2019. "Earthquake Zones of Required Investigation. Updated April 4, 2019. Accessed January 14, 2020. <https://maps.conservation.ca.gov/cgs/EQZApp/app/>.
- Nevada County. 1991. "Nevada County Master Environmental Inventory." Accessed January 14, 2020. <https://www.mynevadacounty.com/DocumentCenter/View/12595/Volume-3-General-Plan-Master-Environmental-Inventory-PDF>.
- State Water Resources Control Board (State Water Board). 2012. "National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities." Order No. 2009-0009-DWQ. NPDES No. CAS000002. Accessed January 23, 2020. https://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.
- U.S. Geological Survey. 2020. "U.S. Quaternary Faults." Accessed January 14, 2020. <https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf>.

3.8 Greenhouse Gas Emissions

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 type="checkbox"/>	<input checked="" type="checkbox"/>

3.8.1 Environmental Setting

California's efforts devoted to GHG emissions reductions and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHGs related to human activity that include carbon dioxide (CO₂), methane (CH₄), nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Public agencies use significance thresholds to indicate how they plan to evaluate and characterize the severity of various environmental impacts that could be associated with discretionary projects that they review. Significance thresholds are also used to help identify the level of mitigation needed to reduce a potentially significant impact to a less than significant level and to determine what type of an environmental document should be prepared for a project—a negative declaration, an MND, or an environmental impact report.

The Proposed Upper Drum-Spaulding Project is located in Placer and Nevada Counties, while the Proposed Lower Drum Project is located in Placer County. Facilities within Placer County are within the PCAPCD, while facilities within Nevada County are within the NSAQMD.



The PCAPCD CEQA Handbook defines a significance threshold of 1,100 metric tons (MT) of carbon dioxide equivalent (CO₂e) for the operational phase of land use projects. As routine maintenance activities are temporary, no significance threshold was applied to their potential impacts.

The NSAQMD CEQA Guidelines do not suggest a GHG emission threshold. Instead, the guidelines refer the reader to the California Air Pollution Control Officers Association (CAPCOA) guidance. CAPCOA has not suggested a GHG threshold of significance but presented a rationale for a 900 MT of CO₂e per year CEQA threshold in its 2010 guidance document, *Quantifying Greenhouse Gas Mitigation Measures*. Consistent with Nevada County, no significance threshold is recommended for temporary maintenance impacts.

GHG emissions generated by the Proposed Projects would be primarily in the form of CO₂ and CH₄ from maintenance equipment and haul and commute vehicle exhaust.

Operational GHG emissions from routine maintenance and existing operations of the Proposed Projects would not increase over existing conditions.

3.8.2 Impact Analysis

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

Less than significant impact.

For the purposes of this environmental review, 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.

Routine maintenance-related GHG emissions would be associated with engine exhaust from construction equipment, haul trucks, and worker commute trips. However, routine maintenance activities and ongoing operations would not change GHG emissions over existing conditions. Further, as noted above, no thresholds for construction GHG emissions have been set by the PCAPCD and NSAQMD. Therefore, there would be a less than significant impact from maintenance-related emissions.

As discussed in Section 3.6, *Energy*, the Proposed Projects would result in a reduction of power generation however this reduction is equivalent to less than one quarter of one percent of the overall energy production from hydropower in California. Given this fractional loss in overall hydropower generation replacement with energy sources that may increase GHG emissions is unlikely. Further, California continues to see increases in solar generation (and other renewables) that would help to offset this small reduction in hydropower generation from the Proposed Projects.

Therefore, the Proposed Projects would be consistent with the applicable GHG emission reduction strategies identified by the State's *Climate Action Plan* and the Climate Action Team. As a result, the Proposed Projects would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The impact would be less than significant and no mitigation is required.

Mitigation Measures: None required.

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

No impact.

The California Renewables Portfolio Standard program, which was established primarily 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 forecast to procure 50 percent of electricity sales from renewable energy sources by 2020—17 percent above the mandated requirement. Implementation of the Proposed Projects would not affect PG&E's current ability to procure electricity sales from renewable energy sources. As discussed in Section 3.6, *Energy*, the reduced power generation of the Proposed Projects is less than one percent of PG&E's overall hydropower production. Further, only about three percent of PG&E's overall energy portfolio comes from small hydroelectric power that qualifies as renewable energy in California (PG&E 2019). Therefore, the Proposed Projects would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. There would be no impact and no mitigation is required.

Mitigation Measures: None required.

3.8.3 References

California Air Pollution Control Officers Association (CAPCOA). 2010. "Quantifying Greenhouse Gas Mitigation Measures – A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures."

August 2010. <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>

Pacific Gas and Electric (PG&E). 2019. Power Content – Where Your Electricity Comes From. Accessed November 24, 2020. https://www.pge.com/pge_global/common/pdfs/your-account/your-bill/understand-your-bill/bill-inserts/2019/1019-Power-Content-Label.pdf



3.9 Hazards and Hazardous Materials

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 accident conditions involving the likely 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 one-quarter 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"/>

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless 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 two 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"/>

3.9.1 Environmental Setting

Activities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would involve minor use of common construction materials such as fuel, oil and grease, surfactants, and herbicides during construction activities. It is not anticipated that there would be changes in potential hazardous materials used during operations or maintenance as a result of implementation of the Proposed Projects. Waste from maintenance activities is not anticipated to be hazardous; however, if hazardous materials were encountered, they would be disposed of at approved facilities in accordance with all applicable state and federal regulations.

3.9.2 Impact Analysis

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

Less than significant impact.

Activities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would use fuel for maintenance and operation of vehicles, and herbicide for the management of noxious weeds in the IVMP (PG&E 2011). However, the transport, use, or disposal of these materials would not be a change from current conditions. Waste is not anticipated to be hazardous; however, if hazardous materials are encountered, they would be transported and disposed of at approved facilities in accordance with applicable laws and regulations, including the federal Resource Conservation and Recovery Act (42 U.S.C. §§ 6901-6992) and California's Hazardous Waste Program administered by the Department of Toxic Substances Control. The Proposed Projects would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. As a result, the impacts are less than significant and no mitigation is required.

Mitigation Measures: None required.

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

Less than significant impact.

The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project include activities that would use materials that may be hazardous to the environment during routine maintenance activities and operations of the facilities. Minimal storage of these materials would occur. No other actions associated with operation of the hydropower facilities would generate a foreseeable event that would release hazardous materials into the environment, considering the aforementioned hazardous materials laws and safety regulations in place. As a result, impacts would be less than significant, and no mitigation is required.

Mitigation Measures: None required.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No impact.

No schools are located within one-quarter mile of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Therefore, there would be no impacts from hazardous materials to schools within one-quarter mile of the Proposed Projects and no mitigation is required.

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?

No impact.

No cleanup sites listed in the ENVIROSTOR database are located in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project construction and operation areas (ENVIROSTOR 2020). No solid waste disposal facilities listed by the California Regional Water Quality Control Boards with waste constituents above hazardous waste levels outside the waste management unit are located in or near the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Wastewater Treatment facilities, mining sites, and landfills listed by the California Regional Water Quality Control Boards as having cleanup or abatement orders are not located within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. There are underground storage tanks (USTs) in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas along the Interstate 80 corridor (GEOTRACKER 2020). However, the majority of the UST sites in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are closed and cleanup is complete. Activities associated with the Proposed Projects would not change conditions at these sites. Others are not located in an area that would have maintenance or operations activities.

Activities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would not create a significant hazard to the public or environment because there would be no construction or ground-disturbing activities as part of maintenance or operation in proximity to closed or active UST sites. Therefore, the

Proposed Projects would have no impact on hazards to the public from hazardous sites and no mitigation is required.

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 two 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?

No impact.

The Aeroportul Blue Canyon – Nyack is located within two miles of the Proposed Upper Drum-Spaulding Project area. However, the Proposed Upper Drum-Spaulding Project activities would not include construction or new operations within two miles of Aeroportul Blue Canyon – Nyack.

Two airports are located within two miles of the Proposed Lower Drum Project area: the California Department of Forestry and Fire Protection (Cal Fire) Auburn Helipad and the Auburn Municipal Airport. However, the Proposed Lower Drum Project activities would not include construction or new operations within two miles of an airport.

Therefore, there would be no impact from the Proposed Projects on airport-related hazards or excessive noise toward people. As a result, no mitigation would be required.

Mitigation Measures: None required.

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

Less than significant impact.

As discussed in Section 3.17, *Transportation*, maintenance within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas could result in temporary access delays to short-term work areas, but access for emergency purposes would not be obstructed or impeded. According to the *Transportation System Management Plan* (PG&E 2011), emergency routes through the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would be kept open during maintenance and operations. Therefore, there would be less than significant impacts to emergency responses and evacuations, and no mitigation is required.

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?

Less than significant impact.

The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are located in State Responsibility Areas with Fire Hazard Severity Zones ranging from moderate to very high and in Federal Responsibility Areas (Cal Fire 2007).

Implementation of the *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) would ensure that the Proposed Projects would not exacerbate fire risks that already exist in the area. PG&E will implement measures such as signs for educating the public about fire danger and safety and restrictions on burning during times of very high and extreme fire danger to help reduce risk to people and structures in the area.

Workers and recreational users within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas would be in areas with potentially high fire danger; however, this is not a change from the existing conditions. Additionally, fire risks would be reduced by the implementation of measures in the *Fire Prevention and Response Plan on Federal Land* (PG&E 2011). Therefore, impacts on people or structures causing loss, injury, or death involving wildland fires would be less than significant. As a result, no mitigation would be required.

Mitigation Measures: None required.

3.9.3 References

Cal Fire. 2007. "Fire Hazard Severity Zones Maps." Accessed January 24, 2020.

<https://osfm.fire.ca.gov/divisions/wildfire-prevention-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/>.

ENVIROSTOR. 2020. "Department of Toxic Substances Control ENVIROSTOR Database." Accessed January 24, 2020.

https://www.envirostor.dtsc.ca.gov/public/profile_report?global_id=29100021.

GEOTRACKER. 2020. "Sites and Facilities." Accessed January 28, 2020.

<https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=gold+run>.

Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020.

<http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.



3.10 Hydrology and Water Quality

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water 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 erosion or siltation on- or off-site;	<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 offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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"/>

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.10.1 Environmental Setting

The Proposed Upper Drum-Spaulding Project area encompasses the watershed of the South Yuba River, Bear River, and North Fork of the American River between Kingvale and Gold Run. The Proposed Lower Drum Project area encompasses the watershed of the Bear River, Dry Creek, Rock Creek, and Auburn Ravine between Rollins Reservoir and Folsom Lake. The Proposed Projects' operational activities would be generally consistent with existing operations except for increased minimum instream flows and other environmental measures meant to be protective of resources including water quality and quantity. Some facilities including recreation areas, flow stations, and roads would be rehabilitated or constructed as described in Section 2, *Proposed Projects*. Site plans for facility upgrades, new construction, and the Jordan Creek Diversion Dam decommissioning have not yet been finalized, and those activities are not part of this of this analysis; those projects will require discretionary approvals and environmental analysis prior to any construction activities.

3.10.1.1 Beneficial Uses

Beneficial uses and associated water quality objectives for Proposed Projects' waterbodies are listed in the *Water Quality Control Plan* for the Sacramento and San Joaquin River Basins (Basin Plan) (CVRWQCB 2018). Beneficial uses include: municipal and domestic supply (MUN); irrigation; stock watering; hydropower generation; contact recreation, canoeing and rafting (REC-1); other noncontact water



recreation; cold freshwater habitat (COLD); cold water spawning, reproduction, and/or early development for salmon or steelhead (SPWN); warm freshwater habitat (WARM); and wildlife habitat. Numeric water quality objectives associated with beneficial uses are listed in Table 3-5, and narrative objectives are summarized in Table 3-6. Maintenance and operation facilities have the potential to impact beneficial uses and violate water quality objectives.

Table 3-5. Summary of Numeric Basin Plan Water Quality Objectives to Protect Beneficial Uses

Parameter	Water Quality Objective
Bacteria	Waters designated REC-1: the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than 10 percent of the total number of samples taken during any 30-day period exceed 400/100 ml.
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. For water designated for use as domestic or municipal supply (MUN), waters shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in Title 22 of the California Code of Regulations. Additionally, waters shall not contain lead in excess of 0.015 mg/L.
Dissolved Oxygen	For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time: Waters designated WARM: 5.0 mg/L Waters designated COLD: 7.0 mg/L minimum Waters designated SPWN: 7.0 mg/L minimum
pH	The pH shall not be depressed below 6.5 nor raised above 8.5.
Temperature	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5 °F) above natural receiving water temperature.

Table 3-5. Summary of Numeric Basin Plan Water Quality Objectives to Protect Beneficial Uses

Parameter	Water Quality Objective
Turbidity	<p>Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:</p> <ul style="list-style-type: none"> • Where natural turbidity is less than 1 NTU, controllable factors shall not cause downstream turbidity to exceed 2. • Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU. • Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. • Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs. • Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent. <p>In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses would be fully protected.</p>

Source: CVRWQCB 2018

Notes: °F = degrees Fahrenheit; mg/L = milligram per liter; ml = milliliter; NTU = nephelometric turbidity unit

Table 3-6. Summary of Narrative Basin Plan Water Quality Objectives to Protect Beneficial Uses

Parameter	Water Quality Objective
Biostimulatory Substances	Water shall not contain biostimulatory substances that promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.
Color	Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.
Floating Material	Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

Table 3-6. Summary of Narrative Basin Plan Water Quality Objectives to Protect Beneficial Uses

Parameter	Water Quality Objective
Pesticides	<ul style="list-style-type: none"> • No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. • Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses. • Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer. • Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12.). • Pesticide concentrations shall not exceed the lowest levels technically and economically achievable. • Waters designated for use as domestic or municipal supply shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15. • Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/L. • Any substance, or mixture of substances that is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or any spray adjuvant, or (3) any breakdown products of these materials that threaten beneficial uses. Note that discharges of "inert" ingredients included in pesticide formulations must comply with all applicable water quality objectives.
Radioactivity	Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Table 3-6. Summary of Narrative Basin Plan Water Quality Objectives to Protect Beneficial Uses

Parameter	Water Quality Objective
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Taste or Odor	Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Source: CVRWQCB 2018

Notes: C.F.R. = Code of Federal Regulations; µg/L = microgram per liter

Water quality throughout the Proposed Projects was in accordance with the following Basin Plan objectives: biostimulatory substances; chemical constituents; color; pesticides; floating material; oil and grease; and sediment and settleable solids based on existing specific water quality studies conducted by PG&E during the relicensing. The results of PG&E's water quality study are provided in detail in their Application for New License (PG&E 2011). There were three constituents found to be inconsistent with the Basin Plan objectives; bacteria, dissolved oxygen, and pH.

All of the 2008 bacteria samples collected by PG&E from the 20 recreation sites sampled had fecal coliform counts below the Basin Plan objective, but two sites had total coliform counts above the benchmark: the north shore campsites at Carr Lake (Proposed Upper Drum-Spaulding Project) and the informal campground boat launch at Lower Lindsey Lake (Proposed Upper Drum-Spaulding Project). These concentrations were confirmed by PG&E during the second year of sampling in 2009.

Dissolved oxygen (DO) levels in waters affected by the Proposed Projects was above the 7 milligrams per liter (mg/L) Basin Plan objective for cold water fisheries in most of the more than 100 samples collected during the relicensing. DO was less than the Basin Plan objective in the following stream reaches: 1) the reach below Lake Sterling dam (Proposed Upper Drum-Spaulding Project) in both spring and summer 2008, 2) the



reach below Lake Spaulding (Proposed Upper Drum-Spaulding Project) in fall 2009, and 3) the reach below Rock Creek Reservoir (Proposed Lower Drum Project) in summer 2009. DO levels were less than 7 mg/L in the following reservoirs: 1) Blue Lake (Proposed Upper Drum-Spaulding Project) in summer 2009 and 2) Lake Spaulding (Proposed Upper Drum-Spaulding Project) in summer and fall 2009. DO concentrations in reservoirs less than 7 mg/L occurred in the hypolimnion, when the reservoirs were stratified.

Measured pH values were within the Basin Plan objective of 6.5 to 8.5 standard units in most of the more than 100 samples collected. Measured pH levels were outside the Basin Plan objective in the Fordyce dam reach below Fordyce Lake (Proposed Upper Drum-Spaulding Project) and the Bowman-Spaulding conduit below Fuller Lake (Proposed Upper Drum-Spaulding Project). Within reservoirs, pH levels were less than 6.5 standard units in one sample from the hypolimnion of Blue Lake (Proposed Upper Drum-Spaulding Project) in summer 2008 and above 8.5 standard units near the bottom of Lake Spaulding (Proposed Upper Drum-Spaulding Project) in fall 2009.

3.10.2 Impact Analysis

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than significant impact.

During routine maintenance of the Proposed Projects, waste would be disposed of consistent with all applicable permits and approvals. In addition, if ground disturbance is greater than one acre, a SWPPP will be implemented to prevent sediment from eroding on site and causing sedimentation in nearby watercourses. Further, with the implementation of erosion and sediment control measures in MM-GEO-1, water quality would be preserved. Operations of the Proposed Projects would not substantially affect surface or groundwater quality.

As described above, surface water quality conditions are generally consistent with the Basin Plan objectives throughout the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. The Proposed Projects would generally operate as they do currently, except for higher minimum instream flows and associated environmental measures. Increased minimum instream flows were developed in collaboration with the resource agencies to be more protective of biological resources and water quality. The continued operation of the Proposed Projects would not contribute to discharges of substances that directly affect water quality.

Specific site plans for recreation facility upgrades, new construction, and the decommissioning of the Jordan Creek Diversion Dam have not yet been finalized, and those activities are not part of this analysis. Those projects will require discretionary approvals and environmental analysis prior to any construction activities. Required future approvals and environmental analysis would include assessing potential impacts on water quality and developing appropriate mitigation and/or monitoring requirements at that time.

The Proposed Projects would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality during maintenance or operations. Further, potential water quality impacts can be mitigated by implementing MM-GEO-1. As a result, the impact would be less than 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?

Less than significant.

The Proposed Projects would have a less than significant impact on groundwater supplies or recharge. Increased minimum instream flows for environmental protection are predicted to have a slight decrease in the average reservoir elevation (and volume) at Fordyce Lake of between zero and 18 feet. The maximum reservoir elevation difference would occur in Critically Dry years in September. Reservoir elevations (and volume) at Lake Spaulding would increase or decrease depending on the month and water year type. The maximum reduction would be approximately four feet in Critically Dry Years in September. Appendix D provides additional details of these reservoir elevation changes to the Proposed Upper Drum-Spaulding Project's two storage reservoirs. The other reservoirs were not considered in the analysis as they are not used as storage and would be operating similarly to the current operation. In Appendix D, modeling 33 years of hydraulic record and assuming 100 percent water allocation to downstream users, deficits occur in only two water years, 1977 and 1978 under existing conditions and would increase with the Proposed Projects as well as adding a small deficit in water year 1976. Deficits such as these would likely not be recovered using groundwater, instead, under similar hydrologic conditions, less total water would be delivered to the end users. Therefore, under similar hydrologic conditions as those modeled by PG&E, the Proposed Projects would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. As

a result, there would be a less than significant impact from implementation of the Proposed Projects and no mitigation would be required.

Mitigation Measures: None required.

c-i) 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: result in substantial erosion or siltation on- or off-site?

Less than significant.

The Proposed Projects would not alter the course of any streams or rivers, and existing drainage patterns would not be substantially altered by routine maintenance or operation of the Proposed Projects. Increased minimum flows are still well within the natural channel and less than the spill flows that are not part of the Proposed Projects often seen in the river reaches downstream of facilities. Increases in minimum instream flows may make small changes in where sediment is deposited within the stream reaches but the changes in flows from the current conditions are not large enough to significantly reroute any of the channels. Potential impacts from newly added impervious surfaces such as roads or parking lots related to recreation facilities is not evaluated in this CEQA analysis.

Therefore, the Proposed Projects would have a less than significant impact in terms of substantial erosion or siltation on or off site attributable to altered drainage patterns through the alteration of a river course or the addition of impervious surfaces, and no mitigation would be required.

Mitigation Measures: None required.

c-ii) 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: substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

Less than significant.

The Proposed Projects would not create any new impervious surfaces within the Proposed Upper-Drum Spaulding Project and Proposed Lower Drum Project areas. Additionally, the Proposed Projects would not significantly alter drainage patterns within both the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. For the same reasons that existing drainage patterns would not be significantly altered by the Proposed Projects, the Proposed Projects would have less than

significant impact on substantially increasing the rate or amount of surface runoff that would result in flooding on or off site attributable to altered drainage patterns through the alteration of a river course or the addition of impervious surfaces. Potential impacts from newly added impervious surfaces such as roads or parking lots related to recreation facilities is not evaluated in this CEQA analysis. As a result, no mitigation would be required.

Mitigation Measures: None required.

c-iii) 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: 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?

No impact.

Stormwater on the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project sites is not managed through constructed drainage systems, but rather infiltrates through the soil or discharges via surface flow to nearby rivers and streams. Additionally, as discussed above in item c-i, the Proposed Projects would not create any new impervious surfaces. Therefore, the Proposed Projects would not create substantial additional runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. As such, there is no impact and no mitigation would be required.

Mitigation Measures: None required.

c-iv) 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: impede or redirect flood flows?

No impact.

As discussed in item b, flood flows in the Proposed Project's waterways would not be altered by operation of the Proposed Projects as new minimum instream flows would still occur in the existing stream channels and would be less than the controlled spill events that are not associated with the Proposed Projects that often occur. Therefore, the Proposed Projects would have no impact on impeding or redirecting flood flows, and no mitigation would be required.



Mitigation Measures: None required.

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

Less than significant impact.

The Proposed Projects are not located near an ocean or body of water that would put the Proposed Projects in tsunami or seiche zones. Parts of the Proposed Projects, such as boat launches, picnic areas, or campsites, are in flood zones, and there is a risk of the release of pollutants, such as fuel or oil and grease from vehicles, at existing recreation facilities during a flood. However, as uses at the recreation facilities would not change from existing conditions, it is not anticipated that the risk of pollutant releases during operations of existing recreation facilities would increase from existing conditions. Therefore, impacts of the Proposed Projects would be less than significant and no mitigation is required.

Mitigation Measures: None required.

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

Potentially significant unless mitigation incorporated.

Operation of the Proposed Projects would be consistent with water quality control plans and groundwater management plans for Upper Drum-Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project through conditions on the Proposed Projects identified and required through the FERC relicensing process and conditions that will be required in the State Water Board's water quality certification, the purpose of which is to ensure that the Proposed Projects are operated in a manner that is protective of water quality.

The Proposed Projects would require implementation of water quality control measures through the *Erosion and Sediment Control Plan* (PG&E 2011) and MM-GEO-1, described above, during general operations of the Proposed Projects. As discussed in item b, groundwater would not be affected by the Proposed Projects. As discussed in item c-i, large amounts of impervious surface that could affect hydraulic flows would not be created. Therefore, with implementation of MM-GEO-1, the Proposed Projects' potential impact associated with the obstruction of a water quality control plan or sustainable groundwater management plan will be reduced to a less-than-significant level.

Mitigation Measures: No additional mitigation required.

3.10.3 References

- California Regional Water Quality Control Board Central Valley Region (CVRWQCB). 2018. Water Quality Control Plan for the Sacramento River Basin Sacramento and San Joaquin River Basins. Accessed December 8, 2020.
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf.
- Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020.
<http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.



3.11 Land Use and Planning

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 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"/>

3.11.1 Environmental Setting

The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas encompass the facilities and features included in the existing Upper Drum-Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project, as well as access roads and other lands necessary for recreation, shoreline management, and the protection of environmental resources.

Land uses in the vicinity of the Proposed Projects include general agriculture, residential agriculture, forest, residential forest, forest recreation, public, open space, recreation, resort, and timberland production zones.

3.11.1.1 Proposed Upper Drum-Spaulding Project

The Proposed Upper Drum-Spaulding Project is located in Nevada and Placer Counties, California. The Proposed Upper Drum-Spaulding Project area includes lands located on National Forest lands managed by the Forest Service. All other lands within the Proposed Upper Drum-Spaulding Project area are either owned by NID or privately owned by PG&E or private landowners. The revised Upper Drum-Spaulding Hydroelectric Project Boundary would encompass all facilities and features and include all lands necessary for PG&E to operate and maintain the Proposed Upper Drum-Spaulding Project.

The following plans and county ordinances direct land use and management in the vicinity of the Proposed Upper Drum-Spaulding Project area:

3.11.1.1.1 *Tahoe National Forest Land and Resource Management Plan*

The Tahoe National Forest encompasses approximately 800,000 acres within Sierra, Nevada, and Placer Counties, portions of which are located within the boundaries of the Upper Drum-Spaulding Hydroelectric Project. The Tahoe National Forest is managed by the Forest Service in accordance with the LRMP, as amended, for old forest ecosystems; aquatic, riparian, and meadow ecosystems; hardwood ecosystems; fire and fuels management; and noxious weed management. The LRMP establishes forest-specific management areas, each of which has standards and guidelines relating to the Forest Service's Recreation Opportunity Spectrum, VQOs, timber management practices, and off-highway vehicle use.

Forest-specific management areas in the vicinity of the Proposed Upper Drum-Spaulding Project include Henness, Meadow Lake, Grouse, South Yuba, Meadow, Twenty, Mears, Red, Loch Leven, Yuba Gap, Blue Castle, Chalk, Emigrant, Monumental, Fordyce, and Fuller.

Roads within the Tahoe National Forest are managed in accordance with the 2010 *Forest Service Motorized Travel Management EIS and Record of Decision*. The plan designates roads, trails, and other areas that are open to motor vehicle use on National Forest lands. The plan also prohibits the use of motor vehicles off designated roads, trails, and other areas, as well as motor vehicle use not consistent with the designations. Roads that are on Tahoe National Forest lands within the Proposed Upper Drum-Spaulding Project area are subject to the provisions of this plan.

Additionally, in accordance with Forest Service regulations, a special use authorization or permit is necessary to occupy, use, or build on National Forest land, whether the duration is temporary or long-term (Tahoe National Forest 1990).

3.11.1.1.2 *Nevada County General Plan and County Zoning Ordinance*

Nevada County manages private land uses in accordance with the 1996 *Nevada County General Plan*, as last amended in 2014. The plan is a long-term development planning guide for Nevada County. The Nevada County zoning ordinance identifies 31 land use categories, 7 of which are pertinent to the Proposed Upper-Drum Spaulding Project: general agriculture, residential agriculture, forest, timberland production zone, open space, public, and recreation (Nevada County 1996).

3.11.1.1.3 *Placer County General Plan and County Zoning Ordinance*

The 2013 *Placer County General Plan* guides the County's long-term land use and development. The plan addresses land use, circulation (transportation), housing, conservation, open space, noise, and safety. The Placer County zoning ordinance provides 22 land use categories, 6 of which are pertinent to the Proposed Upper Drum-Spaulding Project: agricultural exclusive, farm, forestry, open space, timber production, and water influence (Placer County 2013).

3.11.1.1.4 *Private Shoreline Management*

Privately owned land and/or residences exist along Kidd, Fuller, Rucker, Culbertson, and Rock Creek Lakes within the Proposed Upper Drum-Spaulding Project area. PG&E does not have formal, written shoreline management policies for uses and facilities on lands adjacent to reservoirs that are part of the Proposed Upper Drum-Spaulding Project. PG&E and privately owned lands along the reservoir shorelines are managed in accordance with the applicable county general plan and zoning ordinance. Federal- and state-owned lands along the reservoir shorelines are managed in accordance with the applicable federal or state land management plan. Shoreline development may be allowed when it is consistent with Proposed Upper Drum-Spaulding Project operational requirements, public safety, recreation plans, and other resource management plans, and when it is compliant with all federal, state, and local regulations.

3.11.1.1.5 *South Yuba River Comprehensive Management Plan*

The *South Yuba River Comprehensive Management Plan* (USDA Forest Service 2005) provides guidelines for public lands on a 29-mile stretch of the South Yuba River, beginning at Lake Spaulding. The plan deals with environmental, cultural, recreation, and other resources. Most of the Upper Drum-Spaulding Hydroelectric Project Boundary around Lake Spaulding falls into the management area; however, only a small section of Lake Spaulding, near the Spaulding No. 3 Powerhouse, is on public lands (i.e., Tahoe National Forest) and is subject to the plan's directives.

3.11.1.2 Proposed Lower Drum Project

The Proposed Lower Drum Project is located in Placer County, California. The Proposed Lower Drum Project area consists mainly of private land (671 acres, or 96 percent). The remaining land consists of state or county land (20.1 acres, or 3 percent) and land owned by the Bureau of Reclamation (5.3 acres, or 1 percent).

The plans and county ordinances that direct land use and management in the vicinity of the Proposed Lower Drum Project area include the *Placer County General Plan* and Zoning Ordinance and the *Bureau of Reclamation Sierra Resource Management Plan*.

3.11.1.2.1 *U.S. Bureau of Land Management Sierra Resource Management Plan*

The 2007 *U.S. Bureau of Reclamation Sierra Resource Management Plan* guides the protection of air quality and related public health, safety, and sensitive natural resources on Bureau of Reclamation lands (BLM 2007).

3.11.2 Impact Analysis

a) *Physically divide an established community?*

No impact.

Within the Proposed Upper Drum-Spaulding Project area, none of the proposed routine maintenance or ongoing operational activities would be located in established communities. Other activities that are part of the Proposed Upper Drum-Spaulding Project such as modified flow releases and the retirement of the Alta Powerhouse would not affect established communities.

Operations and maintenance that are part of the Proposed Lower Drum Project would generally be consistent with existing operations. PG&E would operate the Proposed Lower Drum Project in the same manner as it operates the Lower Drum Hydroelectric Project currently, with a few changes attributable to proposed environmental measures. Changes in future operations within the Proposed Lower Drum Project area would be related to new and increased minimum flow releases and modified ramping rates. None of the proposed modifications associated with the recreational facilities in the Proposed Lower Drum Project area relate to established communities. Therefore, the Proposed Projects would not physically divide any established communities. As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

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

No impact.

Within the Proposed Upper Drum-Spaulding Project area, the proposed routine maintenance and ongoing operations, along with the retirement of the Alta Powerhouse, would be consistent with local policies outlined in the *Nevada and Placer County General Plans*, along with the Tahoe National Forest LRMP.

Operations and maintenance of existing facilities within the Proposed Lower Drum Project area, with the addition of increased minimum flows, would be consistent with

local policies outlined in the *Placer County General Plan* (Placer County 2013) and the Bureau of Reclamation *Sierra Resource Management Plan* (BLM 2007).

Therefore, the Proposed Projects would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

3.11.3 References

- Nevada County. 1996. "Nevada County General Plan." Last updated 2014. Accessed February 27, 2020. <https://www.mynevadacounty.com/1065/General-Plan>.
- Placer County. 2013. "Placer County General Plan." Accessed February 27, 2020. <https://www.placer.ca.gov/2977/Placer-County-General-Plan>.
- Tahoe National Forest. 1990. "Tahoe National Forest Land and Resource Management Plan." Accessed February 27, 2020. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5214243.pdf.
- . 2010. "Motorized Travel Management, Final Environmental Impact Statement and Record of Decision." Accessed February 27, 2020. https://www.fs.usda.gov/nfs/11558/www/nepa/33963_FSPLT3_2628509.pdf
- U.S. Department of Agriculture, U.S. Forest Service (USDA Forest Service). 2005. *South Yuba River Comprehensive Management Plan – Final*.
- U.S. Department of the Interior Bureau of Land Management (BLM). 2007. "Sierra Resource Management Plan." Accessed February 19, 2020. [https://eplanning.blm.gov/epl-front-office/projects/lup/72554/96713/116819/Sierra ROD_12172007.pdf](https://eplanning.blm.gov/epl-front-office/projects/lup/72554/96713/116819/Sierra_ROD_12172007.pdf).

3.12 Mineral Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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"/>

3.12.1 Environmental Setting

Historically, one of the primary purposes of the Proposed Projects has been for diversion and delivery of water across sub-watersheds for uses other than hydropower generation—for example, municipal and domestic water supply, agriculture and irrigation, mineral extraction, and other industrial uses. Mineral resources within the Proposed Upper Drum-Spaulding Project and Lower Drum Project areas include gold, molybdenum, chromite, barite, and sand and gravel, with gold being the large majority (DOC 1990, 1995). Additionally, the North Fork of the American River, the Bear River, and the Yuba River are rich in gold deposits.

The state legislature adopted the Surface Mining and Reclamation Act in 1975, which designated Mineral Resource Zones (MRZs) for areas possessing minerals that are of statewide or regional significance. MRZs are areas classified by the presence or absence of significant sand, gravel, or stone deposits that are suitable as sources of aggregate, as described below (DOC 2019):

- MRZ-1: Areas where available geologic information indicates there is little likelihood for the presence of mineral resources.
- MRZ-2a: Areas that contain a significant measure of indicated reserves.

- MRZ-2b: Areas where geologic information indicates that significant inferred resources or demonstrated sub-economic resources are present.
- MRZ-3a: Areas likely to contain undiscovered mineral deposits similar to known deposits in the same producing district or region (hypothetical resources).
- MRZ-3b: Areas judged to have a favorable geologic environment for mineral resource occurrence, but where mineral discoveries have not been made in the region (speculative resources).
- MRZ-4: Areas where geologic information does not rule out either the presence or absence of mineral resources.

MRZs are identified in the DOC Division of Mines and Geology's *Mineral Land Classification Report* for Nevada and Placer Counties (DOC 1990, 1995). The reports from Nevada and Placer Counties designated the Proposed Upper Drum-Spaulding Project area, Proposed Lower Drum Project area, and area in vicinity of the Proposed Projects as MRZ-2a and MRZ-2b. The MRZ-2b designation represents an MRZ where adequate information indicates that several mineral deposits are present or that there is a high likelihood of their presence, so development should be controlled. In the Proposed Upper Drum-Spaulding Project area, MRZ-2a/2b zones are located near Fordyce Lake, west of Lake Putt, and northeast of Drum Forebay. In the Proposed Lower Drum Project area, MRZ-2b zones are located west of Colfax (copper and zinc) and near the south canal of Penstock TRL and Stone House Road (gold).

3.12.2 Impact Analysis

- 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?***
- 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?***

No impact.

The Proposed Projects would not result in any new operations or maintenance that would affect economically significant mineral resources or established mines. Additionally, the Proposed Projects would not result in changes to current land uses. Activities associated with the Proposed Projects may occur in the vicinity of an MRZ, but would not occur directly within an MRZ, as identified by the DOC Division of Mines and Geology's *Mineral Land Classification Report* for Nevada and Placer Counties (DOC 1990, 1995). Therefore, there would be no impacts on known and valuable mineral resources. Additionally, routine maintenance activities would not take place in areas

where there are active mines or locally important mineral resource recovery sites. Therefore, the Proposed Projects would not 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 and would not result in the loss of availability of a locally important mineral resource recovery site delineated on any local land use plans. As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

3.12.3 References

- California Department of Conservation (DOC), Division of Mines and Geology. 1990. *Mineral Land Classification of Nevada County, California*. Sacramento, California.
- . 1995. *Mineral Land Classification Placer County, California*. Sacramento, California.
- . 2019. *Guidelines for Classification and Designation of Mineral Lands*. State Mining and Geology Board – California Surface Mining and Reclamation Policies and Procedures. Sacramento, California.



3.13 Noise

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project result in:</i>				
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 applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 two 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 checked="" type="checkbox"/>	<input type="checkbox"/>

3.13.1 Environmental Setting

The Proposed Projects are located in a region containing both foothills communities and forested wilderness. Existing ambient noise levels in the area are relatively low. Existing sources of noise from the Proposed Projects include environmental factors (that is, wind and water), existing electrical and hydroelectric facilities, transportation sources, and recreational activities. Noise levels are noticeably higher closer to transportation and recreation sources. Sensitive receptors in the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas include recreationists

and residents. Distance, topography, and vegetation can help to reduce noise exposure.

3.13.2 Impact Analysis

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 applicable standards of other agencies?

Less than significant impact.

There would be no changes to the operation of the Proposed Projects that would be expected to alter the noise levels associated with the current hydropower facilities. Likewise, there would be no substantial change in ambient noise levels at recreation facilities during operations.

The Proposed Projects would generate temporary noise from routine maintenance activities and transport of maintenance equipment to recreation and hydropower facilities. For noise sources such as maintenance activity and vehicle traffic, the region of influence is typically less than 0.5 mile from the noise source. Noise coming from maintenance work, although temporary, can potentially affect nearby sensitive receptors, such as residences. Routine maintenance of the Proposed Projects would require using equipment that would be audible at off-site locations. Received noise levels would fluctuate depending on the maintenance activity, equipment type, and distance between noise source and receiver. Additionally, noise from equipment would vary depending on the number and type of equipment at a location at any given time.

Table 3-7 lists maximum noise levels recommended for noise impact assessments for typical equipment based on a distance of 50 feet between the equipment and a noise receptor. Equipment shown in Table 3-7 represents a broad overview of equipment and associated noise levels. Not all of the equipment listed in Table 3-7 would be used for maintenance of the Proposed Projects. For most maintenance activities associated with the Proposed Projects, equipment use would be limited to trucks and hand tools, but other equipment, such as graders and generators, may also be used at some locations and, therefore, are included in Table 3-7.

Table 3-7. Typical Maximum Construction Equipment Noise Levels (Lmax) for Analysis

Type of Equipment	Range of Maximum Sound Levels for Analysis (dBA at 50 feet)	Maximum Sound Levels for Analysis (dBA at 50 feet)
Rock drill	83–99	96
Jackhammer	75–85	82
Pneumatic tool	78–88	85
Pump	74–84	80
Haul truck	83–94	88
Portable generator	71–87	80
Tractor	77–82	80
Front-end loader	77–90	86
Hydraulic backhoe	81–90	86
Hydraulic excavator	81–90	86
Grader	79–89	86
Air compressor	76–89	86
Trucks	81–87	86

Source: Bolt et al. (1987)

Notes: dBA = A-weighted decibel, ft = foot, lb = pound

Sensitive receptors in the vicinity of the Proposed Upper Drum-SpaULDing Project could include residences, businesses, schools, churches, public libraries, or medical facilities. Sensitive receptors in the vicinity of the Proposed Lower Drum Project could include residences and businesses. No schools, churches, public libraries, or medical facilities are located in the vicinity of the Proposed Lower Drum Project. Maintenance and operations of the Proposed Projects would take place in remote areas and would not take place within 50 feet of any sensitive receptors. Recreational areas would see increases in noise during routine maintenance activities, but it would be temporary and limited to daylight hours.

Therefore, the Proposed Projects would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Proposed Projects in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. As such, the impact would be less than significant, and no mitigation is required.

Mitigation Measures: None required.

b) Generation of excessive groundborne vibration or groundborne noise levels?

No impact.

The region of interest for noise and vibration issues is typically localized. Groundborne vibrations generally attenuate rapidly with increasing distance from the vibration source. The distances involved depend primarily on the intensity of the vibrations generated by the source, and partly on soil and geologic conditions. Detectable vibrations will travel the greatest distance through solid rock and the least distance through loose, unconsolidated soils or saturated soils. For vibration sources such as maintenance activity and vehicle traffic, the region of influence is typically less than 1,000 feet from the vibration source.

Maintenance activities associated with the Proposed Projects would not generate excessive groundborne noise or vibration levels, nor would sensitive receptors be present in the Proposed Upper Drum-Spaulding Project and proposed Lower Drum Project areas. Given the remote nature of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, access roads would be small and equipment able to access those roads would also be small. As large, heavy equipment would not be used for routine maintenance activities, short-term impacts of groundborne noise or vibration generated would be less than significant.

As recreational facilities are existing and recreational vehicle traffic, as well as maintenance at the sites, are anticipated to generally be consistent with existing conditions, there would be no increase in groundborne noise or vibration impacts associated with operation of the Proposed Upper Drum-Spaulding Project.

Therefore, there would be no generation of excessive groundborne vibration or groundborne noise levels during operations and maintenance of the Proposed Projects. As a result, no impact would occur, and no mitigation is required.

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 two 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?

Less than significant impact.

There are two airports located near the Proposed Upper Drum-Spaulding Project area, including the Jackson Lake heliport, located 3.2 miles from the Proposed Upper Drum-

Spaulding Project area, and the Aeroportul Blue Canyon – Nyack, located within 2 miles from the Proposed Upper Drum-Spaulding Project area. There are two airports located within two miles of the Proposed Lower Drum Project area, including the Cal Fire Auburn Helipad and the Auburn Municipal Airport.

The Proposed Projects do not include any new residential uses. Recreation sites and hydropower facilities associated with the Proposed Projects currently exist, so the Proposed Projects would not expose recreationists or workers to new sources of noise. Therefore, the Proposed Projects would not expose people residing or working in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas to excessive noise levels resulting from aircraft noise. As a result, impacts would be less than significant, and no mitigation is required.

Mitigation Measures: None required.

3.13.3 References

Bolt, Richard, Leo Beranek, and Robert Newman. 1987. *Noise Control for Buildings and Manufacturing Plants*.

3.14 Population and Housing

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
a) Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., 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"/>

3.14.1 Environmental Setting

3.14.1.1 Proposed Upper Drum-Spaulding Project

The Proposed Upper Drum-Spaulding Project is located in Nevada and Placer Counties, California, and would use existing facilities on the South Yuba River, Bear River, and North Fork of the American River, in PG&E's Upper Drum-Spaulding Hydroelectric Project, FERC Project No. 2310.

The Upper Drum-Spaulding Hydroelectric Project Boundary includes National Forest lands managed by Forest Service as part of the Tahoe National Forest (949.3 acres, 23 percent). All other lands within the Upper Drum-Spaulding Hydroelectric Project Boundary are in private ownership, either by PG&E (3,064 acres, 73 percent) or private landowners (199.4 acres, 4 percent).

The Proposed Upper Drum-Spaulding Project area is remote and sparsely populated. Due to environmental conditions (e.g., topography, inaccessibility, etc.), zoning, and land ownership constraints associated with the Proposed Upper Drum-Spaulding Project area, there are very few communities and residences. The nearest and largest community to the Proposed Upper Drum-Spaulding Project area is Alta, a census-



designated place located approximately one mile south of Alta Reservoir. The population of Alta, according to the 2010 census, is 610 (US Census 2010). The second largest and closest community to the Project is Dutch Flat, another census-designated place located approximately three miles south of Alta Reservoir. The population of the Dutch Flat community, according to the 2010 census, is 160 (US Census 2010).

3.14.1.2 Proposed Lower Drum Project

The Proposed Lower Drum Project is located in Placer County, California, and would use existing facilities on the Bear River, Dry Creek, Rock Creek, and Auburn Ravine that are part of PG&E's Lower Drum Hydroelectric Project.

The Lower Drum Hydroelectric Project Boundary encompasses mainly private land (671 acres, or 96 percent). The remaining land within the Lower Drum Hydroelectric Project Boundary consists of state or county land (20.1 acres, or 3 percent) and land owned by the Bureau of Reclamation (5.3 acres, or 1 percent).

The Proposed Lower Drum Project area is generally rural and not densely populated. The city of Auburn is the largest and closest city to the Proposed Lower Drum Project area and is located approximately three miles south of Rock Creek Lake and approximately one mile southeast of Wise Forebay. According to the 2010 census, the population of Auburn is 13,330. Meadow Vista, classified as a census-designated place, is the second largest community in the Proposed Lower Drum Project area. It is located approximately 1.75 miles northeast of Halsey Forebay. According to the 2010 census, the population of the community of Meadow Vista is 3,217. Newcastle, also a census-designated community, is the third-largest community in the Proposed Lower Drum Project area and is located approximately three miles northwest of Folsom Lake. The population of Newcastle, according to the 2010 census, is 1,224.

3.14.2 Impact Analysis

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

No impact.

The Proposed Projects would not encourage population growth in or near the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, as no new residential facilities are proposed or reasonably foreseeable as a result of the Proposed Projects. The Proposed Projects would not convert any non-residential lands to residential lands. The Proposed Projects would continue the operation and

maintenance of the existing hydropower facilities. No new roads, water supply, or changes to land uses are proposed that would contribute to population growth. Therefore, the Proposed Projects would not induce substantial unplanned population growth in the area either directly or indirectly. As a result, no impact would occur, and no mitigation is required.

Mitigation: None required.

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

No impact.

The Proposed Projects would not displace any people or housing as the majority of the Proposed Projects occurs on uninhabited lands owned by PG&E and on National Forest lands managed by Forest Service as part of the Tahoe National Forest. Therefore, the Proposed Projects would not require the construction of replacement housing. As a result, no impact would occur, and no mitigation is required.

Mitigation: None required.

3.14.3 References

U.S. Census Bureau (US Census). 2010. Explore Census Data. Accessed on November 25, 3030. [https://data.census.gov/cedsci/?q=alta california population](https://data.census.gov/cedsci/?q=alta+california+population).



3.15 Public Services

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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:				
i. Fire Protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii. Police Protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv. Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
v. Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.15.1 Environmental Setting

3.15.1.1 Proposed Upper Drum-Spaulding Project

The Forest Service provides law enforcement services related to natural and cultural resource protection, as well as fire suppression and prevention activities on Tahoe National Forest lands within the Proposed Upper Drum-Spaulding Project area. The Tahoe National Forest and Cal Fire are responsible for wildlife fire protection and suppression on lands in the Proposed Upper Drum-Spaulding Project area and, therefore, the area is under their respective jurisdictions. The Nevada County Sheriff's Department provides police protection in Nevada County. The California Highway

Patrol also provides law enforcement on unincorporated public roads in the Proposed Upper Drum-Spaulding Project area. Emergency procedures and protocols exist under PG&E's current license and will continue under the *Fire Prevention and Response Plan on Federal Lands* (PG&E 2011). These emergency procedures generally include fire prevention and protection actions, practice of fire safety at recreation facilities, procedures in the reporting of wildland fires, and implementation of protocols for fire control and extinguishing fires.

3.15.1.2 Proposed Lower Drum Project

Emergency procedures and protocols exist under PG&E's current license, primarily under the *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) and would remain in place under the Proposed Lower Drum Project. These emergency procedures include existing fire prevention and protection actions, practicing fire safety at recreation facilities, following procedures in the reporting of wildland fires, and implementing protocols for fire control and extinguishing fires. Fire protection and emergency services within the Proposed Lower Drum Project area are a shared responsibility of Cal Fire and local municipalities. PG&E provides the Sheriff with an authorization letter, which is effective for a six-month period and resubmitted semi-annually. The California Highway Patrol also provides law enforcement on unincorporated public roads in the Proposed Lower Drum Project area.

The Proposed Lower Drum Project area includes one public park, the Meadow Vista Park. PG&E's facility in the park consists of an emergency spillway that runs within a right-of-way through an established riparian area on the eastern portion of the park. Other than the spillway at Meadow Vista Park and the existing recreation facilities for public use, no other public facilities exist within the Proposed Lower Drum Project area.

3.15.2 Impact Analysis

a-i) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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.

No impact.

The Proposed Projects would not increase the number of recreational users or workers in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Therefore, the demand for fire protection services would not increase.



In addition, the *Fire Prevention and Response Plan on Federal Lands* (PG&E 2011), as described in Section 3.20, *Wildfire*, provides (1) fire prevention procedures, (2) reporting procedures, and (3) safe fire practices. The *Fire Prevention and Response Plan on Federal Lands* (PG&E 2011) identifies areas of high fire risk that would require more frequent monitoring, but this monitoring would be carried out by PG&E and not by local fire protection services.

Therefore, the Proposed Projects would not necessitate substantial additional fire protection services that would require additional fire personnel or the construction of new or significantly altered fire protection facilities. Furthermore, fire response times would remain consistent with current response times, as the proposed new recreation facilities are all located at existing recreational areas. Primary Project Roads and recreation roads will be maintained in the conditions described in the *Transportation Management Plan* which was developed in coordination with resource agencies. Other roads that may be used to access the Proposed Projects would be maintained by the responsible party (i.e., Forest Service, county, etc.). As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

a-ii) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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: Police Protection

No impact.

The Proposed Projects include several recreation areas within the Upper Drum-Spaulding Hydroelectric Project Boundary and Lower Drum Hydroelectric Project Boundary, all of which use existing roads for access. PG&E cooperates with Nevada County and the Forest Service to allow its law enforcement agents to access and provide enforcement on PG&E property within the Proposed Upper Drum-Spaulding Project area. PG&E also cooperates with Placer County to give County law enforcement agents access to provide enforcement on PG&E property within the Proposed Lower Drum Project area.

The Proposed Projects would not increase the number of recreational users or works in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Therefore, the demand for police services would not increase.

Furthermore, police response times would remain consistent with current response times. Primary Project Roads and recreation roads will be maintained in the conditions described in the *Transportation Management Plan* which was developed in coordination with resource agencies. Other roads that may be used to access the Proposed Projects would be maintained by the responsible party (i.e., Forest Service, the county, etc.). Therefore, the Proposed Projects would not necessitate substantial additional police services in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas that would require additional police personnel or the construction of additional police facilities. As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

a-iii) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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: Schools

No impact.

No schools exist within the Upper Drum-Spaulding Hydroelectric Project Boundary and Lower Drum Hydroelectric Project Boundary. The Proposed Projects would not generate an increase in population that would affect schools. Therefore, no impact on or associated with schools would occur, and no mitigation is required.

Mitigation Measures: None required.

a-iv) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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: Parks

No impact.

Besides existing recreation areas, no parks exist within the Upper Drum-Spaulding Hydroelectric Project Boundary. One park is located within the Lower Drum Hydroelectric Project Boundary: Meadow Vista Park. However, the Proposed Lower Drum Project would not alter this park. The Proposed Projects would not generate an

increase in population that would affect parks. Therefore, no impact on or associated with parks would occur, and no mitigation is required.

Mitigation Measures: None required.

a-v) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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: Other public facilities

No impact.

The Proposed Projects would not generate an increase in population that would affect any other public facilities. Therefore, no impact on or associated with public facilities would occur, and no mitigation is required.

Mitigation Measures: None required.

3.15.3 References

Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020.
<http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.

3.16 Recreation

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
a) Would the project 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 type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.16.1 Environmental Setting

The Proposed Projects would involve routine maintenance and ongoing operations of recreation facilities in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. The new licenses for the Proposed Projects also include provisions for future upgrades and construction work at recreation facilities.

Construction site plans for facility upgrades and new construction have not yet been finalized, and those activities are not part of this analysis; those projects will require discretionary approvals and environmental analysis prior to any construction activities. See Section 2, *Proposed Projects*, for the locations of proposed recreational facilities construction.



3.16.2 Impact Analysis

a) Would the project 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?

No impact.

The Proposed Projects would involve routine maintenance and ongoing operations of recreational facilities, however future new construction projects at recreational facilities are not part of the Proposed Projects. Operations and maintenance of the Proposed Projects' recreation facilities would not substantially accelerate physical deterioration of PG&E's recreational facilities nor increase the number of recreationalists using the facilities. No neighborhood or regional parks would be affected by the Proposed Projects. Overall, the Proposed Projects would have no impact and would not accelerate physical deterioration of existing facilities. As a result, no mitigation would be required.

Mitigation Measures: None required.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

Potentially significant unless mitigation incorporated.

The Proposed Projects include routine maintenance and ongoing operations of recreational facilities. Maintenance of recreational facilities has the potential to affect biological resources and geology and soil resources in the Proposed Upper Drum-Spaulling Project and Proposed Lower Drum Project areas. Analysis of these impacts and required mitigation measures are discussed in Section 3.4, *Biological Resources*, and in Section 3.7, *Geology and Soils*.

As part of the new licenses for the Proposed Projects, the *Recreation Management Plan* requires that a Site Development and Construction Plan be developed for each future major recreation improvement project. Future recreation improvement projects would be subject to additional permits and approvals, however, the *Recreation Management Plan* and Site Development and Construction Plans would further reduce potential impacts to the physical environment. The Site Development and Construction Plan for future recreation improvement projects would include:

- a) Description of the proposed improvements, construction methods, equipment, crews, access routes, and timing;

- b) Description of measures to avoid impacts to water quality and sensitive resources;
- c) Identification of permitting and other regulatory requirements needed prior to construction;
- d) Identification of appropriate site-specific erosion and sedimentation control measures; and
- e) Identification of necessary measures to provide appropriate recreation traffic and parking during the construction (PG&E 2011).

Other recreation maintenance projects involving minor ground disturbance or no ground disturbance would only minimally modify conditions at the recreation sites and would not require a Site Development and Construction Plan by the *Recreation Management Plan*.

Therefore, after biological resources and geology and soils mitigation measures have been implemented, along with the *Recreation Management Plan*, impacts from the Proposed Projects on the physical environment would be less than significant.

Mitigation Measures: see mitigation for Biological Resources (Section 3.4) and for Geology and Soils (Section 3.7).



3.17 Transportation

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with 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 type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.17.1 Environmental Setting

The Proposed Upper Drum-Spaulding Project is located in remote areas of Placer and Nevada Counties. The Proposed Lower Drum Project is located in remote areas of Placer County. Sites within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are accessed using small, remote roadways off Interstate 80. The majority of these remote roadways are paved and unpaved, two-lane roads that lack bicycle or pedestrian facilities. No new roads would be built as part of the Proposed Projects. The Proposed Projects include recreational sites that would be accessed by recreationists on public roads. Roads that are part of the Proposed Projects would be maintained by PG&E for the life of the licenses.

3.17.2 Impact Analysis

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

Less than significant impact.

Existing roadways in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are mostly rural roadways with no bicycle or pedestrian facilities.

There would be a temporary increase in use of the rural roadways during short-term routine maintenance activities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. However, maintenance activities would be spaced out over time and the number of workers and vehicles present at a given time is kept to a minimum (PG&E 2011).

Long-term operations within the Proposed Lower Drum Project area would not result in an increase in the number of vehicles using the rural roadways. This is because operations and maintenance activities within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project area are not anticipated to increase the public service capacity of these facilities.

Therefore, the Proposed Projects would not conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. As such, the impact would be less than significant, and no mitigation is required.

Mitigation Measures: None required.

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

Less than significant impact.

Section 15064.3 of the CEQA Guidelines states the following:

(b) Criteria for Analyzing Transportation Impacts.

(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

(3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

Operation of the Proposed Projects would not cause a long-term increase in the amount of vehicle miles traveled.

Implementation of the Proposed Projects would cause a minor, short-term increase in the amount of vehicle miles traveled attributable to routine maintenance activities. The increase in vehicle miles would be small, considering the types of maintenance activities (small number of pieces of vehicles or construction operators, minimal number of structures needing materials transported to the site, etc.). Maintenance activities would be spaced out over time so that the number of activities happening at a given time is kept to a (PG&E 2011). Given the remote nature of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project locations, only a small number of workers and vehicles would be present during maintenance and operations.

Therefore, the Proposed Projects would not conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), which sets the criteria for assessing transportation impacts. As such, the Proposed Projects would have a less than significant impact and no mitigation is required.

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)?

No impact.

The Proposed Projects would not change the surrounding transportation system's geometric design features or require new incompatible uses. The temporary maintenance work associated with the Proposed Projects would be accessed using existing rural roadways. Therefore, the Proposed Projects would not substantially increase public hazards due to a change in a geometric design feature or incompatible uses. As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

d) Result in inadequate emergency access?

No impact.

Long-term operations and temporary construction of the Proposed Projects would not change access routes to or within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas or result in inadequate emergency access (See Section 3.20, *Wildfire* for more information on the *Transportation System Management Plan* and emergency access). As a result, no impact would occur and no mitigation is required.

Mitigation Measures: None required.

3.17.3 References

Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020.
<http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.



3.18 Tribal Cultural Resources

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>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:</i>				
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 checked="" type="checkbox"/>	<input 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.18.1 Environmental Setting

This section focuses on the potential for impacts on historical and tribal cultural resources attributable to the Proposed Projects. For the purposes of this section:

Tribal Cultural Resources: Tribal cultural resources (TCRs) are defined consistent with the Public Resources Code Section 21074(1)(a), which includes sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native

American tribe that are either included or determined to be eligible for inclusion in the California Register of Historical Resources, or included in a local register of historical resources, or as determined by the lead agency under the criteria for listing [Public Resources Code 21074(1)(a)].

Historical Resources: Historical resources are defined consistent with Public Resources Code Section 21084.1, which includes a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources, or as determined by the lead agency (Public Resources Code 21084.1).

On October 9, 2020, the State Water Board initiated the consultation process by notifying the United Auburn Indian Community of the opportunity for consultation regarding TCRs related to the Proposed Projects by sending a letter to Honorable Chairman Gene Whitehouse. On November 20, 2020, the United Auburn Indian Community responded with a request for consultation. On December 2, 2020, the United Auburn Indian Community and the State Water Board began tribal consultation. Consultation is ongoing.

Cultural history is often of great interest to the public. However, locational and other information about traditional cultural properties (TCPs), TCRs, or any historical resources can result in irreparable vandalism or other damages to these resources. As a result, various state and federal regulations have been passed that allow for restrictions on confidential site location information and other information that could result in damage to these resources such as CEQA, Section 9 of ARPA (for federal lands), and Section 304 of the National Historic Preservation Act of 1966 (16 USC 4702-3).

PG&E conducted a Native American TCP study in 2006 to 2011 as part of the FERC relicensing for the Upper Drum-Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project. The study included contacting the Native American Heritage Commission (NAHC) for lists of potentially interested tribes and individuals and important tribal resources that may be documented in the NAHC's Sacred Lands files; background, archival, and literature research; field visits; oral interviews with tribal informants; and NRHP evaluation and reporting. The TCP study included the participation of the United Auburn Indian Community, Colfax-Todds Valley Consolidated Tribe, Todds Valley Miwok-Maidu Cultural Foundation, Nisenan Maidu, Washoe Tribe of Nevada and California, Tsi-Akim Maidu, Shingle Springs Band of Miwok Indians, and Greenville Rancheria of Maidu Indians. The results of the study are provided in a TCP report (Davis-King 2011). The TCP report includes confidential information provided by the tribal informants and was filed with FERC as privileged. Thus, the report is provided only on a need-to-know basis. A public summary that describes the methods and



results of the TCP study, but that omits the privileged information, is provided in the Final License Application in Section 6.8 of Exhibit E.

PG&E developed an HPMP (PG&E 2011) to guide the management of cultural resources and to address potential impacts to cultural and tribal resources during the term of the new Upper Drum-Spaulding Hydroelectric Project and Lower Drum Hydroelectric Project licenses that includes avoidance, protection, monitoring, and mitigation measures. The HPMP (PG&E 2011) was developed in consultation with Native American tribes, Tahoe National Forest, BLM, and the SHPO.

The historical and tribal cultural resources impact analysis is based on a review of existing information, such as the results of the California Historical Resources Information System confidential record searches, and the consultation process with the United Auburn Indian Community.

Sites that may potentially be considered a TCR within the Proposed Projects include places of traditional practices, archaeological sites such as, but not limited to, bedrock milling stations, lithic scatters, and occupation sites; rock art sites; cultural landscapes or historic districts; and historic period communities. Although no cemeteries or individual burials have been encountered in the boundaries of the Proposed Projects, it is always possible that human remains/cemeteries might be encountered during the term of the new licenses.

3.18.2 Impact Analysis

- a) 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 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)?***

Potentially significant unless mitigation incorporated.

The Proposed Projects involve the continued operations of existing structures and would be generally consistent with existing operations. PG&E would maintain the Proposed Projects' facilities in the same manner as under the current license.

As stated in Chapter 2 (Proposed Projects), the Jordan Creek Diversion Dam in the Upper Drum-Spaulding Hydroelectric Project is proposed to be decommissioned. Additionally, PG&E also proposes to construct new, or expand existing, recreation

facilities. As stated in Chapter 2 (Proposed Projects), at the time of this CEQA analysis these activities are not well-defined and additional CEQA analysis will be required for the recreational facility modification and Jordan Creek Diversion Dam removal prior to implementation of those actions.

TCRs may be present within the Proposed Projects' boundaries. TCRs may include places of traditional practices; archaeological sites such as, but not limited to, bedrock milling stations, lithic scatters, and occupation sites; rock art sites; cultural landscapes or historic districts; and historic period communities. Although no cemeteries or individual burials have been encountered in the Proposed Projects' boundaries, it is always possible that human remains/cemeteries might be encountered during the term of the new licenses.

Because the Proposed Projects do not routinely involve ground-disturbing activities outside of ongoing maintenance activities such as routine maintenance of the facilities, vegetation management, and road maintenance, which are consistent with existing conditions, no impacts are expected for TCRs.

Therefore, as TCR identification is ongoing, and the potential exists for unidentified TCRs to be encountered, identified, and affected during regular ongoing maintenance, implementation of MM-TCR-1 *Implementation of the Historic Properties Management Plan* is required to reduce the potential impact to less than significant with mitigation.

Mitigation Measures:

MM-TCR-1 – Implementation of the Historic Properties Management Plan. In accordance with the provisions provided with Section 5.8 and 5.9 of the HPMP, consultation will occur with Native American tribes on an activity-by-activity basis to ensure no adverse impacts will occur. If a resource is determined to be a TCR as defined by the Public Resources Code, Section 20174, during consultation under Sections 5.8 and 5.9 of the HPMP, appropriate site-specific mitigations will be developed consistent with Public Resources Code Section 21084.3, and impacts will be reduced to a less than significant level pursuant to Section 5.10 of the HPMP.

b) 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 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Potentially significant unless mitigation incorporated.

As stated in item a), above, identification of TCRs is ongoing in consultation according to HPMP requirements with California Native American tribes traditionally and culturally affiliated with a geographic area for which they may have expertise concerning TCRs in each of the FERC Project boundaries. Because the Proposed Projects do not routinely involve ground-disturbing activities outside of ongoing maintenance activities such as routine maintenance of the facilities, vegetation management, and road maintenance, which are consistent with existing conditions, no impacts are expected for TCRs.

However, as TCR identification is ongoing, and the potential exists for unidentified TCRs to be encountered, identified, and affected during regular ongoing maintenance, implementation of MM-TCR-1: *Implementation of the Historic Properties Management Plan* is required to reduce the potential impact to less than significant with mitigation.

Mitigation Measures:

MM-TCR-1: Implementation of the Historic Properties Management Plan.

3.18.3 References

Davis-King, Shelly. 2011. *Bear Drums in the Central Sierra: American Indian Traditional Cultural Properties Report*. Davis-King & Associates, Standard, California. Prepared for Pacific Gas and Electric Company's Drum-Spaulding Hydroelectric Project (FERC Project No. 2310) and Rollins Transmission Line Project (FERC Project No. 2784), and Nevada Irrigation District's Yuba-Bear Hydroelectric Project (FERC Project No. 2266). Submitted to HDR Engineering, Inc., Sacramento.

Pacific Gas and Electric Company (PG&E). 2011. Application for New License, Drum-Spaulding Project FERC Project No. 2310-173. Accessed February 28, 2020. <http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.

3.19 Utilities and Service Systems

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications 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 type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a determination by the wastewater treatment provider, which 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 type="checkbox"/>	<input checked="" type="checkbox"/>
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"/>



Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.19.1 Environmental Setting

The Proposed Upper Drum-Spaulding Project is located in remote forested areas of Nevada and Placer Counties. The Proposed Lower Drum Project is located in remote forested areas of Placer County. Facilities and operations of the Proposed Projects primarily use sources of water, power, and waste disposal that are not part of a larger utility.

3.19.2 Impact Analysis

a) *Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?*

Less than significant impact.

The Proposed Projects would not have any impacts on existing utilities. No new buildings or housing would be constructed that would cause a change in occupancy. The Proposed Projects would not require the relocation or construction of any new or existing water supply, wastewater treatment or stormwater, electric power, natural gas, or telecommunication facilities.

According to the *Hydraulic Modeling Assessment* for the Proposed Projects (Appendix D), overall, there would be relatively little change to water supply reliability except in the driest of years, when water supply would already be affected.

The anticipated changes in instream flows and other environmental measures related to water supply (i.e., water year types and ramping rates) under the Proposed Projects would reduce energy generation from existing PG&E hydroelectric facilities (see Section 3.6, *Energy* for more information). FERC's (2014) FEIS estimated these changes would

result in a loss of 61,400 MWh for the Proposed Upper Drum-Spaulding Project and 13,300 MWh for the Proposed Lower Drum Project, a total of 74,700 MWh. PG&E estimates their 110 hydropower generating units produce an average of 11,672,000 MWh annually (PG&E 2010), so the loss of power generation for the Proposed Projects to PG&E's overall portfolio is less than one percent. From a broader perspective, the California Energy Commission (2019) estimates 34,476,300 MWh of power are produced annually from hydropower in California so the loss of power production from the Proposed Projects is less than one quarter of one percent. As this is such a small portion of PG&E and California's total energy generation, it is not anticipated to negatively affect end users, nor would this change require that new energy generation facilities be constructed at other locations.

As the changes to water availability would only occur in the driest of years (and deficits occur under the existing conditions already) and power generation loss is such a small percentage of PG&E and California's overall portfolio, implementation of the Proposed Projects would have a less than significant impact because it would not cause the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, and no mitigation is required.

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?

No impact.

The Proposed Projects would not use any municipal water sources. Water used in maintenance or operations would continue to come from rivers or wells in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, and no modifications to PG&E's water rights would be needed for the Proposed Projects under the proposed new license.

New operations would not alter the current water supply at facilities in the Proposed Projects from existing conditions, including in normal, dry, or multiple dry years, as shown in the *Hydraulic Modeling Assessment* (Appendix D).

Therefore, sufficient water supplies would be available to serve the Proposed Projects and any reasonably foreseeable future growth. As a result, no impact would occur, and no mitigation is required.

Mitigation Measures: None required.

- c) Result in a determination by the wastewater treatment provider, which 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?***

No impact.

The Proposed Projects would not contribute wastewater to any external treatment providers. Sanitary waste disposal needs for facilities associated with the Proposed Projects would continue to be served by vault toilets, which would be periodically pumped, with the sewage transported to an appropriate facility with adequate capacity for disposal. Therefore, the Proposed Projects would have no impact on a wastewater treatment facility's capacity to serve the Proposed Projects or existing commitments, and no mitigation is required.

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?***

Less than significant impact.

The Proposed Projects would not generate solid waste in excess of local/state standards or infrastructure capacity (see Section 3.9, *Hazards and Hazardous Waste for more information*). Waste generated by the Proposed Projects during most maintenance activities would include minimal amounts of waste and excess materials. Therefore, the Proposed Projects would have a less than significant impact on the generation of solid waste in excess of state or local standards or infrastructure capacity, and no mitigation is required.

Mitigation Measures: None required.

- e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?***

No impact.

During routine maintenance activities, usable excess 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 appropriate local waste transfer stations. All activities associated with the Proposed Projects must comply with applicable solid waste disposal laws and policies. Any hazardous waste generated by activities associated with the Proposed Projects must be properly handled, transported, and

disposed of at a facility that can accept the waste. Therefore, the Proposed Projects would have no impact on compliance with solid waste regulations, and no mitigation is required.

Mitigation Measures: None required.

3.19.3 References

Pacific Gas and Electric (PG&E). 2020. "Learn About Our Hydroelectric System." Accessed January 21, 2020. https://www.pge.com/en_US/safety/how-the-system-works/hydroelectric-system/hydroelectric-system.page.



3.20 Wildfire

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:</i>				
a) 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) 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) Require the installation or maintenance 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"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.20.1 Environmental Setting

The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are located in State Responsibility Areas with Fire Hazard Severity Zones ranging from

moderate to very high and in Federal Responsibility Areas (Cal Fire 2007). Wildfire protection services for the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas are provided by Cal Fire, the Forest Service, Nevada County, and/or Placer County. Caretakers and maintenance workers for the Proposed Projects, as well as additional users of the Proposed Projects' recreational facilities, would not permanently occupy the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. However, they are considered occupants for the purpose of this analysis.

PG&E's *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) provides information necessary for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Projects during construction and for long-term operation and maintenance activities. The *Fire Prevention and Response Plan on Federal Land* identifies 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 Projects and Forest Service resources over the term of the license. Other aspects of fuels management primarily related to vegetation treatments, including powerline clearance, are contained in the IVMP (PG&E 2011). PG&E's *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) will be updated in consultation with the Forest Service, Cal Fire, Nevada County, Placer County, and others, as appropriate.

3.20.2 Impact Analysis

a) *Substantially impair an adopted emergency response plan or emergency evacuation plan?*

Less than significant impact.

Nevada County's *2019 Wildfire Preparedness Action Plan* describes how the county will respond to wildfires. Under the plan, the Nevada County Office of Emergency Services leads strategic and tactical planning to address local wildfire hazard reduction and preparedness (Nevada County 2019). Placer County has a *Community Wildfire Protection Plan* that describes how the county will respond to wildfires. The plan is a community-wide planning effort and offers solutions and mitigation recommendations for homeowners and land managers for short- and long-term wildfire protection planning efforts in the Placer County area (Placer County 2012).

On a temporary basis, routine maintenance associated with the Proposed Projects could result in temporary and minor impacts to local traffic during the work period. However, this potential impact would not impair an emergency operations plan as the

Proposed Projects would include implementation of the *Transportation System Management Plan* (PG&E 2011), 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 *Transportation System Management Plan* (PG&E 2011) for the Proposed Projects, PG&E would maintain emergency access routes during maintenance activities and ensure emergency vehicles can travel through or around work areas when needed. Therefore, during construction, the Proposed Projects would not interfere with emergency evacuation plans.

On a long-term basis, operations and maintenance of the Proposed Projects would not increase traffic in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas to the extent emergency response times would be impaired, and the Proposed Projects would not involve inundation of routes or construction of any other facilities that could affect existing evacuation and emergency service routes. See PG&E's *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) for more information on traffic configurations. Therefore, during long-term operations, the Proposed Projects would not interfere with emergency response or evacuation plans.

In summary, with application of the Proposed Projects' *Transportation System Management Plan* (PG&E 2011) and PG&E's *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) during routine maintenance and ongoing operations, the Proposed Projects would not substantially impair an adopted emergency response plan or emergency evacuation plan. As a result, impacts from the Proposed Projects would be less than significant and no mitigation is required.

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?

Less than significant impact.

The Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas contain vast areas of steep-sloped forests that are subject to periodic wildfire. Further, implementation of the Proposed Projects would involve the use of motorized vehicles and equipment for operations and maintenance, and it has been documented that equipment use is one of the top causes of fire in California (Cal Fire 2019). Therefore, the Proposed Projects would have the potential to exacerbate fire risk and could expose recreationists and workers to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.

However, the Proposed Projects would not exacerbate wildfire risks compared to existing conditions because the Proposed Projects include implementation of PG&E's *Fire Prevention and Response Plan on Federal Land* (PG&E 2011), which describes tools and specifies actions for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Projects. In addition, activities associated with the Proposed Projects would not exacerbate the physical conditions at these locations such that the risk of wildfires increases, and some routine maintenance activities, such as vegetation management, at existing facilities may reduce these risks. Finally, as discussed in item a, PG&E's *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) would be implemented during long-term operation and maintenance; this plan would further reduce the potential of the Proposed Projects exacerbating the risk for wildfire during routine maintenance and operation. Therefore, impacts from the Proposed Projects related to exacerbation of wildfire risks or the exposure of occupants to increased pollutant concentrations of uncontrolled wildfire would be less than significant and no mitigation would be required.

Mitigation Measures: None required.

c) Require the installation or maintenance 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?

Less than significant impact.

The Proposed Projects could result in impacts related to the maintenance of infrastructure. Routine maintenance at facilities associated with the Proposed Projects is already occurring, it is not anticipated that there would be an increased risk of wildfire attributable to ongoing operation and maintenance.

The impact of the Proposed Projects would 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 facilities. As noted above, PG&E would also implement the *Fire Prevention and Response Plan on Federal Land* (PG&E 2011), which includes signs for educating the public about fire danger and safety and restrictions on burning during times of very high and extreme fire danger.

Given the geography and surrounding forest conditions, the risk of wildfire would continue to be very high in some locations, but implementation of PG&E's *Fire Prevention and Response Plan on Federal Land* (PG&E 2011) to protect proposed and existing facilities and people in the Proposed Upper Drum-Spaulding Project and



Proposed Lower Drum Project areas would reduce the risk from current conditions. Ongoing evaluation of fire danger in the area and burning bans implemented by the Forest Service on Forest Service land during very high and extreme fire danger would further aid in reducing fire risk.

Therefore, although implementation of the Proposed Projects would require the maintenance of infrastructure that could exacerbate fire risk or that may result in temporary or ongoing impacts to the environment, the impact would be less than significant and no mitigation is required.

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?

Less than significant impact.

The Proposed Projects would not include any maintenance activities that would alter drainage patterns or slopes in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Therefore, the Proposed Projects would not result in the creation of new flooding or landslide risks. Further, the Proposed Projects would not create new structures or induce growth in the number of recreational users or workers in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, and therefore would not create any new risk to people or structures from flooding or landslides that may result from post fire slope instability or drainage changes.

Exposure of people or structures to significant risks associated with post-fire slope instability or minor drainage changes would be minimized through implementation of the *Fire Prevention and Response Plan on Federal Land* (PG&E 2011). The plan specifically addresses post-fire activities such as post-fire slope instability, runoff, or drainage changes. Currently, no post-fire slope instability exists in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. As a result of existing geography, potential future post-fire slope instabilities could affect sites in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas; however, areas downslope of areas of post-fire slope instability would be closed if a hazard is identified (PG&E 2011). Additional discussion of potential impacts related to soil stability and landslides is found in Section 3.7, *Geology and Soils*. Additional discussion of potential impacts on hydrology, including alteration to drainage, runoff, and flooding patterns, is found in Section 3.10, *Hydrology and Water Quality*.

Therefore, the Proposed Projects would not 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. As a result, impacts would be less than significant and no mitigation is required.

Mitigation Measures: None required.

3.20.3 References

- California Department of Forestry and Fire Protection (Cal Fire). 2007. "Fire Hazard Severity Zones Maps." Accessed February 27, 2020.
<https://osfm.fire.ca.gov/divisions/wildfire-prevention-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/>.
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https://www.fire.ca.gov/media/10059/2017_redbook_final.pdf.
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<http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>.
- Placer County. 2012. "Community Wildfire Protection Plan." Accessed February 27, 2020. <https://www.placer.ca.gov/DocumentCenter/View/506/Community-Wildfire-Protection-Plan-PDF>.



3.21 Mandatory Findings of Significance

Environmental Issue Area:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<i>Would the project:</i>				
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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.21.1 Impact Analysis

- 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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?***

Potentially significant unless mitigation incorporated.

The Proposed Projects would involve routine maintenance and ongoing operations of facilities. Operation and maintenance of the Proposed Projects would not greatly differ from existing operations and maintenance. Biological resources, geology and soils, recreation resources, and TCRs were found to have the potential to be affected; however, mitigation has been proposed as part of the Proposed Projects to reduce these impacts to less than significant levels. Therefore, the Proposed Projects would have potentially significant impacts, but with mitigation incorporated, impacts would be reduced to a less -than-significant level.

Mitigation Measures: See Biological Resources (Section 3.4), Geology and Soils (Section 3.7), Recreation (Section 3.16), and Tribal Cultural Resources (Section 3.18).

- 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)?***

Potentially significant unless mitigation incorporated.

The former Drum-Spaulding Hydroelectric Project consists of three separate hydroelectric projects: the Upper Drum-Spaulding Hydroelectric Project, the Lower Drum Hydroelectric Project, and the Deer Creek Hydroelectric Project. Routine maintenance impacts from the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project would be short-term, temporary, and distributed throughout the region.

NID's Yuba Bear Project (FERC Project No. 2266) and Yuba Water Agency's Yuba River Development Project (FERC Project No. 2246) are also located in the vicinity of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project. There



could be cumulative impacts from activities associated with the Proposed Projects and anticipated activities associated with the Yuba Bear Project, as described in the FEIS (FERC 2014) and/or Yuba River Development Project as described in FERC and USACE's FEIS (2019). These separate projects are not described in this CEQA analysis but are expected to have similar types of routine maintenance and similar measures meant to protect the environment that were developed during the relicensing process for each of the Proposed Projects (i.e., increased minimum instream flows and resources specific management / monitoring plans). As these projects are hydraulically linked, particularly in the Yuba and Bear river watersheds, modifications to flows could have cumulative impacts to fisheries and water quality in these rivers and streams. As noted above, the other FERC-licensed projects in the basins are in the relicensing process currently and are expected to have similar environmental protection measures as part of their new licenses.

Operation of the Proposed Projects would be generally consistent with current operations of the Drum-Spaulding Hydroelectric Project. The changes in operation are limited to modification to flows to provide enhanced conditions downstream for aquatic species; however, interactions with other projects and the Proposed Lower Drum Hydroelectric Project may impact water flows and result in stranding or detrimental flows to anadromous fish in Auburn Ravine. As discussed in Section 3.4, *Biological Resources*, mitigation has been added for the area of anadromy directly impacted by PG&E's releases into Auburn Ravine. PG&E conducted an environmental study of the Western Placer County streams but did not determine the cause of sudden low flow events that have historically stranded fish in Auburn Ravine (PG&E 2010). During the winter and early spring months of wetter years (i.e., approximately 7 out of 10 years), when there are spills from the South Canal, those spills are generally in the range of 40 cfs and 80 cfs. From mid-April through mid-October, NID begins requesting water from the South Canal to be released into Auburn Ravine, up to a maximum of 170 cfs. PCWA imports up to 50 cfs of water into Lower Auburn Ravine from the North Fork American River via the Auburn Tunnel from PCWA's American River Pump Station. These PCWA deliveries typically extend from May through October, peaking in July or August. In addition, between mid-April and mid-October, PCWA begins requesting up to 50 cfs from the South Canal (PG&E 2010).

Considering these various inputs into Auburn Ravine, many originating from South Canal but controlled by other agencies (NID and PCWA), there could be significant impacts due to changes in flows especially related to stranding of fish. In order to mitigate potentially significant impacts, MM-AQUATICS-2 (Section 3.4, *Biological*

Resources) would be implemented and describes ramping rates for flows into Auburn Ravine as well as fish stranding surveys.

The new licenses for the Proposed Projects would include provisions for some future recreation improvement projects. This future construction work may have cumulative impacts when considered together with the Proposed Projects and in other projects in the watershed, including the Yuba-Bear Project and the Yuba River Development Project. Future recreation facility improvements and expansions could cause an increase in the number of recreationists using facilities in the Proposed Projects which could cause cumulative impacts from future increased vehicle trips to transportation systems and greenhouse gas emissions in the Proposed Projects, and surrounding area. Future construction work could also have cumulative impacts on air quality due to other, near-by construction work in vicinity of the Proposed Projects. A number of activities associated with the Proposed Projects, including some future recreation improvements, have not been fully designed to a sufficient degree such that they can be analyzed at this time. As a result, the cumulative interaction of the Proposed Projects with these other construction projects is currently speculative and cannot be determined. However, each future activity associated with the Proposed Projects that has not been analyzed in this document will require future discretionary approval and appropriate environmental analysis prior to implementation. Additionally, based on existing descriptions in the Proposed Projects' FERC License Application, these future activities and relatively small and spread out over the large area, and will be implemented at different times over the term of the license. These future activities are not of a nature that they are likely to cause incremental effects that would be cumulatively considerable when viewed together with the Proposed Projects and, accordingly, the cumulative impact would less than significant.

Energy generation from the Proposed Projects and from projects in the surrounding area may have a cumulative impact on energy customers. However, as discussed in Section 3.6, Energy, PG&E's reduction in energy generation capacity is not anticipated to have a significant or negative impact to energy customers.

The environmental impacts of the Proposed Projects, with the implementation of the mitigation measures described in this section and throughout this IS/MND, are found to be individually limited and less than significant. But impacts of the Proposed Projects to aquatic biological resources could be cumulatively considerable when viewed in connection with other present and probable future hydroelectric and water supply and management projects. With the implementation of MM-AQUATICS-2, however, cumulative impacts to streams in western Placer County would be reduced to a less

than significant level. As a result, with mitigation, impacts would not be cumulatively considerable and therefore would be less than significant.

Mitigation Measures:

See Biological Resources (Section 3.4), Geology and Soils (Section 3.7), Recreation (Section 3.16), and Tribal Cultural Resources (Section 3.18)

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

No impact.

The Proposed Projects involve routine maintenance and continued operation of the Proposed Projects. This would be a positive impact on people who use recreation facilities in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas and PG&E customers. No activities associated with the Proposed Projects would either directly or indirectly cause a substantial adverse impact on human beings. Therefore, the Proposed Projects would have no impact and no mitigation is required.

Mitigation Measures: None required.

3.21.2 References

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Appendix A – Upper Drum-Spaulding Additional Information

PG&E's Upper Drum-Spaulding
Hydroelectric Project (FERC No. 2310)

Nevada and Placer Counties, California

December 2020



Prepared for:

State Water Resources Control Board

Prepared by:

HDR

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1 Introduction

This appendix provides details on the existing facilities, operations, and license conditions for the Proposed Upper Drum-Spaulding Project.

2 Existing Facilities

2.1 Spaulding No. 3 Development

The existing Spaulding No. 3 Development consists of 11 dams and reservoirs, 1 powerhouse with an installed capacity of 5.8 megawatts (MW) and associated penstocks and switchyard, 1 transmission line, and various recreation facilities. Each existing facility is described below:

- Upper Rock Lake Dam is a 16.8-foot (ft)-high, 214-ft-long earth-fill dam that impounds Texas Creek to form Upper Rock Lake, which has a gross storage capacity of 275 acre-feet (ac-ft) and a surface area of 19.8 acres at its normal maximum water surface elevation (NMWSE) of 6,714.5 ft. The dam has a crest elevation of 6,717.1 ft¹ and a 17-ft-long uncontrolled overflow spillway with a maximum capacity of 24 cubic feet per second (cfs). The dam is also equipped with an 18-inch by 24-inch rock truck tunnel that serves as the low-level outlet. The low-level outlet has a maximum capacity of 8.4 cfs. Releases from Upper Rock Lake Dam flow into Lower Rock Lake via Texas Creek.
- Lower Rock Lake Dam is a 10.5-ft-high, 110-ft-long earth- and rock-fill dam that impounds Texas Creek to form Lower Rock Lake, which has a usable storage capacity of 48 ac-ft and a surface area of 7.6 acres at its NMWSE of 6,625.8 ft. The dam has a crest elevation of 6,627.8 ft and a 30-ft-long uncontrolled overflow spillway with a maximum capacity of 33 cfs. An 8-inch-diameter pipe serves as the low-level outlet for the dam and has a maximum flow capacity of 7.3 cfs. Releases from Lower Rock Lake Dam flow into Texas Creek.
- Culbertson Lake Dam is a 20-ft-high, 255-ft-long earth- and rock-fill dam that impounds an unnamed tributary of Texas Creek to form Culbertson Lake, which has a usable storage capacity of 953 ac-ft and a surface area of 70.5 acres at its NMWSE of 6,436.4 ft. The dam has a crest elevation of 6,440.2 ft and a 23-ft-long overflow spillway with a maximum capacity of 165 cfs. A 12- to 24-inch-diameter

¹ All elevation data in this Project Description are in the National Geodetic Vertical Datum of 1929 (NGVD 29), unless otherwise specified.

pipe serves as the low-level outlet and has a flow capacity of 23.1 cfs. Releases from Culbertson Lake dam flow into Texas Creek downstream of the discharges from Lower Rock Lake via an unnamed tributary.

- Upper Lindsey Lake Dam is an 8-ft-high, 90-ft-long earth-fill dam that impounds Lindsey Creek to form Upper Lindsey Lake, which has a usable storage capacity of 18 ac-ft and a surface area of 3.9 acres at its NMWSE of 6,482.6 ft. The dam has a crest elevation of 6,485.4 ft and a 5-foot-long overflow spillway with a maximum capacity of 15 cfs. An 8-inch-diameter pipe serves as the low-level outlet and has a maximum flow capacity of 6.5 cfs. Releases from Upper Lindsey Lake Dam flow into Middle Lindsey Lake via Lindsey Creek.
- Middle Lindsey Lake Dam is a 9.5-ft-high, 335-ft-long earth-fill dam that impounds Lindsey Creek to form Middle Lindsey Lake, which has a usable storage capacity of 110 ac-ft and a surface area of 21.5 acres at its NMWSE of 6,435.7 ft. The dam has a crest elevation of 6,438.2 ft and a 37-foot-long overflow spillway with a maximum capacity of 40 cfs. A 10-inch-diameter pipe serves as the low-level outlet and has a maximum flow capacity of 11.3 cfs. Releases from Middle Lindsey Dam flow into Lower Lindsey Lake via Lindsey Creek.
- Lower Lindsey Lake Dam is a 16.6-ft-high, 335-ft-long earth- and rock-fill dam that impounds Lindsey Creek to form Lower Lindsey Lake, which has a usable storage capacity of 278 ac-ft and a surface area of 29.4 acres at its NMWSE of 6,235.6 ft. The dam has a crest elevation of 6,239.1 ft and a 42-ft-long overflow spillway with a maximum capacity of 240 cfs. A 14-inch-diameter steel pipe serves as the low-level outlet and has a maximum flow capacity of 28.1 cfs. Releases from Lower Lindsey Lake Dam flow into Texas Creek downstream of the discharges from Lower Rock Dam and Culbertson Lake Dam.

Some of the flows currently released from the above-listed existing facilities are diverted by the Nevada Irrigation District's (NID's) Texas Creek Diversion Dam into NID's Bowman-Spaulding Conduit. Both facilities are part of NID's Yuba-Bear Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. 2266. Undiverted flows continue downstream to Canyon Creek, which drains into the South Yuba River.

- Feeley Lake Dam is a 22.6-ft-high, 210-ft-long earth- and rock-fill dam that impounds Lake Creek to form Feeley Lake, which has a usable storage capacity of 739 ac-ft and a surface area of 52 acres at a NMWSE of 6,723.6 ft. The dam has a crest elevation of 6,727.6 ft and a 32-ft-long overflow spillway with a maximum capacity of 280 cfs. A 10- to 24-inch-diameter pipe serves as the low-level outlet and has a maximum flow capacity of 16.8 cfs. Releases from Feeley Lake Dam flow into Carr Lake via Lake Creek.



- Carr Lake Dam is an 8-ft-high, 185-ft-long earth- and rock-fill dam that impounds Lake Creek to form Carr Lake, which has a usable storage capacity of 150 ac-ft and a surface area of 15.8 acres at its NMWSE of 6,663.7 ft. The dam has a crest elevation of 6,667.7 ft and a 40-ft-long overflow spillway with a maximum capacity of 150 cfs. A 24-inch-diameter concrete-encased pipe serves as the low-level outlet and has a maximum flow capacity of 82.7 cfs. Some releases from Carr Lake Dam continue down Lake Creek into Fall Creek and are diverted by NID's Fall Creek Diversion Dam into NID's Bowman-Spaulding Conduit. Both facilities are part of NID's Yuba-Bear Hydroelectric Project. Undiverted flows continue downstream via Fall Creek, which also receives flows from Clear and Trap Creeks not diverted by NID into its Bowman-Spaulding Conduit, before draining into the South Yuba River.
- Blue Lake Dam is a 25-ft-high, 296-ft-long earth- and rock-fill dam that impounds Rucker Creek to form Blue Lake, which has a usable storage capacity of 1,158 ac-ft and a surface area of 59.7 acres at its NMWSE of 5,931.6 ft. The dam has a crest elevation of 5,935.6 ft and a 12-ft-long overflow spillway with a maximum capacity of 253 cfs. An 18-inch-diameter steel pipe serves as the low-level outlet and has a maximum flow capacity of 18 cfs. Releases from Blue Lake Dam flow into Rucker Lake via Rucker Creek.
- Rucker Lake Dam is a 22-ft-high, 620-ft-long earth- and rock-fill dam that impounds Rucker Creek to form Rucker Lake, which has a usable storage capacity of 648 ac-ft and a surface area of 78.6 acres at its NMWSE of 5,464.2 ft. The dam has a crest elevation of 5,468.2 ft and a 60-ft-long overflow spillway with a maximum capacity of 525 cfs. A 15- to 24-inch-diameter steel pipe serves as the low-level outlet and has a maximum flow capacity of 15 cfs. Some releases from Rucker Lake Dam continue downstream via Rucker Creek and are diverted by NID into its Bowman-Spaulding Conduit. Undiverted flows continue down the creek and drain into the South Yuba River.
- Fuller Lake Dam is a 39-ft-high, 410-ft-long earth- and rock-fill dam that impounds an unnamed tributary of Jordan Creek to form Fuller Lake, which has a usable storage capacity of 1,109 ac-ft and a surface area of 70.2 acres at its NMWSE of 5,341.8 ft. Fuller Lake receives water from NID's Bowman-Spaulding Conduit, and is used as a re-regulating pool to control the rate at which water enters Spaulding No. 3 Powerhouse for hydropower generation shaping. Fuller Lake Dam has a crest elevation of 5,343.5 ft and has a 15-ft-long siphonic spillway and a 15-ft-long auxiliary spillway with a combined maximum capacity of 425 cfs. A 14- to 24-inch outside diameter steel pipe serves as the low-level outlet and has a maximum flow capacity of 25 cfs. Releases from Fuller Lake Dam flow from an unnamed tributary into Jordan Creek, which drains into the South Yuba River.

- Spaulding No. 3 Penstocks are four 1,614.5-ft-long, 66-inch-diameter aboveground steel penstocks that release water from Fuller Lake into Spaulding No. 3 Powerhouse. The penstocks have a maximum flow capacity of 334 cfs.
- Spaulding No. 3 Powerhouse is located on the northwest side of Lake Spaulding. Pacific Gas and Electric Company (PG&E) operates this powerhouse semi-automatically in a base-loaded fashion, generating based on flows that are scheduled for consumptive water and power demands. Spaulding No. 3 Powerhouse has an installed capacity of 5.8 MW with a synchronous generator, four Francis turbines with a rated nameplate hydraulic capacity of 270 cfs. The powerhouse discharges into Lake Spaulding.
- Spaulding No. 3 Switchyard is located adjacent to the Spaulding No. 3 Powerhouse, is fenced in, and contains four Westinghouse transformers.
- Spaulding No. 3 – Spaulding No. 1 Transmission Line is a 60-kilovolt (kV), 1.1-mile-long line that connects the Spaulding No. 3 Switchyard to the Spaulding No. 1 Powerhouse Switchyard.
- Recreational facilities associated with the Spaulding No. 3 Development include: Upper Rock Lake primitive campsites (4 sites), Lower Rock Lake primitive campsites (3 sites), Culbertson Lake primitive campsites (3 sites), Middle Lindsey Lake primitive campsites (3 sites), Lower Lindsey Lake campground (12 sites), Lower Lindsey Lake trailhead (20 parking spaces), Carr Lake walk-in campground (12 sites), Carr-Feeley trailhead (30 parking spaces), Rucker Lake walk-in campground (15 sites), Fuller Lake day-use and boat launch (8 picnic sites, 14 parking spaces, and a one-lane concrete ramp), Fuller Lake angler access (6 parking spaces), Blue Lake primitive campsites (10 sites), Bear Valley group campground (1 site), and Sierra discovery trail (1 mile interpretive trail and 4 picnic sites).

2.2 Spaulding No. 1 and No. 2 Development

The existing Spaulding No. 1 and No. 2 Development consists of eight dams and reservoirs; two powerhouses with a combined installed capacity of 11.4 MW and associated tunnels, penstocks, and switchyard; one transmission line; one canal; and various recreation facilities. Each facility is described below.

- White Rock Lake Dam is a 10-ft-high, 331-ft-long earth-fill and rock-wall dam that impounds White Rock Creek to form White Rock Lake, which has a usable storage capacity of 570 ac-ft and a surface area of 88.9 acres at its NMWSE of 7,820.0 ft. The dam has a crest elevation of 7,824.0 ft and a 40-ft-long overflow spillway with a maximum capacity of 350 cfs. A 12-inch-diameter pipe serves as the low-level outlet



and has a maximum flow capacity of 18.6 cfs. Releases from White Rock Dam flow down White Rock Creek into North Creek and enter Fordyce Lake.

- Meadow Lake Dam is a 38-ft-high, 940-ft-long earth-fill and rock wall dam that impounds an unnamed tributary to form Meadow Lake, which has a usable storage capacity of 4.841 ac-ft and a surface area of 240 acres at its NMWSE of 7,281.8 ft. The dam has a crest elevation of 7,286.2 ft and a 65-ft-long overflow spillway with a maximum capacity of 1,360 cfs. A 26-inch-diameter steel pipe serves as the low-level outlet and has a maximum flow capacity of 50 cfs. Releases from Meadow Lake Dam flow into Fordyce Lake via an unnamed tributary.
- Lake Sterling Dam is a 25-ft-high, 228-ft-long rock-fill dam that impounds Bloody Creek to form Lake Sterling, which has a usable storage capacity of 1,764 ac-ft and a surface area of 104.7 acres at its NMWSE of 6,987.9 ft. The dam has a crest elevation of 6,988.7 ft and an overflow spillway controlled with flashboards during the summer months. A 20-inch-diameter pipe serves as the low-level outlet and has a maximum flow capacity of 31.9 cfs. Releases from Lake Sterling Dam flow into Fordyce Lake via Bloody Creek.
- Fordyce Lake Dam is a 156-ft-high, 1,220-ft-long rock-fill dam that impounds Fordyce Creek to form Fordyce Lake, which has a usable storage capacity of 49,426 ac-ft and a surface area of 716.2 acres at its NMWSE of 6,405.1 ft. The dam has a crest elevation of 6,406.6 ft and a 120-ft-long lateral overflow spillway controlled with two 15-ft-by-14-ft radial gates and flashboards during the summer months with a maximum capacity of 17,500 cfs. A 47-inch steel pipe serves as the low-level outlet and has a maximum flow capacity of 590 cfs. Releases from Fordyce Lake Dam flow into Lake Spaulding via Fordyce Creek.
- Kidd Lake Dam is a 35-ft-high, 449-ft-long earth- and rock-fill dam that impounds an unnamed tributary to form Kidd Lake, which has a usable storage capacity of 1,505 ac-ft and a surface area of 86.7 acres at its NMWSE of 6,627.6 ft. The dam has a crest elevation of 6,631.4 ft and a 37-ft-long uncontrolled overflow spillway. A 20- to 24-inch-diameter steel pipe serves as the low-level outlet and has a maximum flow capacity of 25 cfs. Releases from Kidd Lake Dam flow down an unnamed tributary and enter Lake Spaulding.
- Upper Peak Lake Dam is a 39-ft-high, 316-ft-long earth- and rock-fill dam that impounds Cascade Creek to form Upper Peak Lake, which has a usable storage capacity of 1,736 ac-ft and a surface area of 83.8 acres at its NMWSE of 6,607.4 ft. The dam has a crest elevation of 6,611.4 ft and a 30-ft-long overflow spillway with a maximum capacity of 680 cfs. A 20-inch-diameter steel conduit serves as the low-

level outlet and has a maximum discharge of 100 cfs. Releases from Upper Peak Lake Dam flow into Lower Peak Lake via Cascade Creek.

- Lower Peak Lake Dam is a 29-ft-high, 200-ft-long earth- and rock-fill dam that impounds Cascade Creek to form Lower Peak Lake, which has a usable storage capacity of 484 ac-ft and a surface area of 33 acres at its NMWSE of 6,581.9 ft. The dam has a crest elevation of 6,583.4 ft and a 55-ft-long overflow spillway with a maximum capacity of 312 cfs. A 21-inch-diameter steel pipe serves as the low-level outlet and has a maximum discharge of 86.7 cfs. Releases from Lower Peak Lake Dam flow down Cascade Creek and enter Lake Spaulding.
- Lake Spaulding Dams No. 1, 2, and 3: Lake Spaulding Dam No. 1 (main dam) is a 276-ft-high, 800-ft-long concrete-arch dam that impounds the South Yuba River to form Lake Spaulding. The dam has a crest elevation of 5,016.1 ft. A 30-inch-diameter pipe serves as the low-level outlet and has a maximum flow capacity of 16 cfs. Lake Spaulding Dam No. 2 is a 42-ft-high, 309-ft-long concrete-gravity dam located on an unnamed tributary to Jordan Creek. The dam has a crest elevation of 5,016.1 ft. The dam has a 271.3-ft-long overflow spillway with elevations ranging from 4,994.6 to 5,014.6 ft. The spillway is controlled by three 14-ft-by-20-ft radial gates, seven 14-ft-by-15-ft radial gates, and 14 flashboards. Lake Spaulding Dam No. 3 is a 91-ft-high, 813-ft-long concrete gravity arch dam on a topographic low point that would otherwise drain to Jordan Creek. The dam has a crest elevation of 5,019.6 ft. The dam has a 21-ft-long overflow spillway controlled by 10 bays with emergency trippable flashboards. Lake Spaulding has a usable storage area of 75,912 ac-ft and a surface area of 682 acres. The NMWSE within the reservoir is 5,014.6 ft. Releases from Lake Spaulding Dam No. 1 flow into the Spaulding No. 1 Powerhouse tunnel and Spaulding No. 2 Penstock, and releases from Lake Spaulding Dam No. 2 flow into a spill channel discharging to an unnamed tributary to Jordan Creek. Releases into the spill channel flow into Jordan Creek and then into the South Yuba River.
- Spaulding No. 1 Powerhouse Tunnel is a 963-ft-long, 104-inch-diameter rock tunnel that diverts up to 600 cfs of water from Lake Spaulding to Spaulding No. 1 Powerhouse.
- Spaulding No. 1 Powerhouse is located downstream of Lake Spaulding and discharges, along with the Spaulding No. 1 Powerhouse bypass, up to 840 cfs into Drum Canal, which is a part of the Drum No. 1 and No. 2 Development. The powerhouse features semi-automatic operation and is scheduled as base-loaded for downstream water demand. Spaulding No. 1 Powerhouse has an installed capacity of 7.0 MW with a synchronous generator and one Francis turbine with a nameplate hydraulic capacity of 600 cfs.



- Spaulding No. 1 Switchyard is located adjacent to the Spaulding No. 1 Powerhouse, is fenced in, and contains one Westinghouse transformer.
- Spaulding No. 2 Penstock diverts up to 200 cfs of water from Lake Spaulding to the Spaulding No. 2 Powerhouse.
- Spaulding No. 2 Powerhouse is located downstream of Lake Spaulding, adjacent to Spaulding No. 1 Powerhouse. This powerhouse features semi-automatic operation, and PG&E schedules it as base-loaded for downstream water demand. The powerhouse has an installed capacity of 4.4 MW with a synchronous generator and one Francis turbine with a rated nameplate hydraulic capacity of 200 cfs. Spaulding No. 2 Powerhouse discharges into the South Yuba Canal.
- Spaulding No. 2 Switchyard is located adjacent to the Spaulding No. 2 Powerhouse, is fenced in, and contains one Westinghouse transformers.
- Spaulding No. 2 – Spaulding No. 1 Transmission Line is a 2.3-kV single-circuit, 0.04-mile-long line that connects Spaulding No. 2 Switchyard to Spaulding No. 1 Switchyard.
- South Yuba Canal is 1.57 miles long and consists of a 1.3-mile-long pipe section (56 to 60 inches in diameter), a 0.41-mile-long wooden Lennon flume section (156 inches wide), and a 0.13-mile-long concrete bench flume. The canal has a maximum capacity of 146 cfs, and transfers water from the Upper Drum-Spaulding Hydroelectric Project's Lake Spaulding Dam No. 1 to the Deer Creek Hydroelectric Project's South Yuba Canal immediately downstream of Bear River Spill at YB-139 gage.
- Recreational facilities associated with the Spaulding No. 1 and No. 2 Development include: White Rock Lake primitive campsites (7 sites), Meadow Lake campground (15 sites), Meadow Lake shoreline campsites (10 sites), Meadow Knoll group campground (2 sites), Lake Sterling walk-in campground (6 sites), Kidd Lake group campground (3 sites), Lake Spaulding campground (25 sites), Lake Spaulding overflow campground (5 sites), and Lake Spaulding boat launch (67 parking spaces, two-lane concrete ramp, and 3 picnic sites).

2.3 Alta Development

The Alta Development consists of one diversion dam and canal, a forebay dam and impoundment, and one powerhouse with an installed capacity of 2.0 MW and

associated switchyard. No recreation facilities are associated with this development. Each facility is described below:

- Towle Canal Diversion Dam is a 5.5-ft-high wooden diversion dam with steel vertical slide gates.
- Towle Canal diverts water (up to 42 cfs) from Canyon Creek (primarily consisting of deliveries from Drum Forebay into Canyon Creek upstream via Towle Diversion) to Alta Forebay. The canal consists of open ditch (6.5-ft-wide by 4.5-ft-deep) and flume (96- and 108-inch Lennon flume) sections and has a total length of 3.9 miles.
- Alta Forebay Dam is a 13-ft-high, 1,500-ft-long earth-fill dam that forms Alta Forebay, which has a usable storage capacity of 19.4 ac-ft and a surface area of 5 acres at its NMWSE of 4,240.0 ft. PG&E operates Alta Forebay as a re-regulating reservoir, regulating flow into Alta Powerhouse. Alta Dam has a crest elevation of 4,243.0 ft and an 8.5-ft-long overflow spillway with a maximum capacity of 50 cfs.
- Alta Powerhouse is located below Alta Forebay, northeast of Alta, California. PG&E operates the powerhouse semi-automatically based on Placer County Water Agency's (PCWA's) downstream water demands. Alta Powerhouse has an installed capacity of 2.0 MW with a synchronous generator, two overhung impulse turbines with a combined rated nameplate hydraulic capacity of 56 cfs. The water that discharges from Alta Powerhouse enters the Alta Powerhouse tailrace area where most of it is immediately re-diverted into PCWA's Lower Boardman Canal, a non-Project facility, for downstream consumptive water demands. Undiverted flows are released to Dutch Flat Afterbay via the Little Bear River.
- Alta Switchyard is located adjacent to the Alta Powerhouse, is fenced in, and contains one Westinghouse transformer.

2.4 Drum No. 1 and No. 2 Development

The Drum No. 1 and No. 2 Development consists of three dams and reservoirs; two powerhouses with a combined installed capacity of 105.9 MW and associated tunnels, penstocks, and switchyard; one transmission line; one canal; and various recreation facilities. Each facility is described below:

- Lake Valley Reservoir Dam is a 75-ft-high, 1,035-ft-long earth- and rock-fill dam that impounds the North Fork of the North Fork American River to form Lake Valley Reservoir, which has a usable storage capacity of 7,902 ac-ft and a surface area of 303.9 acres at its NMWSE of 5,784.9 ft. The dam has a crest elevation of 5,789.9 ft and a 525-ft-long overflow spillway controlled with manually hoisted flashboards from April to September. A 30-inch pipe serves as the low-level outlet and has a



maximum flow capacity of 50 cfs. Releases from Lake Valley Reservoir Dam flow into the North Fork of the North Fork American River.

- Kelly Lake Dam is a 10.5- to 23.5-ft-high, 448-ft-long earth and rock-fill dam that impounds Sixmile Creek to form Kelly Lake, which has a usable storage capacity of 352 ac-ft and a surface area of 28 acres at its NMWSE of 5,908.8 ft. The dam has a crest elevation of 5,911.3 ft and an 18-ft-long overflow spillway controlled with manually hoisted flashboards and a maximum discharge of 490 cfs. A 20-inch-diameter pipe with a flow capacity of 25 cfs serves as the low-level outlet. Releases from Kelly Lake Dam flow into the North Fork of the North Fork American River via Sixmile Creek.
- Lake Valley Canal Diversion Dam on the North Fork of the North Fork American River diverts water released upstream from Lake Valley Reservoir and Kelly Lake to Lake Valley Canal, which delivers up to 36 cfs of water to the Drum Canal.
- Drum Canal delivers up to 840 cfs from Spaulding No. 1 Powerhouse to Drum Forebay. The canal consists of open ditch (25 to 32 ft wide by 8 to 10 ft deep), flume (13 ft wide by 8 ft deep), and tunnel (14 ft by 14 ft) sections and has a total length of 9.11 miles.
- Drum Forebay Dam is a 65-ft-high, 4,107-ft-long earth-fill dam that forms Drum Forebay, which has a usable storage capacity of 436 ac-ft and a surface area of 20 acres at its NMWSE of 4,756.0 ft. PG&E operates the dam for re-regulating purposes, regulating flow into the Drum No. 1 and No. 2 powerhouse penstocks. Drum Forebay Dam has a crest elevation of 4,766.5 ft and an 800-ft-long overflow spillway, which is not in use. A 2-ft-diameter pipe with a flow capacity of 80 cfs serves as the low-level outlet.
- Drum No. 1 Powerhouse Penstock and Drum No. 2 Powerhouse Penstock pass flows up to 643 cfs and 505 cfs from Drum Forebay to Drum No. 1 Powerhouse and Drum No. 2 Powerhouse, respectively.
- Drum No. 1 Powerhouse and Drum No. 2 Powerhouse are located on Drum Afterbay, which is part of the Dutch Flat No. 1 Development. PG&E operates the powerhouses semi-automatically as peaking plants generating for daily power demands. Drum No. 1 Powerhouse has an installed capacity of 56.4 MW (normal operating capacity is 54.0 MW) with a synchronous generator, three double overhung impulse turbines, and one single overhung impulse turbine with a rated nameplate hydraulic capacity of 643 cfs. Drum No. 2 Powerhouse has an installed capacity of 49.5 MW with a synchronous generator, with one vertical impulse turbine with a rated nameplate hydraulic capacity of 505 cfs. Flows through the powerhouses are discharged into Drum Afterbay.

- Recreational facilities associated with the Drum No. 1 and No. 2 Development include: Lodgepole campground (35 sites) and Silvertip picnic area and boat launch (10 picnic sites, 20 parking spaces, and a 1-lane concrete ramp), located at Lake Valley reservoir, and Kelly Lake picnic area (5 picnic sites), located at Kelly Lake.

2.5 Dutch Flat No. 1 Development

The Dutch Flat No. 1 Development consists of one dam and reservoir; one powerhouse with an installed capacity of 22.0 MW and associated tunnels, penstocks, and switchyard; one transmission line; and one tie. No recreation facilities are associated with this development. Each facility is described below:

- Drum Afterbay Dam is a 102-ft-high, 356-ft-long concrete arch dam located on the Bear River that forms Drum Afterbay, which has a usable storage capacity of 150.4 ac-ft and a surface area of 10 acres at its NMWSE of 3,383.3 ft. PG&E operates Drum Afterbay Dam for reregulating purposes, regulating flow from the Bear River into Dutch Flat No. 1 Tunnel and Penstock. The dam has a crest elevation of 3,385.0 ft and an 88.6-ft-long gated spillway controlled with one 20-ft by 5.5-ft skimmer gate and four 13-ft-by-6-ft radial gates. A 60-inch-diameter sluice pipe and a 10-inch-diameter release with a combined flow capacity of 1,120 cfs serve as low-level outlets. Releases from Drum Afterbay Dam flow into Dutch Flat Afterbay via the Bear River, Dutch Flat No. 1 Powerhouse Tunnel and Penstock, and Dutch Flat Forebay, which is part of NID's Yuba-Bear Hydroelectric Project via the Dutch Flat No. 2 flume (Yuba-Bear Project, Dutch Flat Development).
- Dutch Flat Tunnel is a 12-ft by 12-ft, 4.1-mile-long tunnel that has a maximum capacity of 475 cfs.
- Dutch Flat No. 1 Powerhouse Penstock is 78 to 96 inches in diameter and diverts up to 490 cfs from Drum Afterbay to Dutch Flat No. 1 Powerhouse.
- Dutch Flat No. 1 Powerhouse is located on Dutch Flat Afterbay. PG&E operates this powerhouse as a semi-automatic plant for limited peaking power demands. The powerhouse has an installed capacity of 22.0 MW with a synchronous generator, one vertical Francis unit with a rated nameplate hydraulic capacity of 490 cfs. The powerhouse discharges into Dutch Flat Afterbay.
- Dutch Flat No. 1 Transmission Line is a 115-kV single-circuit line that extends 0.12 mile from Dutch Flat No. 1 Powerhouse to the Drum-Higgins 115-kV transmission line.
- Dutch Flat No. 2 Tie is a 115-kV single-circuit line that extends 0.41 mile from Dutch Flat No. 2 Powerhouse to the 115-kV Drum-Rio Oso No. 1 Transmission Line.



2.6 Existing Stream and Reservoir Gages

Table A-1 lists 12 existing gages that PG&E uses to monitor streamflows throughout the Project.

Table A-1. Gages Maintained and Operated by PG&E in the Upper Drum-Spaulding Project

Location	USGS Gage No.	Licensee Gage No.	Location (Latitude and Longitude)		Approximate Elevation (feet)
South Yuba River – below Kidd Lake Dam and Lower Peak Lake Dam (at Cisco Grove)	11414000	YB-316	39°19'17"	120°33'52"	5,525
Fordyce Creek – below Fordyce Lake Dam	11414100	YB-200	39°22'48"	120°29'54"	6,250
Bear River at Highway 20 Crossing	11421710	YB-198	39°18'23"	120°40'44"	4,550
Bear River below Drum Afterbay	11421770	YB-44	39°15'15"	120°46'30"	3,325
South Yuba River – Below Lake Spaulding Dam (at Langs Crossing)	11414250	YB-29	39°19'07"	120°39'24"	4,460
North Fork of North Fork American River – Below Lake Valley Reservoir	—	YB-104	39°17'57"	120°35'53"	5,730
North Fork of North Fork American River – Below Lake Valley Canal Diversion Dam	—	YB-236	39°17'54"	120°36'10"	5,730
Canyon Creek – Below Towle Canal Diversion Dam	11426196	YB-282	39°14'31"	120°45'03"	4,480
Little Bear River – Below Alta Powerhouse Tailrace (Below Lower Boardman Canal Diversion Dam)	—	YB-98	39°12'57"	120°48'13"	3,590

Location	USGS Gage No.	Licensee Gage No.	Location (Latitude and Longitude)		Approximate Elevation (feet)
Lake Creek – Below Feeley Lake Dam	11414350	YB-207	39°24'01"	120°38'14"	6,710
Rucker Creek – Below Rucker Lake Dam	11414280	YB-210	39°21'20"	120°39'55"	5,350
Sixmile Creek – Below Kelly Lake Dam	—	YB-226	39°18'42"	120°34'55"	5,880

3 License Conditions

3.1 Existing Conditions

The Federal Power Commission (FPC), the predecessor to the Federal Energy Regulatory Commission (FERC), issued the initial Drum-Spaulding Project license to PG&E on June 24, 1963, effective for the period from May 1, 1963 through April 30, 2013. The initial license for the Drum-Spaulding included 44 articles that specified conditions of the license (that is, articles numbered 1 through 48 with articles 12, 13, 17, and 20 being excluded from the license). Articles 1 through 24 were from “Terms and Conditions of License for Unconstructed Project Affecting Lands of the United States,” dated December 15, 1953, and were typical of “standard” articles included in project licenses at the time. Since 1963, FERC has added 30 new articles to the Drum-Spaulding Project license. License articles numbered between 25 and 405 are considered “Project-specific” articles. Table A-2 lists the current Drum-Spaulding Project license articles, including the general topic of each article.



Table A-2. General Topic of Each Active Article in the Current Drum-Spaulding Project FERC License²

Article	Description
1	Entire Project subject to terms of license.
2, 3	FERC approval of changes.
4	Construction and operations and maintenance subject to FERC inspection.
5	Revisions to maps and plans showing Project area and boundary subject to FERC approval.
6	Installation and maintenance of stage and flow gages and meters to determine energy generated by Project.
7	Roads, trails, and other land uses on US-owned lands to be approved by appropriate federal agency or department.
8	Place and maintain suitable structures for public safety related to transmission lines, telephone lines, and other signal wires.
9	Avoid inductive interference between Project transmission lines and radio, telephone, or other communication facility.
10	Clearing of lands prior to filling reservoirs and maintaining margins of reservoirs.
11	Clearing of transmission line right-of-ways on US-owned lands.
12	Not included in the License
13	Not included in the License
14	Reasonable rules for release of water from reservoirs to protect life, property, beneficial uses, etc.
15	Provisions regarding water for fire suppression, sanitary, and domestic needs to agencies with jurisdiction on US-owned lands.
16	Licensee liability regarding buildings, bridges, roads, trails, etc. on US-owned lands.
17	Not included in the License
18	Licensee rights limited to use, occupancy, and enjoyment of lands of US related to construction, operation, and maintenance of Project.
19	Reservation of rights for US agency or state or county to take over Project roads after construction.
20	Not included in the License
21	Specified rate of return for determining surplus earnings of the Project.

² Pacific Gas and Electric (PG&E). 2011. "Application for New License, Drum-Spaulding Project." Accessed November 12, 2020.
https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20110412-5005&optimized=false.

Appendix A Upper Drum-Spaulding Additional Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)

Article	Description
22	Lease of Project works for power subject to Commission approval.
23	Licensee to retain possession of Project property covered by the license.
24	Terms and conditions of license shall not impair terms and conditions of Federal Power Act.
25	Licensee construction of Drum Number 2 Powerhouse.
26	Licensee to file revised Exhibits F and K, defining Project boundary.
27, 28	Construction of fishways and fish handling facilities.
29	Installation of additional capacity.
30	Coordination of operation with such other power systems.
31	Reservation by Commission to determine what additional transmission facilities should be included as part of Project works.
32	Licensee reimbursement to and recompensing the US (annual charges).
33	Public access to Project waters and adjacent Project lands.
34	Licensee to file recreational use plan.
35	Right of Licensee to occupy public lands in Project lakes under Act of July 26, 1866.
36	Cost of Project and net investment to be determined by Commission.
37	Cost of Project and any betterments to be determined by Commission.
38	Releases from reservoirs no greater than natural conditions.
39	Minimum streamflow requirements.
40	Maintenance of water levels in Project reservoirs.
41	Prevention of substances injurious to fish and wildlife from entering streams or waters.
42	Protection of deer in Project area.
43	Stockpile of topsoil from borrow sites and replacement upon completion of borrow operations.
44	Consultation requirements regarding historical and archeological data at Drum Number 2 Powerhouse construction site.
45	Permanent Project roads on lands in Tahoe National Forest to be constructed subject to standards of Commission.
46	Payment or disposal of cleared timber on lands of the US during construction and maintenance of Project works.
47	Prevention and suppression of fires on Project lands.
48	Submittal of plans for Commission approval for repairs of specific dams.
49	Specified rate of return for determining surplus earnings of the Project.
50	Requirement to conduct threatened and endangered plant species survey prior to construction or inundation of Fordyce development.
51	Requirement to revise Exhibits K and L for the Fordyce development
52	Safety requirement regarding Wise and Halsey forebays.



Article	Description
53	Plan for improvements to Lake Valley Dams and revision of Exhibit L drawings.
54	Verification of spillway adequacy of Lake Valley and Lake Arthur Dams.
55	Implement and modify, when appropriate, an emergency action plan for early warning to sudden releases of water.
56	Requirements for clearance of vegetation and trees along conduits and reservoirs.
57	Requirements for a feasibility analysis regarding development of drops between Bear River Canal and Halsey Forebay, South Canal and Folsom Reservoir, and Lake Valley Canal and Drum Canal.
58	Consultation requirements with environmental protection agencies during construction and operation of Project works.
59	Licensee authority to grant permission for certain types of land use without prior Commission approval.
60	Requirement to file revised Exhibit F drawings and Exhibit G maps.
61	Requirements to provide contract drawings and specifications for Regional Engineer review prior to construction.
62	Requirements for Licensee approval of contractor design and construction of cofferdams and deep excavations prior to start of construction.
63	Minimum streamflow requirement at Mormon Ravine above Newcastle Powerhouse.
64	Requirements for conducting studies for fishery and wildlife resources at Newcastle Development intake to determine minimum flows needed.
65	Requirements for consultation with the State Historic Preservation Office prior to future construction.
66	Requirements for commencement of construction of Newcastle Development.
67	Requirements for development of restoration plan for Wise 2 development.
68	Requirements for plan to protect riparian vegetation of Rock Creek.
69	Requirements to construct Wise 2 Powerhouse in a manner compatible with historical character of existing Wise powerhouse.
70	Requirements regarding time frame for construction of Wise 2 Powerhouse development.
71	Requirements to provide contract drawings and specifications for pertinent features of Project additions to FERC prior to start of construction.
72	Requirements for submitting revised Exhibit F drawings and supporting design report showing final design of major project works.
73	Requirements for filing revised Exhibits F and G for approval.

Article	Description
401	Requirements to file a plan to monitor water temperature in Bear River at the Highway 20 gage and at release from South Yuba Canal.
402, 403, 404, 405	Requirements regarding abandonment of Upper Boardman Canal.

In addition to the FERC license requirements, PG&E entered into three agreements with resource agencies that included various streamflow-related requirements. On April 11, 1963, agreement between PG&E, the United States Forest Service (Forest Service), and the California Department of Fish and Game (CDFG)³, which expired April 30, 2013, PG&E agreed to release one cfs in the North Fork of the North Fork American River below Lake Valley Reservoir and one cfs below Lake Valley Canal Diversion Dam. (In May 1985, PG&E and CDFG agreed to provide a “fish water release” of three cfs in the summer [June through September] and one cfs the remainder of the year. No expiration date of the agreement was stated in the original letter and PG&E still maintains these.⁴) PG&E also agreed to drawdown provisions for Kelly Lake and Kidd Lake (modified in the June 22, 1979, agreement below) and provisions to use storage in White Rock Lake to augment flow of North Creek in summer and fall months.

A June 22, 1979, letter agreement between PG&E, the Forest Service, and CDFG acted as an interim modification to the 1963 agreement. In this agreement, PG&E agreed to make releases from Kidd Lake and Upper and Lower Peak lakes to maintain a minimum flow of 5 cfs and a maximum water temperature of 70 degrees Fahrenheit (°F) in the South Yuba River, as measured at Cisco Grove, consistent with the primary purposes of the Drum-Spaulding Project and as water conditions permit, although releases from these reservoirs prior to September 1 would be controlled to keep the lake water surfaces as high as reasonably possible during the recreation season.

Finally, in an April 21, 1987, “letter agreement” between PG&E and CDFG, PG&E agreed to bypass 0.25 cfs year-round in Little Bear River below Alta Powerhouse.

³ On January 1, 2013, California Department of Fish and Game was renamed California Department of Fish and Wildlife.

⁴ May 10, 1985 letter from PG&E to Mr. Paul Jensen at CDFG regarding various issues including flows below Lake Valley Diversion Dam.



3.2 Proposed Conditions

In its December 2014 Final Environmental Impact Statement (FEIS), FERC staff adopted without modification 25 of the conditions proposed by PG&E in its Final License Application as amended in August 2012, and noted that the Forest Service's 59 final Federal Power Act (FPA) Section 4(e) conditions dated April 10, 2014, would be included in the new license (pg. F-1-1 of FEIS).⁵ In addition, FERC staff recommended 15 additional conditions, which when added to the 37 Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters and Lands of the United States (FERC's Form L-5 Standard Articles), bring FERC staff's recommended conditions to 52. This totals 136 conditions that would be included in the new license. However, some of the conditions overlap [that is, same PG&E proposed condition adopted by FERC staff as included in the Forest Service's FPA Section 4(e) condition]. When considering overlap of conditions, the total is 103 conditions. Table A-3 lists the conditions and subparts measures; identical conditions or subparts of a condition are shown across the same row, under the appropriate recommending agency.

⁵ The Forest Service issued its FPA Section 4(e) conditions for the entire Drum-Spaulding Project (that is, before the Drum-Spaulding Project had been split into the Upper Drum-Spaulding Hydroelectric Project, Lower Drum Hydroelectric Project, and Deer Creek Hydroelectric Project). As only the Upper Drum-Spaulding Hydroelectric Project and Deer Creek Hydroelectric Project include National Forest Service lands, Forest Service' FPA 4(e) conditions pertain at least in part to each of those two projects. The US Department of the Interior, Bureau of Land Management (BLM) and Bureau of Reclamation (BOR) also filed FPA Section 4(e) conditions for the entire Drum-Spaulding Project. However, the Upper Drum-Spaulding Hydroelectric Project does not include any federal lands administered by BLM or BOR, so BLM's and BOR's FPA Section 4(e) conditions are not relevant to the Upper Drum-Spaulding Hydroelectric Project.

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Entire Project Subject to Terms and Conditions in License	Standard Art. 1	—	—	—
No Substantial Changes Without FERC Approval	Standard Art. 2	—	—	—
Substantial Conformity to Approved Exhibits	Standard Art. 3	—	—	—
Project Subject to Inspection and Supervision of FERC Regional Engineer	Standard Art. 4	—	—	—
Acquire Rights to Use Project Lands	Standard Art. 5	—	—	—
Termination or Transfer	Standard Art. 6	—	—	—
Original Cost of Project	Standard Art. 7	—	—	—
Gages	Standard Art. 8	—	—	—

⁶ In a letter dated May 9, 2014, PG&E advised FERC and the Forest Service that it agreed with this condition in the Forest Services' Revised FPA Section 4(e) Conditions filed with FERC on April 10, 2014.



Table A-3. Proposed Conditions in the New Upper Drum-Spaulling Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulling Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Installation of Additional Capacity	Standard Art. 9	—	—	—
Coordinated Operations with Other Water Projects	Standard Art. 10	—	—	—
Headwater Benefits	Standard Art. 11	—	—	—
Navigation	Standard Art. 12	—	—	—
Reasonable Use of Project by Others	Standard Art. 13	—	—	—
Place Facilities for Reduction of Liability of Contact Between Lines and Wires	Standard Art. 14	—	—	—
Construction and Maintenance of Fish and Wildlife Facilities	Standard Art. 15	—	—	—
Construction of Fish and Wildlife Facilities by the United States	Standard Art. 16	—	—	—
Recreation Facilities	Standard Art. 17	—	—	—

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Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Public Use of project Water Consistent with Project Operations	Standard Art. 18	—	—	—
Prevention of Soil Erosion	Standard Art. 19	—	—	—
Clearing Along Open Water Conduits and along Reservoirs	Standard Art. 20	—	—	—
Dredging and Excavation	Standard Art. 21	—	—	—
Construction of Navigation Facilities by the United States	Standard Art. 22	—	—	—
Operation of Navigation Facilities	Standard Art. 23	—	—	—
Power for Navigation Facilities	Standard Art. 24	—	—	—
Lights and Signals Related to Navigation	Standard Art. 25	—	—	—
Timber on Lands of the United States	Standard Art. 26	—	—	—
Suppression of Fires	Standard Art. 27	—	—	—



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Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS)⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Use of Project Waters for Fire Suppression	Standard Art. 28	—	—	—
Liability	Standard Art. 29	—	—	—
Use of Project lands by the United States	Standard Art. 30	—	—	—
Roads and Trails	Standard Art. 31	—	—	—
Avoiding Inductive Interference	Standard Art. 32	—	—	—
Treatment of Transmission Line Right-of-Ways	Standard Art. 33	—	—	—
Disposal of Mineral and Vegetation Material on United States Lands	Standard Art. 34	—	—	—
Surrender of License	Standard Art. 35	—	—	—
Rights Cease at End of License	Standard Art. 36	—	—	—
Consistency with the Federal Power Act	Standard Art. 37	—	—	—

Table A-3. Proposed Conditions in the New Upper Drum-Spaulling Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulling Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Commission Approval, Reporting, and Filing Amendments	Draft Art. 4XX (pg. F-1-1)	—	—	—
Jordan Creek Diversion Decommissioning Plan	Draft Art. 4XX (pg. F-1-3)	—	—	—
Flow Releases to the Bear River Below Drum Canal at YB-137	Draft Art. 4XX (pg. F-1-4) (Similar to PG&E's DS-AQR1, Streamflows, Part 6, Flow Releases to the Bear River below Drum Canal at YB-137, which was agreed to by the Forest Service and CDFW [pg. D-1-7 of FEIS])	—	—	—
Reservation of Authority to Prescribe Fishways	Draft Art. 4XX (pg. F-1-3)	—	—	—
Bear River Management Plan Upstream of Forest Service Lands	Draft Art. 4XX (pg. F-1-4)	—	—	—



Table A-3. Proposed Conditions in the New Upper Drum-Spaulling Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulling Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Integrated Vegetation Management Plan	Draft Art. 4XX (pg. F-1-8) (Similar to PG&E's DS-TR1, Integrated Vegetation Management Plan, and the Forest Service's No. 38, Vegetation and Non-Native Invasive Plants Management Plan, ¹ which is identical to PG&E's DS-TR1)	—	—	—
Wildlife Crossing Plan	Draft Art. 4XX (pg. F-1-8) (Similar to PG&E's DS-TR3, Consult with CDFW When Replacing Wildlife Escape and Wildlife Crossing Facilities)	—	—	—
Avian Management Plan	Draft Art. 4XX (pg. F-1-9)	—	—	—

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Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Fish Stocking Plan	Draft Art. 4XX (pg. F-1-11)	—	—	CDFW & Forest Service (pg. D-1-8)
Bat Management Plan	Draft Art. 4XX (pg. F-1-10)	—	—	—
Fish Stocking Plan	Draft Art. 4XX (pg. F-1-11)	—	—	CDFW & Forest Service (pg. D-1-8)
Recreation Streamflow Information	Draft Art. 4XX (pg. F-1-11) (Similar to PG&E's DS-RR2, Provide Recreation Flow Information, and Forest Service's No.54, Recreation Streamflow Information, which is identical to PG&E's DS-RR2)	—	—	—



Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Fire Prevention and Response Plan	Draft Art. 4XX (pg. F-1-12) (Similar to PG&E's DS-LU2, Implement Fire Prevention and Response Plan on Federal Land, and Forest Services' No. 58, Fire Management and Response Plan, ¹ which is identical to PG&E's DS-LU2)	—	—	—
Recreation Streamflow Information	Draft Art. 4XX (pg. F-1-11) (Similar to PG&E's DS-RR2, Provide Recreation Flow Information, and the Forest Service's No.54, Recreation Streamflow Information, ¹ which is identical to PG&E's DS-RR2)	—	—	—

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Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Hazardous Substance Plan	Draft Art. 4XX (pg. F-1-12)	—	—	—
Programmatic Agreement and Historic Properties Management Plan	Draft Art. 4XX (pg. F-1-12) (similar to PG&E's DS-CR1, Implement Historic Properties Management Plan)	—	—	—
Use and Occupancy	Draft Art. 4XX (pg. F-1-12)	—	—	—
DS-GEN2, Annual Employee Training (filed by PG&E with FERC on 8/31/12)	—	pgs. 678 & D-1-2	No. 25, General Resource Measures, Annual Employee Training	CDFW (pg. D-1-2)
DS-GEN3, Develop and Implement Coordinated Operations Plan for the Upper Drum-Spaulding Project, Lower Drum, Deer Creek and Yuba-Bear projects	—	pgs. 678 & D-1-2	No. 25, General Resource Measures, Coordinated Operations Plan	CDFW (pg. D-1-2)



Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Erosion and Sediment Control Plan (filed by PG&E with FERC on 4/11/14)	—	pg. 678	No. 50, Erosion and Sediment Control and Management, Erosion and Sediment Control Management Plan ¹	—
Canal Release Point Plan (filed by PG&E with FERC on 4/11/14)	—	pgs. 678 & D-1-3	No. 49, Canal Release Point Plan ¹	CDFW (pg. D-1-3)
DS-AQR1, Streamflows, Part 1, Water Year Types (filed by PG&E with FERC on 8/31/12)	—	pgs. 679 & D-1-4	No. 26, Water Year Types ¹	CDFW (pg. D-1-4)
Consultation Specific to Drum-Spaulding Project (filed by PG&E with FERC on 8/31/12)	—	pgs. 678 & D-1-1	No. 2, Consultation Specific to Drum-Spaulding Project ¹	CDFW (pg. D-1-1)

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
DS-AQR1, Streamflows, Part 2, Minimum Streamflows (filed by PG&E with FERC on 8/31/12)	—	pgs. 679 & D-1-4	No. 27, Minimum Streamflows ¹	CDFW (pg. D-1-4)
DS-AQR1, Streamflows, Part 3, Flow Settings (filed by PG&E with FERC on 8/31/12)	—	pgs. 680 & D-1-5	No. 28, Flow Setting ¹	CDFW (pg. D-1-5)
DS-AQR1, Streamflows, Part 4, Canal Outages (filed by PG&E with FERC on 8/31/12)	—	pgs. 680 & D-1-6	No. 29, Canal Outages ¹	CDFW (pg. D-1-6)
DS-AQR1, Streamflows, Part 5, Fordyce Lake Drawdown (filed by PG&E with FERC on 8/31/12)	—	pgs. 681, 683 & D-1-6)	No. 30, Fordyce Lake Drawdown ¹	CDFW



Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
DS-AQR1, Streamflows, Part 7, Spill Cessation and Minimization of Flow Fluctuations at South Yuba River (filed by PG&E with FERC on 8/31/12)	—	pgs. 680 & D-1-7	No. 31, Spill Cessation and Minimization of Flow Fluctuations at South Yuba River ¹	CDFW (pg. D-1-7)
DS-AQR2, Implement Fish Protection and Management During Canal Outages Plan (filed by PG&E with FERC on 11/18/13)	—	pgs. 681 & D-1-8	No. 33, Canal Outages Fish Rescue Plan ¹	CDFW (pg. D-1-8)
DS-AQR4, Streamflow Measurement (filed by PG&E with FERC on 4/11/14)	—	pgs. 681 & D-1-9	No. 34, Gaging Plan ¹	CDFW (pg. D-1-9)
Fish Population Monitoring Plan (filed by PG&E with FERC on 11/21/13)	—	pgs. 681 & D-1-12	No. 51, Monitoring Program, Fish Populations ¹	—

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Foothill Yellow-Legged Frog Monitoring Plan (filed by PG&E with FERC on 11/21/13)	—	pgs. 681 & D-1-12	No. 51, Monitoring Program, Foothill Yellow-Legged Frog ¹	—
Water Temperature and Stage Monitoring Plan (filed by PG&E with FERC on 4/11/14)	—	pgs. 681 & D-1-12	No. 51, Monitoring Program, Water Temperature and Stage ¹	—
Channel Morphology Monitoring Plan (filed by PG&E with FERC on 11/21/13)	—	pgs. 681 & D-1-12	No. 51, Monitoring Program, Channel Morphology ¹	—
Riparian Vegetation Monitoring Plan (filed by PG&E with FERC on 4/11/14)	—	pgs. 681 & D-1-12	No. 51, Monitoring Program, Riparian Vegetation ¹	—
DS-TR2, Monitor Animal Losses in Project Canals (filed by PG&E with FERC on 8/31/12)	—	pgs. 682 & D-1-15	No. 39, Monitor Animal Loses in Project Canals ¹	CDFW (pg. D-1-15)

Table A-3. Proposed Conditions in the New Upper Drum-SpaULDing Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-SpaULDing Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
DS-TR3, Consult with CDFW When Replacing Wildlife Escape and Wildlife Crossing Facilities (filed by PG&E with FERC on 8/31/12)	—	pgs. 682 & D-1-16	No. 40, Replacement of Wildlife Escape and Wildlife Crossing Facilities ¹	CDFW (pg. D-1-16)
DS-TR4, Bear River Management Through Bear Valley (filed by PG&E with FERC on 8/31/12)	—	pg. D-1-17	No. 50, Erosion and Sediment Control and Management, Bear River Management Plan in Bear River Above Drum Afterbay on National Forest System Lands ¹	CDFW (pg. D-1-17)
Bat Management (filed by PG&E with FERC on 12/20/13)	—	pg. D-1-20	No. 48, Bat Management	CDFW (pg. D-1-20)

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
DS-RR1, Implement Recreation Facilities Plan (filed by PG&E with FERC on 11/18/13), with some modifications proposed by FERC staff)	—	pgs. 682 & D-1-21 through D-1-36	No. 53, Recreation Plan ¹	CDFW (pgs. D-1-21 through D-1-36)
DS-TR5, Implement Bald Eagle Management Plan (filed by PG&E with FERC on 11/18/13)	—	pgs. 682 & D-1-17	No. 43, Bald Eagle Management Plan ¹	CDFW (pg. D-1-17)
DS-LU1, Implement Transportation Management Plan for Primary Project Roads (filed by PG&E with FERC on 11/18/13)	—	pgs. 683 & D-1-41	No. 57, Transportation System Management ¹	—

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
DS-AER1, Implement Visual Resource Management Plan (filed by PG&E with FERC on 11/18/13)	—	pgs. 683 & D-1-43	No. 55, Visual Resource Management Plan ¹	—
Consultation	—	—	No. 1	—
Forest Service Approval of Final Design	—	—	No. 3 ¹	—
Approval of Changes	—	—	No. 4 ¹	—
Maintenance of Improvements on or Affecting National Forest System Lands	—	—	No. 5 ¹	—
Existing Claims	—	—	No. 6	—
Compliance with Regulations	—	—	No. 7 ¹	—
Surrender of License or Transfer of Ownership	—	—	No. 8 ¹	—

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Protection of United States Property	—	—	No. 9 ¹	—
Indemnification	—	—	No. 10 ¹	—
Damage to Land, Property, and Interests of the United States	—	—	No. 11 ¹	—
Risks of Hazards on National Forest System Lands	—	—	No. 12 ¹	—
Access	—	—	No. 13	—
Crossings	—	—	No. 14 ¹	—
Surveys, Land Corners	—	—	No. 15 ¹	—
Signs	—	—	No. 16 ¹	—
Ground Disturbing Activities	—	—	No. 17 ¹	—
Use of National Forest System Roads for Project Access	—	—	No. 18	—
Access by the United States	—	—	No. 19	—



Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS)⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Road Use	—	—	No. 20 ¹	—
Hazardous Materials Management Plan	—	—	No. 21 ¹ (Similar to FERC Draft Art. 4XX, pg. F-1-12 in FEIS)	—
Pesticide-Use Restrictions on National Forest System Lands	—	—	No. 22 ¹	CDFW (pg. D-1-18)
Construction Inspections	—	—	No. 23 ¹	—
South Yuba River Supplemental Flows	—	—	No. 32 ¹	—
Modifications of 4(e) Conditions after Biological Opinion or Water Quality Certification	—	—	No. 35 ¹	—
Unattended Construction Equipment	—	—	No. 24 ¹	—

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Modifications of 4(e) Conditions in the Event of Anadromous Fish Re-Introduction	—	—	No. 36 ¹	—
Aquatic Invasive Species Management and Monitoring Plan	—	—	No. 37 ¹	—
Vegetation and Non-Native Invasive Plants Management Plan	—	—	No. 38 ¹ (Identical to PG&E's DS-TR1, Integrated Vegetation Management Plan, and modified by FERC Draft 4XX on pg. F-1-8 in FEIS)	—
Wildlife Crossings – Drum and South Yuba Canals	—	—	No 41 ¹	CDFW (pg. D-1-16)

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Wildlife Crossings – Drum and South Yuba Canals	—	—	No. 42 ¹	
Special-Status Species	—	—	No. 44 ¹	CDFW (pg. D-1-18)
Annual Review of Special-Status Species Lists and Assessment of New Species on Federal Land	—	—	No. 45 ¹	CDFW (pg. D-1-18)
Project Powerlines	—	—	No. 46 ¹	
Raptor Collisions	—	—	No. 47 ¹	
Bat Management	—	—	No. 48 ¹	
Canal Release Point Plan	—	—	No. 49 ¹	CDFW (pg. D-1-11)

Table A-3. Proposed Conditions in the New Upper Drum-Spaulding Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulding Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Erosion and Sediment Control and Management, Bear River Management Plan in Bear River Above Drum Afterbay on National Forest System Lands	—	—	No. 50 ¹	—
Monitoring Program, Western Pond Turtle Observations	—	—	No. 51 ¹	—
Monitoring Program, Aquatic Benthic Macroinvertebrates	—	—	No. 51	—
Monitoring Program, Sensitive Raptor Monitoring	—	—	No. 51 ¹	—
Large Woody Debris	—	—	No. 52 ¹	—
Recreation Streamflow Information	—	—	No. 54 ¹	—
Historic Properties Management Plan	—	—	No. 56 ¹	—



Table A-3. Proposed Conditions in the New Upper Drum-Spaulling Hydroelectric Project license as Developed during the FERC National Environmental Policy Act (NEPA) Process (Identical conditions, to the extent they apply to the Upper Drum-Spaulling Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff's Recommendation (FERC Standard Article L-5, Appendix F of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Forest Service Revised Final 4(e) Conditions (Appendix H-1 of FEIS) ⁶	Proposed by Other Agencies (Agency and Page # in FEIS)
Fire Management and Response Plan	—	—	No. 58 ¹	—
Review of Improvements on National Forest System Lands	—	—	No. 59 ¹	—
<i>Subtotal</i>	<i>54</i>	<i>26</i>	<i>71</i>	<i>25</i>

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Appendix B – Lower Drum Additional Information

PG&E's Lower Drum Hydroelectric Project
(FERC No. 14531)

Nevada and Placer Counties, California

December 2020

Prepared for:

State Water Resources Control Board

Prepared by:

HDR

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1 Introduction

This appendix provides details on the existing facilities, operations, and license conditions for the Proposed Lower Drum Project.

2 Existing Facilities

2.1 Halsey Development

The Halsey Development includes the Bear River Canal Diversion Dam, Bear River Canal, Halsey Forebay and Dam, Halsey Powerhouse Penstock and Tunnels, and Halsey Powerhouse.

- Bear River Canal Diversion Dam is a concrete-fill dam with an unlimited spillway capacity located on the Bear River. Releases from the Bear River Canal Diversion Dam flow into Lake Combie (non-Project facility) via the Bear River.
- Bear River Canal diverts up to 490 cubic feet per second (cfs) from the Bear River to Halsey Forebay. The canal has open ditch (10 feet wide by 9 feet deep), flume (10 feet wide by 7.8 feet deep), and tunnel (8 feet wide by 11 feet high) sections and a total length of 22.7 miles.
- Halsey Forebay Dam is a 42-foot-high, 850-foot-long earth-fill dam at the downstream end of the Bear River canal that forms Halsey forebay. The dam has a crest elevation of 1,821.4 feet. Pacific Gas and Electric Company (PG&E) operates Halsey Forebay for re-regulating purposes, regulating flow into Halsey Powerhouse. Releases from Halsey Forebay dam flow into the Halsey Powerhouse Penstock.
- Halsey Powerhouse Penstock is a 72-inch-diameter, 1,205-foot-long steel penstock that diverts a maximum of 490 cfs from Halsey forebay to Halsey Powerhouse. The Halsey Powerhouse Tunnels consist of two concrete-lined tunnels with a combined flow capacity of 490 cfs.
- Halsey Powerhouse is located adjacent to Halsey Afterbay. PG&E operates Halsey Powerhouse semi-automatically based on downstream water demands. Halsey Powerhouse has an installed capacity of 11 megawatts (MW) with a synchronous generator, one Francis double-overhung turbine with a rated nameplate hydraulic

capacity of 495 cfs, and a dependable capacity¹ of 11 MW. Halsey Powerhouse discharges into Halsey Afterbay.

- Recreational Facilities associated with the Halsey Development include the Halsey Forebay picnic area (9 picnic sites and 12 parking spaces).

2.2 Wise Development

The Wise Development includes Halsey Afterbay Dam and Afterbay, Upper Wise Canal, Rock Creek Dam and Reservoir, Lower Wise Canal, Wise Dam and Forebay, Wise Powerhouse Penstock, Wise Powerhouses, and one distribution line. No recreational facilities are associated with this development.

- Halsey Afterbay Dam is a 38-foot-high, 222-foot-long rock-fill dam that impounds Dry Creek to form Halsey Afterbay, which has a usable storage capacity of 76 acre-feet and a surface area of 10.3 acres. Normal maximum water surface elevation within the afterbay is 1,494.0 feet. The dam has a crest elevation of 1,499 feet mean sea level. PG&E operates Halsey Afterbay dam for re-regulating purposes, diverting flows in Dry Creek and from Halsey Powerhouse into Upper Wise Canal. The dam has an overflow spillway, and a controlled 2-foot-diameter pipe serves as the low-level outlet. Releases from Halsey Afterbay Dam flow into Rock Creek Reservoir via Upper Wise Canal; however, some of this flow discharges downstream as spillage or leakage into Dry Creek or is diverted to meet downstream non-Project consumptive water demands by Nevada Irrigation District (NID) and Placer County Water Agency (PCWA).
- Upper Wise Canal consists of an open ditch (12 feet wide by 8 feet deep), concrete flume, and natural waterway sections and has a total length 2.18 miles. The canal diverts up to 488 cfs to Rock Creek Reservoir, also operated as a re-regulating reservoir. As mentioned above, Upper Wise Canal delivers water to both Rock Creek Reservoir and to downstream areas for consumptive water demands.
- Rock Creek Reservoir Dam is a 36-foot-high, 1,020-foot-long earth-fill and multiple-concrete-arch dam that impounds Rock Creek to form Rock Creek Reservoir, which has a usable storage capacity of 482 acre-feet and a surface area of 58 acres. Normal maximum water surface elevation within the reservoir is 1,439.6 feet. The dam has a crest elevation of 1,445.1 feet. Rock Creek Reservoir Dam has a 60-foot-long passive overflow spillway. A 2-foot pipe with a maximum capacity of 80 cfs serves as the low-level outlet. PG&E operates the dam for re-regulating purposes. Releases from Rock Creek Dam flow into Wise Forebay via Lower Wise

¹ California Independent System Operator (ISO) defines “dependable capacity” as “The maximum normal capability of the Generating Unit.”



Canal; however, some of this flow is diverted for NID's water delivery point NID-1 or released downstream in Rock Creek.

- Lower Wise Canal consists of an open ditch (12 feet wide by 8 feet deep) and tunnel (8.5 feet wide by 11.2 feet deep) sections and has a total length 3.76 miles. The canal diverts up to 488 cfs to Wise Forebay, also operated as a re-regulating reservoir.
- Wise Forebay Dam is a 20-foot-high, 1,741-foot-long earth-fill dam that forms Wise Forebay, which has a usable storage capacity of 32 acre-feet and a surface area of 4.5 acres. Normal maximum water surface elevation within the forebay is 1,418.0 feet. The dam has a crest elevation of 1,422.0 feet. The dam has a 130-foot-long uncontrolled overflow spillway, which is not currently in use. A 60-inch pipe with a flow capacity of 32 cfs serves as the low-level outlet. PG&E operates Wise Forebay Dam for re-regulating purposes for flows into Wise powerhouse penstock.
- Wise Powerhouse Penstock is a 93- to 96-inch-diameter steel pipe with a total length of 8,580 feet. Wise penstock bifurcates into two separate penstocks about 1,000 feet above the Wise powerhouses, allowing up to 393 cfs to Wise Powerhouse and 80 cfs to Wise No. 2 Powerhouse.
- Wise Powerhouse is located 1.8 miles downstream of Wise Forebay. PG&E operates Wise Powerhouse semi-automatically based on downstream consumptive water demand. Wise Powerhouse has an installed capacity of 14 MW with a synchronous generator, one Francis turbine with a rated nameplate hydraulic capacity of 393 cfs, and a dependable capacity of 9.0 MW. Wise Powerhouse discharges into South Canal, where the flow is either diverted to Auburn Ravine for downstream consumptive water demands or continues to the Newcastle Powerhouse Header Box at the terminus of South Canal.
- Wise Powerhouse Distribution Line is a 12-kilovolt (kV) single-circuit line extending 5 feet from Wise Powerhouse to a connection with PG&E's interconnected system adjacent to the powerhouse yard.

2.3 Wise No. 2 Development

The Wise No. 2 Development consists of Wise No. 2 Powerhouse Penstock and Wise No. 2 Powerhouse. No recreational facilities are associated with this development.

- Wise No. 2 Powerhouse Penstock is a 1,362-foot-long 30- to 60-inch-diameter steel pipe that delivers up to 80 cfs to Wise No. 2 Powerhouse.
- Wise No. 2 Powerhouse has an installed capacity of 3.2 MW (normal operating capacity is 3.1 MW) with a synchronous generator, one Francis turbine with a rated nameplate hydraulic capacity of 80 cfs, and a dependable capacity of 3.0 MW.

PG&E operates Wise No. 2 Powerhouse semi-automatically as a base-loaded plant for downstream water demand. Wise No. 2 Powerhouse discharges into South Canal, where the flow is either diverted to Auburn Ravine for consumptive water demands or continues to the Newcastle Powerhouse Header Box at the terminus of South Canal.

2.4 Drum No. 1 and No. 2 Development

The Newcastle Development consists of South Canal, Newcastle Powerhouse Header Box, Newcastle Penstock, Newcastle Powerhouse, and one transmission line. No recreational facilities are associated with this development.

- South Canal consists of an open ditch (6.7 to 10 feet wide by 6 feet deep), flume (9 feet wide by 6 feet deep), and tunnel (6.5 feet wide by 8 feet high) sections with a total length of 5.4 miles. As noted above, South Canal currently diverts up to 375 cfs from the two Wise powerhouses to Newcastle Powerhouse Header Box. South Canal traverses over (or under in the event of a tunnel crossing) the Dutch, Secret, and Miners ravine watersheds, respectively. No water (outside of minimal leakage) is released or spilled from South Canal into these drainages.
- Newcastle Powerhouse Header Box delivers water from South Canal to Newcastle Penstock. The header box delivers a minimum instream flow, as well as periodic spills, from the South Canal into Mormon Ravine.
- Newcastle Penstock consists of concrete (84-inch-diameter) and steel (60- to 84--inch-diameter) sections with a total length of 5,649.6 feet. The penstock has a maximum flow capacity of 392 cfs that is delivered to Newcastle Powerhouse.
- Newcastle Powerhouse is located 6.0 miles downstream of Wise Powerhouse and Wise No. 2 Powerhouse. PG&E operates the Newcastle Powerhouse automatically from the Wise Switching Center as a base-loaded plant. Newcastle Powerhouse has an installed capacity of 11.5 MW with a synchronous generator, one Francis turbine with a rated nameplate hydraulic capacity of 392 cfs, and a dependable capacity of 0 MW. The water discharged from Newcastle Powerhouse flows into Folsom Lake (non-Project facility operated by the Bureau of Reclamation) via a 0.3-mile reach of Mormon Ravine.
- Newcastle Powerhouse Tap is a 500-foot-long underground 115-kV transmission line that connects Newcastle Powerhouse to the Newcastle Switchyard for the non-Project Placer-Gold Hill No. 1 and No. 2 115-kV transmission lines.

2.5 Existing Stream Gages

PG&E maintains and operates three gages to measure minimum streamflows and other flows related to the operation of the Lower Drum Project (Table B-1).



Table B-1. Stream Gages used by PG&E for the Operation of the Lower Drum Project

Location	Licensee Gage No.	Purpose of Gage	Location (Latitude and Longitude)		Elevation (feet)
Rock Creek below Rock Creek Diversion Dam	YB-86	Minimum streamflows and Canal Outages	38°56'53"	121°5'26"	1,425 (Approx.)
Dry Creek below Halsey Afterbay Dam	YB-62A	Minimum streamflows and Canal Outages	38°57'22"	121°2'38"	1,475 (Approx.)
Mormon Ravine at South Canal Release Point	YB-292	Minimum streamflows and Canal Outages	38°50'12"	121°5'43"	525 (Approx.)

3 License Conditions

3.1 Existing Conditions

The Federal Power Commission (FPC), the predecessor to the Federal Energy Regulatory Commission (FERC), issued the initial Drum-Spaulling Project license to PG&E on June 24, 1963, effective for the period from May 1, 1963, through April 30, 2013. The initial license included 44 articles that specified conditions of the license (that is, articles numbered 1 through 48 with articles 12, 13, 17, and 20 being excluded from the license). Articles 1 through 24 were from “Terms and Conditions of License for Unconstructed Project Affecting Lands of the United States,” dated December 15, 1953, and were typical of “standard” articles included in project licenses at the time. Since 1963, FERC has added 30 new articles to the license. License articles numbered between 25 and 405 are considered “Project-specific” articles. Table B-2 lists the current Drum-Spaulling Project license articles, including the general topic of each article.

Table B-2. General Topic of Each Active Article in the Current Drum-Spaulling Project FERC License²

Article	Description
1	Entire Project subject to terms of license.
2, 3	FERC approval of changes.
4	Construction and operations and maintenance subject to FERC inspection.
5	Revisions to maps and plans showing project area and boundary subject to FERC approval.
6	Installation and maintenance of stage and flow gages and meters to determine energy generated by Project.
7	Roads, trails, and other land uses on US-owned lands to be approved by appropriate federal agency or department.
8	Place and maintain suitable structures for public safety related to transmission lines, telephone lines, and other signal wires.
9	Avoid inductive interference between Project transmission lines and radio, telephone, or other communication facility.
10	Clearing of lands prior to filling reservoirs and maintaining margins of reservoirs.
11	Clearing of transmission line right-of-ways on US-owned lands.
12	Not included in the License
13	Not included in the License
14	Reasonable rules for release of water from reservoirs to protect life, property, beneficial uses, etc.
15	Provisions regarding water for fire suppression, sanitary and domestic needs to agencies with jurisdiction on US-owned lands.
16	Licensee liability regarding buildings, bridges, roads, trails, etc. on US-owned lands.
17	Not included in the License
18	Licensee rights limited to use, occupancy, and enjoyment of lands of US related to construction, operation, and maintenance of Project.
19	Reservation of rights for US agency or state or county to take over Project roads after construction.

² Pacific Gas and Electric (PG&E). 2011. "Application for New License, Drum-Spaulling Project." Accessed November 12, 2020.
https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20110412-5005&optimized=false.



Table B-2. General Topic of Each Active Article in the Current Drum-SpaULDing Project FERC License²

Article	Description
20	Not included in the License
21	Specified rate of return for determining surplus earnings of the Project.
22	Lease of Project works for power subject to Commission approval.
23	Licensee to retain possession of Project property covered by the license.
24	Terms and conditions of license shall not impair terms and conditions of Federal Power Act.
25	Licensee construction of Drum Number 2 Powerhouse.
26	Licensee to file revised Exhibits F and K, defining Project boundary.
27, 28	Construction of fishways and fish handling facilities.
29	Installation of additional capacity.
30	Coordination of operation with such other power systems.
31	Reservation by Commission to determine what additional transmission facilities should be included as part of Project works.
34	Licensee to file recreational use plan.
35	Right of Licensee to occupy public lands in Project lakes under Act of July 26, 1866.
36	Cost of Project and net investment to be determined by Commission.
37	Cost of Project and any betterments to be determined by Commission.
38	Releases from reservoirs no greater than natural conditions.
39	Minimum streamflow requirements.
40	Maintenance of water levels in Project reservoirs.
41	Prevention of substances injurious to fish and wildlife from entering streams or waters.
42	Protection of deer in Project area.
43	Stockpile of topsoil from borrow sites and replacement upon completion of borrow operations.
44	Consultation requirements regarding historical and archeological data at Drum Number 2 Powerhouse construction site.

Table B-2. General Topic of Each Active Article in the Current Drum-Spaulding Project FERC License²

Article	Description
45	Permanent Project roads on lands in Tahoe National Forest to be constructed subject to standards of Commission.
46	Payment or disposal of cleared timber on lands of the US during construction and maintenance of Project works.
47	Prevention and suppression of fires on project lands.
48	Submittal of plans for Commission approval for repairs of specific dams.
49	Specified rate of return for determining surplus earnings of the Project.
50	Requirement to conduct threatened and endangered plant species survey prior to construction or inundation of Fordyce development.
51	Requirement to revise Exhibits K and L for the Fordyce development
52	Safety requirement regarding Wise and Halsey forebays.
53	Plan for improvements to Lake Valley Dams and revision of Exhibit L drawings.
54	Verification of spillway adequacy of Lake Valley and Lake Arthur Dams.
55	Implement and modify, when appropriate, an emergency action plan for early warning to sudden releases of water.
56	Requirements for clearance of vegetation and trees along conduits and reservoirs.
57	Requirements for a feasibility analysis regarding development of drops between Bear River Canal and Halsey Forebay, South Canal and Folsom Reservoir, and Lake Valley Canal and Drum Canal.
58	Consultation requirements with environmental protection agencies during construction and operation of Project works.
59	Licensee authority to grant permission for certain types of land use without prior Commission approval.
60	Requirement to file revised Exhibit F drawings and Exhibit G maps.
61	Requirements to provide contract drawings and specifications for Regional Engineer review prior to construction.
62	Requirements for Licensee approval of contractor design and construction of cofferdams and deep excavations prior to start of construction.



Table B-2. General Topic of Each Active Article in the Current Drum-SpaULDing Project FERC License²

Article	Description
63	Minimum streamflow requirement at Mormon Ravine above Newcastle Powerhouse.
64	Requirements for conducting studies for fishery and wildlife resources at Newcastle Development intake to determine minimum flows needed.
65	Requirements for consultation with State Historic Preservation Office prior to future construction.
66	Requirements for commencement of construction of Newcastle Development.
67	Requirements for development of restoration plan for Wise 2 development.
68	Requirements for plan to protect riparian vegetation of Rock Creek.
71	Requirements to provide contract drawings and specifications for pertinent features of project additions to FERC prior to start of construction.
72	Requirements for submitting revised Exhibit F drawings and supporting design report showing final design of major Project works.
73	Requirements for filing revised Exhibits F and G for approval.
401	Requirements to file a plan to monitor water temperature in Bear River at the Highway 20 gage and at release from South Yuba Canal.
402, 403, 404, 405	Requirements regarding abandonment of Upper Boardman Canal.

In addition to the FERC license requirements, PG&E entered into three agreements with resource agencies that included various streamflow-related requirements. In an April 11, 1963, agreement between PG&E, the US Forest Service, and the California Department of Fish and Game (CDFG), which expired April 30, 2013, PG&E agreed to release 1 cfs in the North Fork of the North Fork American River below Lake Valley Reservoir and 1 cfs below Lake Valley Canal Diversion Dam. In May 1985, PG&E and CDFG agreed to provide a “fish water release” of 3 cfs in the summer (June through September) and 1 cfs the remainder of the year. No expiration date of the agreement

was stated in the original letter and PG&E still maintains these.³ PG&E also agreed to drawdown provisions for Kelly Lake and Kidd Lake (modified in the June 22, 1979, agreement below) and provisions to use storage in White Rock Lake to augment flow of North Creek in summer and fall months.

A June 22, 1979, letter agreement between PG&E, US Forest Service, and CDFG acted as an interim modification to the 1963 agreement. In this agreement, PG&E agreed to make releases from Kidd Lake and Upper and Lower Peak Lakes to maintain a minimum flow of 5 cfs and a maximum water temperature of 70 degrees Fahrenheit (°F) in the South Yuba River, as measured at Cisco Grove, consistent with the primary purposes of the Project and as water conditions permit, although releases from these reservoirs prior to September 1 would be controlled to keep the lake water surfaces as high as reasonably possible during the recreation season.

Finally, in an April 21, 1987, "letter agreement" between PG&E and CDFG, PG&E agreed to bypass 0.25 cfs year-round in Little Bear River below Alta Powerhouse.

3.2 Proposed Conditions

In its December 2014 Final Environmental Impact Statement (FEIS), FERC staff adopted without modification 17 of the measures proposed by PG&E in its Final License Application, as amended; recommended 48 additional measures; and noted that the Bureau of Reclamation's 15 final Federal Power Act (FPA) Section 4(e) conditions dated October 21, 2013, would be included in the new license. Some of these measures were recommended by California Department of Fish and Wildlife (CDFW)⁴ and the United States Fish and Wildlife Service during relicensing.

Besides these conditions, FERC would include in any new license for the Lower Drum Project FERC's 37 Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters and Lands of the United States (Form L-5 Standard Articles). Combined, the FEIS included 80 measures. Table B-3 lists the measures; identical conditions are shown across the same row, under the appropriate recommending agency.

³ May 10, 1985, letter from PG&E to Mr. Paul Jensen at CDFG regarding various issues including flows below Lake Valley Diversion Dam.

⁴ On January 1, 2013 California Department of Fish and Game was renamed California Department of Fish and Wildlife



Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS)⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Entire Project Subject to Terms and Conditions in License	Standard Art. 1	—	—	—
No Substantial Changes Without FERC Approval	Standard Art. 2	—	—	—
Substantial Conformity to Approved Exhibits	Standard Art. 3	—	—	—
Project Subject to Inspection and Supervision of FERC Regional Engineer	Standard Art. 4	—	—	—

⁵ Federal Energy Regulatory Commission (FERC). 2014. "Final Environmental Impact Statement for Hydropower License." Accessed November 12, 2020.

https://elibrary.ferc.gov/eLibrary/filelist?document_id=14283202&optimized=false

⁶ Bureau of Reclamation 4(e) conditions B-1 through B-14 are related to the operation and maintenance of Newcastle Powerhouse.

Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS) ⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Acquire Rights to Use Project Lands	Standard Art. 5	—	—	—
Termination or Transfer	Standard Art. 6	—	—	—
Original Cost of Project	Standard Art. 7	—	—	—
Gages	Standard Art. 8	—	—	—
Installation of Additional Capacity	Standard Art. 9	—	—	—
Coordinated Operations with Other Water Projects	Standard Art. 10	—	—	—
Headwater Benefits	Standard Art. 11	—	—	—
Navigation	Standard Art. 12	—	—	—
Reasonable Use of Project by Others	Standard Art. 13	—	—	—
Place Facilities for Reduction of Liability of Contact Between Lines and Wires	Standard Art. 14	—	—	—
Construction and Maintenance of Fish and Wildlife Facilities	Standard Art. 15	—	—	—



Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS)⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Construction of Fish and Wildlife Facilities by the United States	Standard Art. 16	—	—	—
Recreation Facilities	Standard Art. 17	—	—	—
Public Use of Project Water Consistent with Project Operations	Standard Art. 18	—	—	—
Prevention of Soil Erosion	Standard Art. 19	—	—	—
Clearing Along Open Water Conduits and along Reservoirs	Standard Art. 20	—	—	—
Dredging and Excavation	Standard Art. 21	—	—	—
Construction of Navigation Facilities by the United States	Standard Art. 22	—	—	—
Operation of Navigation Facilities	Standard Art. 23	—	—	—
Power for Navigation Facilities	Standard Art. 24	—	—	—

Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS)⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Lights and Signals Related to Navigation	Standard Art. 25	—	—	—
Timber on Lands of the United States	Standard Art. 26	—	—	—
Suppression of Fires	Standard Art. 27	—	—	—
Use of Project Waters for Fire Suppression	Standard Art. 28	—	—	—
Liability	Standard Art. 29	—	—	—
Use of Project lands by the United States	Standard Art. 30	—	—	—
Roads and Trails	Standard Art. 31	—	—	—
Avoiding Inductive Interference	Standard Art. 32	—	—	—
Treatment of Transmission Line Right-of-Ways	Standard Art. 33	—	—	—
Disposal of Mineral and Vegetation Material on United States Lands	Standard Art. 34	—	—	—
Surrender of License	Standard Art. 35	—	—	—



Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS) ⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Rights Cease at End of License	Standard Art. 36	—	—	—
Consistency with the Federal Power Act	Standard Art. 37	—	—	—
DS-GEN3, Coordinated Operations Plan	Draft Article 4XX (pg. F-2-1)	741	—	CDFW 10j #1.2
DS-GEN2, Annual Employee Training	Draft Article 4XX (pg. F-2-2)	741	—	CDFW 10j #1.1
Reservation of Authority to Prescribe Fishways	Draft Article 4XX (pg. F-2-2)	—	—	—
Canal Release Point Plan (filed by PG&E with FERC on 4/11/14)	Draft Article 4XX (pg. F-2-2)	742	—	CDFW 10j #11
Erosion and Sediment Control and Management Plan (filed by PG&E with FERC on 4/11/14)	Draft Article 4XX (pg. F-2-2)	742	—	CDFW 10j #22, #27, and #28
Water Year Types	Draft Article 4XX (pg. F-2-2)	742	—	CDFW 10j #2.1

Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS)⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
DS-AQR1, Minimum Streamflows	Draft Article 4XX (pg. F-2-3)	742	—	CDFW 10j #2.2
Coordination of the Lower Drum Project and the Yuba-Bear Project Operations Regarding the Yuba-Bear Project's Streamflow Requirements in the Bear River Below Rollins Reservoir at Gage YB-196.	Draft Article 4XX (pg. F-2-7)	742	—	CDFW 10j #2.3
Minimum Streamflow During Canal Outages	Draft Article 4XX (pg. F-2-7)	742	—	CDFW 10j #2.5
DS-AQR2, Canal Outage Fish Rescue Plan	Draft Article 4XX (pg. F-2-7)	743	—	CDFW 10j #3
DS-AQR4, Gaging Plan	Draft Article 4XX (pg. F-2-7)	742	—	CDFW 10j #4
Aquatic Invasive Species Management and Monitoring Plan	Draft Article 4XX (pg. F-2-7)	743	—	CDFW 10j #6



Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS)⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Fish Population Monitoring Plan (filed by PG&E with FERC on 11/21/13)	Draft Article 4XX (pg. F-2-8)	743	—	CDFW 10j #8
Incidental Observations of Western Pond Turtles	Draft Article 4XX (pg. F-2-8)	743	—	CDFW 10j #8
Aquatic Benthic Macroinvertebrate Monitoring Plan	Draft Article 4XX (pg. F-2-8)	—	—	CDFW 10j #8
Water Temperature and Stage Monitoring Plan (filed by PG&E with FERC on 4/11/14)	Draft Article 4XX (pg. F-2-8)	—	—	CDFW 10j #8
Integrated Vegetation Management Plan	Draft Article 4XX (pg. F-2-9)	—	—	CDFW 10j #7.1
DS-TR2, and TR3, Wildlife Crossing Plan	Draft Article 4XX (pg. F-2-9)	—	—	CDFW 10j #7.2, #7.5, and #7.4

Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS) ⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Bat Management (filed by PG&E with FERC on 12/20/13)	Draft Article 4XX (pg. F-2-10)	—	—	CDFW 10j #7.12
DS-TR5, Bald Eagle Management Plan (filed by PG&E with FERC on 11/21/13)	Draft Article 4XX (pg. F-2-11)	743	—	CDFW 10j #7.7
Avian Management Plan	Draft Article 4XX (pg. F-2-11)	—	—	CDFW 10j #7.10 and #7.11
Fish Stocking Plan	Draft Article 4XX (pg. F-2-12)	—	—	CDFW 10j #17
DS-RR1, Implement Recreation Facilities Plan (filed by PG&E with FERC on 11/18/13), with some modifications)	Draft Article 4XX (pg. F-2-12)	744	—	CDFW 10j #16, #12, and #15



Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS) ⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
DS-LU1, Implement Transportation Management Plan for Primary Project Roads (filed by PG&E with FERC on 8/29/12)	Draft Article 4XX (pg. F-2-12)	—	—	—
Fire Prevention and Response Plan	Draft Article 4XX (pg. F-2-12)	—	—	—
Hazardous Substances Plan	Draft Article 4XX (pg. F-2-12)	—	—	CDFW 10j #23
Programmatic Agreement and Historic Properties Management Plan	Draft Article 4XX (pg. F-2-13)	744	—	—
Use and Occupancy	Draft Article 4XX (pg. F-2-13)	—	—	—
Reservation of Authority to Modify Conditions	—	—	A-1	—

Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS) ⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Consultation	—	741	B-1	CDFW 10j #1 and #10
Approval of Changes	—	—	B-2	—
O&M of Newcastle Powerhouse and Appurtenances	—	—	B-3	—
Surrender of License or Transfer of Ownership	—	—	B-4	—
Protection of United States Property	—	—	B-5	—
Indemnification and Hold Harmless	—	—	B-6	—
Damage to Land, Property, and Interests of the United States	—	—	B-7	—
Unrestricted Access	—	—	B-8	—
Pesticide-Use Restrictions on Reclamation Lands	—	—	B-9	CDFW 10j #16
Hazardous Materials	—	—	B-10	—



Table B-3. Proposed Conditions in the New Lower Drum Hydroelectric Project License as Developed during the FERC National Environmental Policy Act (NEPA) Process⁵ (Identical conditions, to the extent they apply to the Lower Drum Hydroelectric Project, are shown along the same row.)

Condition	Standard Articles and FERC Staff Recommendation (FERC Standard Article L-5, Appendix F-2 of FEIS, or Page # in FEIS)	PG&E Proposed Conditions Adopted by FERC Staff Without Modification (Page # in FEIS)	Reclamation Final 4(e) Condition (Appendix H of FEIS)⁶	Proposed by Other Agencies (Table 5-5 in FEIS)
	Article # or Page #	Page #	Condition #	Agency
Discovery of Cultural Resources	—	—	B-11	—
Health and Safety	—	—	B-12	—
Reclamation Land Use Stipulation	—	—	B-13	—
Removal of Structures	—	—	B-14	—
<i>Subtotal</i>	<i>65</i>	<i>17</i>	<i>15</i>	<i>25</i>

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Appendix C – Upper Drum-Spaulding & Lower Drum Biological Resources Information

PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310) and Lower Drum Hydroelectric Project (FERC No. 14531)

Nevada and Placer Counties, California
December 2020

Prepared for:

State Water Resources Control Board

Prepared by:

HDR

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1. Biological Resources Technical Memorandum

1.1 Methodology

The following data reviews, relicensing studies, and analyses were performed and/or reviewed to characterize the environmental setting of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project (collectively referred to as Proposed Projects) areas, and to determine what potential effects activities associated with the Proposed Projects could have on biological resources.

1.2 Literature Review

The following sources were used to characterize the environmental setting across the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Documentation for the Proposed Projects was reviewed for site-specific data regarding habitat suitability for special-status species. Preliminary database searches were also performed to identify special-status species and their habitats, as well as aquatic resources, with the potential to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, using the following databases:

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation System (2020a)
- USFWS Critical Habitat Portal (2020b)
- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database QuickView Tool in BIOS 5 (2020a)
- California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California (2020)
- National Marine Fisheries Service (NMFS) California Species List Tool (2020)
- Region 5 Regional Forester's Sensitive Animal Species List for the Tahoe National Forest (U.S. Forest Service [USFS] 2013a)
- Region 5 Regional Forester's Sensitive Plant Species List for the Tahoe National Forest (2013b)
- Google Earth aerial imagery (2020)
- U.S. Geological Survey (USGS) topographic maps

The USFWS databases were queried to identify federally listed species and critical habitats that have the potential to be affected by the Proposed Projects. A query of the

California Natural Diversity Database provided a list of processed and unprocessed special-status species occurrences in the Auburn, Chicago Park, Colfax, Gold Hill, Lake Combie, and Pilot Hill, California, USGS 7.5-minute quadrangles (quads), which overlap with the Proposed Lower Drum Project area. The following USGS quads overlap with and were queried for the Proposed Upper Drum-Spaulding Project: Blue Canyon, Cisco Grove, Dutch Flat, English Mountain, Graniteville, Soda Springs, Washington, Webber Peak, and Westville. In addition, all quads adjacent to the aforementioned quads were included in the query. The CNPS database was queried to identify special-status plant species with the potential to occur in the aforementioned USGS quads. The NMFS database was also queried in the USGS quads that overlap with the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas to identify species, essential fish habitat, and/or critical habitat under its jurisdiction with the potential to occur. Lastly, the Forest Service Sensitive Species Lists were reviewed to identify any plant and wildlife species that are recognized by the Forest Service as sensitive (FSS).

1.3 Relicensing Studies

As part of the relicensing process, 11 terrestrial resources studies, 3 threatened and endangered species studies, and 16 aquatic resources studies were conducted between 2009 and 2011. The final technical memoranda for the completed studies have been posted to the relicensing website¹ and are filed with the Final License Application (FLA) in Appendix E12. These studies are summarized in Table C-1.

Table C-1. Summary of Relicensing Studies

Study Number	Study Name	Tech Memo Number	Year Completed
<i>Terrestrial Resources Studies</i>			
2.3.9	Special-Status Aquatic Reptiles – Western Pond Turtle	3-9	2010
2.3.14	Western Pond Turtle Basking	3-14	2010
2.4.1	Special-Status Wildlife Movement – CWHR	4-1	2010
2.4.2	Wildlife: Movement	4-2	2010
2.4.2	Wildlife: Bats	4-3	2010
2.5.1	Special-Status Plants	5-1	2010
2.6.1	Riparian Habitat	6-1	2010
2.6.2	Wetlands	6-2	2010
2.7.4	CESA-Listed and Protected Wildlife – CWHR	7-4	2010

¹ Pacific Gas and Electric (PG&E). 2020. Drum-Spaulding Public Relicensing Website. Accessed November 12, 2020. <http://www.eurekasw.com/DS/default.aspx>.



Table C-1. Summary of Relicensing Studies

Study Number	Study Name	Tech Memo Number	Year Completed
2.7.5	CESA-Listed Wildlife - Bald Eagle	7-5	2010
2.7.6	CESA-Listed Plants	7-6	2009
<i>Threatened and Endangered Species Studies</i>			
2.7.1	ESA-Listed Amphibians – California Red-Legged Frog	7-1	2010
2.7.2	ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle	7-2	2010
2.7.3	ESA-Listed Plants	7-3	2010
<i>Aquatic Resources Studies</i>			
2.3.1	Stream Fish Populations	3-1	2010
2.3.2	Instream Flow	3-2	2010
2.3.4	Fish Passage	3-4	2010
2.3.5	Fish Entrainment	3-5	2011
2.3.6	Special-Status Amphibians – FYLF Surveys	3-6	2010
2.3.7	Special-Status Amphibians – FYLF Habitat Modeling	3-7	2010
2.3.8	Special-Status Amphibians – SNYLF Surveys	3-8	2010
2.3.9	Special-Status Reptiles – WPT	3-9	2010
2.3.10	Aquatic Macroinvertebrates	3-10	2010
2.3.11	Special-Status Mollusks	3-11	2010
2.3.12	Reservoir Fish Populations	3-12	2010
2.3.13	Western Placer County Streams	3-13	2010
2.3.14	Western Pond Turtle Basking	3-14	2010
2.3.15	2010 Dutch Flat No 2. Entrainment Netting	3-15	2010
2.3.16	Fish Barriers	3-16	2011
2.3.17	2011 Dutch Flat No 2. Entrainment Netting	3-17	2011

Notes: CWHR = California Wildlife Habitat Relationships, CESA = California Endangered Species Act, ESA = Endangered Species Act, FYLF = foothill yellow-legged frog, SNYLF = Sierra Nevada yellow-legged frog, WPT = western pond turtle

The results of these studies, along with other information surrounding biological resources in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, are synthesized in the Final Environmental Impact Statement (FEIS) (Federal Energy Regulatory Commission [FERC] 2014) and FLA (Pacific Gas and Electric [PG&E] 2011). These documents were reviewed to help inform the biological setting.

1.4 Impact Analysis

The impact analysis was based on the descriptions of the Proposed Projects; the environmental setting; and on federal, state, and local regulatory requirements regarding effects on biological resources. In addition, the impact analysis used data collected from the literature review and previous relicensing studies. When information about the presence of a particular special-status species was unknown, but suitable habitat was present, the impact analysis took a conservative approach by inferring the presence of special-status species in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas until additional surveys determine otherwise. Impacts on specific biological resources are identified and appropriate avoidance, minimization, compensation, mitigation measures, and/or relevant conditions and/or implementation plans associated with the Proposed Projects are discussed further below.

2. Vegetation Communities and Habitats

Vegetation communities are assemblages of plant species that occur in the same area and are defined by species composition and relative abundance. Given the large size of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, the descriptions of vegetation communities have been simplified such that they are described in terms of elevation ranges and include the dominant and common associate plant species found in each. These elevation ranges somewhat overlap and integrate with each other, forming transition zones on their outer edges.

The locations of features included in the Upper Drum-Spaulding Hydroelectric Project range in elevation from 7,820 feet (ft) at White Rock Reservoir (above Fordyce Lake) to 2,755 ft at Dutch Flat No.1 powerhouse. Lower Drum Hydroelectric Project facilities range in elevation from 1,960 ft at the Bear River Canal Diversion Dam to 435 ft at Newcastle powerhouse.

A mix of conifer, hardwood, chaparral, riparian, and serpentinite communities can be found at elevations below 5,000 feet. Dominant vegetation in the conifer communities includes incense cedar (*Calocedrus decurrens*), Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), madrone (*Arbutus menziesii*), and sugar pine (*Pinus lambertiana*). Additionally, stands of Brewer's oak (*Quercus garryana* var. *breweri*) occupy south-facing slopes and areas of annual grasslands. Chaparral species include whiteleaf manzanita (*Arctostaphylos viscida*), greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), wedgeleaf ceanothus (*Ceanothus cuneatus*), deerbrush (*Ceanothus integerrimus*), and poison oak (*Toxicodendron diversilobum*). Riparian areas are dominated by white alder (*Alnus rhombifolia*), maples (*Acer* spp.), and willows (*Salix* spp.). In addition, several outcrops of habitat



characterized by serpentine soil are present in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Dominant plants in these areas are leather oak (*Quercus durata*), gray pine (*Pinus sabiniana*), and wedgeleaf ceanothus. Additional serpentine indicator species include milkwort jewelflower (*Streptanthus polygaloides*) and yellow pincushion (*Chaenactis glabriuscula*) (FERC 2014).

At elevations above 5,000 feet, forested areas are dominated by an incense cedar, red fir (*Abies magnifica*), white fir, and Jeffrey pine (*Pinus jeffreyi*) overstory. Lodgepole pines (*Pinus contorta* var. *murrayana*) exist in moist soils in meadows and along shorelines. Black oak (*Quercus kelloggii*), willow, quaking aspen (*Populus tremuloides*), and mountain alder (*Alnus incana*) are common deciduous trees and may form a subcanopy beneath the conifer overstory. Some areas are barren, devoid of vegetation because of the rocky and steep terrain with little to no soil layer. The shrub layer is dominated by mountain whitethorn, huckleberry oak (*Quercus vacciniifolia*), pinemat manzanita (*Arctostaphylos nevadensis*), and bush chinquapin (*Chrysolepis sempervirens*) (FERC 2014).

Vegetation community mapping from the Forest Service Classification and Assessment with Landsat of Visible Ecological Groupings data were cross-referenced with CDFW's California Wildlife Habitat Relationship (CWHR) classification system to create habitat maps for the Proposed Upper Drum-Spaulding Project area and Proposed Lower Drum Project area, respectively. Each CWHR habitat type in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas is listed in Table C-2 and their locations are shown in the maps attached to this appendix. General descriptions of each habitat type, including physical conditions and dominant species, can be found on the Wildlife Habitats – California Wildlife Habitat Relationships System website (CDFW 2020b). It should be noted that the location and extent of these habitats have not been ground-truthed.

Table C-2. CWHR Habitats

Habitat	Upper Drum-Spaulding	Lower Drum
Annual Grassland (AGS)	X	X
Aspen (ASP)	X	
Barren (BAR)	X	
Blue Oak-Foothill Pine (BOP)		X
Blue Oak Woodland (BOW)		X
Cropland (CRP)		X
Douglas Fir (DFR)		X
Jeffrey Pine (JPN)	X	
Lacustrine (LAC)	X	X
Mixed Chaparral (MCH)	X	X

Table C-2. CWHR Habitats

Habitat	Upper Drum-Spaulding	Lower Drum
Montane Hardwood (MHW)	X	X
Montane Hardwood-Conifer (MHC)	X	X
Montane Riparian (MRI)	X	X
Perennial Grassland (PGS)	X	
Ponderosa Pine (PPN)	X	X
Red Fir (RFR)	X	
Riverine (RIV)	X	
Sierran Mixed Conifer (SMC)	X	X
Urban (URB)	X	X
Valley Oak Woodland (VOW)		X
Wet Meadow (WTM)	X	
White Fir (WFR)	X	

3. Special-status Natural Communities and Aquatic Resources

Sensitive communities and aquatic resources included are those that are protected under CDFW, Sections 1600–1603 of the California Fish and Game Code (FGC), and/or Sections 401 and Section 404 of the Clean Water Act. Sensitive habitats typically either contain special-status species, their associated habitat, or are sufficiently rare themselves to warrant protection as ranked by the NatureServe Heritage Program Status Rank (Faber-Langendoen et al. 2012).

Aquatic resources provide a variety of habitat functions for plants and wildlife including foraging, cover, migration, and movement corridors for both special-status and common species. In addition to habitat functions, these features provide physical conveyance of surface water flows capable of handling large storm events. Large storms can produce extreme flows that cause bank cutting and sedimentation of open waters and streams. Aquatic resources can slow these flows and lessen the effects of large storm events, protecting habitat and other resources.

In the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, aquatic resources and their associated riparian corridors would be considered sensitive communities due to their unique hydrophytic vegetation and ability to support special-status species. These areas include, but are not limited to, reservoirs, streams, riparian areas, and wetlands.



The Tahoe National Forest considers stands of quaking aspen a community of concern and specifically asked that this species be surveyed as part of the relicensing studies. Quaking aspens and their associated riparian habitats are the most species-rich avian habitats in the Sierra Nevada, making them disproportionately more important than other habitats in the Proposed Upper Drum-Spaulding Project and Proposed lower Drum Project areas to birds and other wildlife (USFS 2018). Thirty-eight occurrences of quaking aspen were found in the Proposed Upper Drum-Spaulding Project area during relicensing studies (none in the Proposed Lower Drum Project area). In addition, oak woodland is considered sensitive due to Placer County policies surrounding preservation of this community (FERC 2014).

The high-level CWHR habitat mapping described in Section 2, *Vegetation Communities and Habitats*, is not meant to capture the exact extent and location of communities, nor does it classify areas at a refined vegetation alliance level. For these reasons, it is likely that additional sensitive communities occur other than those mentioned here, such as those defined as sensitive by the NatureServe Heritage Program.

4. Fisheries Habitat and Essential Fish Habitat

4.1 Upper Drum-Spaulding Fish Habitat

Fisheries habitat present in the Proposed Upper Drum-Spaulding Project area includes 24 reservoirs, forebays, and afterbays; 1 diversion dam; 3 canals; and 27 stream reaches. For more information on each of these waterbodies, refer to the FEIS (FERC 2014) and the FLA (PG&E 2011). Streams and reservoirs across both of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas support rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), and a transitional warm water fish assemblage in lower-elevation areas. Prior to the introduction of nonnative fish species, the Sierra Nevada native fish populations in accessible lakes and streams of the Sacramento-San Joaquin drainage included 22 taxa, including three anadromous fish: Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*, anadromous form), and Pacific lamprey (*Entosphenus tridentatus*; NID 2008).

The abundance and distribution of native fish species in Sierra Nevada streams, rivers, and lakes has dramatically changed as a result of several factors, including the introduction of nonnative species, construction of dams and diversions, alteration of aquatic habitat, and watershed disturbance (Moyle et al. 1997). Prior to construction of the Englebright Dam for control of mining debris in 1941, the Yuba River supported anadromous populations of spring-run Chinook salmon, fall-run Chinook salmon, and steelhead. Currently operated by the U.S. Army Corps of Engineers (USACE), Englebright Dam defines the upstream limit of salmon and steelhead migration, and

none of these species are present in the existing Proposed Upper Drum-Spaulding Project area or any affected reaches (NMFS 2014).

Rainbow trout support recreational fisheries in the Proposed Upper Drum-Spaulding Project area. Rainbow trout is native to most west-side Sierra Nevada watersheds below an elevation of 4,900 feet above mean sea level but has been introduced to higher-elevation waters including much of the Proposed Upper Drum-Spaulding Project area. Many of the larger lakes/reservoirs are managed for and receive heavy recreational fishing pressure; annual stocking is a key component of CDFW's recreational fishery management program. Although natural reproduction occurs in some waters associated with the Proposed Projects, stocking is necessary to sustain populations of game fish in waters with high angler usage. PG&E has proposed and agreed to fund the stocking of Lake Spaulding for recreational use.

4.2 Lower Drum Fish Habitat

Fisheries habitat present in the Proposed Lower Drum Project area includes five dams and reservoirs, forebays and afterbays, two diversion dams, four canals, and four stream reaches. The reservoirs associated with the Proposed Lower Drum Project include the Bear River Canal Diversion dam on the Bear River, the Halsey Forebay (off-channel), the Halsey Afterbay on Dry Creek, the Rock Creek Reservoir on Rock Creek, and the Wise Forebay (off-channel). Proposed Lower Drum Project facilities affect flows in Dry Creek below Halsey afterbay, Rock Creek below Rock Creek reservoir, Auburn Ravine² below South Canal, and Mormon Ravine below Newcastle powerhouse. See Figure C-1 for a map of the extent of anadromy in Auburn Ravine.

4.3 Essential Fish Habitat in Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project Areas

The Magnuson-Stevens Act requires federal agencies to consult with NMFS on all actions that may adversely affect essential fish habitat (EFH). EFH has been designated for Pacific salmon in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas (50 Code of Federal Regulations [CFR] 660.4391 and 660.392). The designation does not identify specific salmon species or races (for example, spring-run or fall-run); however, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley fall- and late-fall-run Chinook salmon are species that occur in the Central Valley and are managed under the *Pacific Coast Salmon Fisheries Management Plan*. The Vanjop Diversion

² The upper extent of anadromy in Auburn Ravine is at RM 26.6, which is proximally downstream of the South Canal input.

Dam on the Bear River and the Bureau of Recreation's Folsom Project at Nimbus Dam prevents passage of anadromous fishes into the Proposed Lower Drum Project area through the Bear and American Rivers. Passage of anadromous fish within the Sacramento River Basin to Auburn Ravine is possible. USACE's Englebright Dam prevents passage of anadromous fishes into the Proposed Upper Drum-Spaulding Project area, including Chinook salmon; therefore, no species that are covered by EFH designations can naturally occur in the Proposed Upper Drum-Spaulding Project area (NMFS 2014).

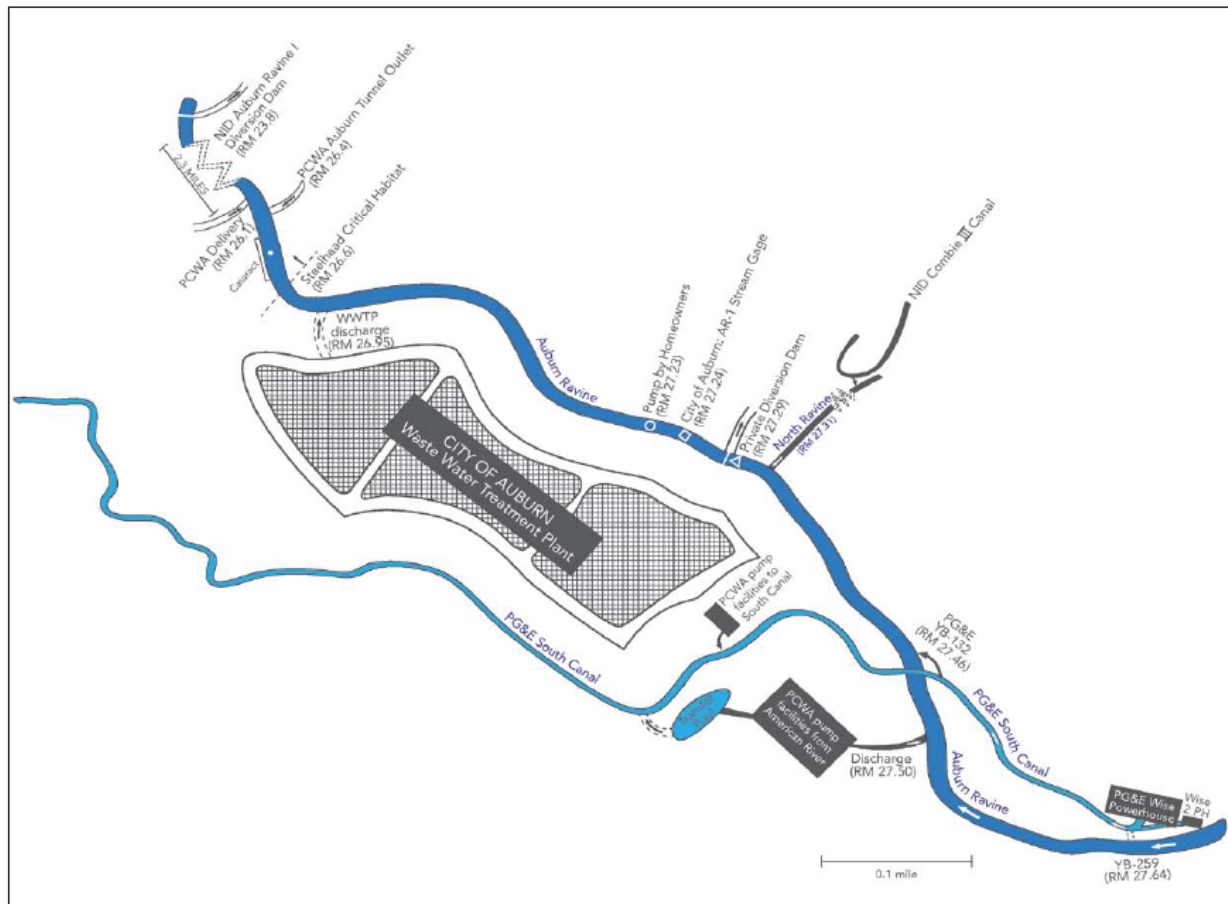


Figure C-1. Extent of Anadromy in Auburn Ravine

5. Critical Habitat

Critical habitat is designated by USFWS or NMFS and is defined as specific geographic areas that are characterized by features essential to the conservation of a federally threatened or endangered species and that may require special management and protection. Critical habitat may also include areas that are not currently occupied by the species but will be needed for its recovery.

Designated critical habitat for Sierra Nevada yellow-legged frog encompasses portions of the Proposed Upper Drum-Spaulding Project area (50 CFR Part 17). The following Proposed Upper Drum-Spaulding Project reservoirs are included in designated critical habitat subunit 2C (Black Buttes): Upper Rock Lake, Lower Rock Lake, and Lake Spaulding. No designated critical habitat for other listed fish or wildlife occurs in the Proposed Upper Drum-Spaulding Project area. USFWS considers that subunit 2C contains the physical or biological features essential to the conservation of the species, is currently functional habitat sustaining frogs, and is needed to protect core surviving populations and their unique genetic heritage. Within these areas, the primary constituent elements of the physical or biological features essential to the conservation of the Sierra Nevada yellow-legged frog consist of:

- Aquatic habitat for breeding and rearing--habitat that consists of permanent water bodies, or those that are either hydrologically connected with, or close to, permanent water bodies, including, but not limited to, lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), pools (such as a body of impounded water contained above a natural dam), and other forms of aquatic habitat;
- Aquatic nonbreeding habitat (including overwintering habitat)--this habitat may contain the same characteristics as aquatic breeding and rearing habitat (often at the same locale), and may include lakes, ponds, tarns, streams, rivers, creeks, plunge pools within intermittent creeks, seeps, and springs that may not hold water long enough for the species to complete its aquatic life cycle. This habitat provides for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult mountain yellow-legged frogs; and
- Upland areas adjacent to or surrounding breeding and nonbreeding aquatic habitat that provide area for feeding and movement by frogs.

In NMFS's five-year review³ of Central Valley steelhead, it concluded that the threatened Central Valley steelhead distinct population segment (DPS) included all naturally spawned populations of steelhead below natural and human-made barriers in the Sacramento and San Joaquin Rivers and tributaries. Auburn Ravine river mile 0.0 to 26.6 is classified as critical habitat for Central Valley steelhead. This is the only designated critical habitat in the Proposed Lower Drum Project area. Critical habitat for Central Valley steelhead contains physical habitat essential to the conservations of a species (PCEs). Within Auburn Ravine, biological features that are considered vital for

³ National Marine Fisheries Service (NMFS). 2016. *5-Year Status Review California Central Valley Recovery Domain, California Central Valley Steelhead DPS*. National Marine Fisheries Service West Coast Region.



Central Valley steelhead include habitat for adult and juvenile migration, spawning incubation, and juvenile rearing.

6. Fish and Wildlife Movement Corridors

Wildlife corridors refer to established migration routes commonly used by resident and migratory species for passage from one geographic location to another. Corridors are present in a variety of habitats and link otherwise fragmented acres of undisturbed area. Maintaining the continuity of established wildlife corridors is important to (1) sustain species with specific foraging requirements, (2) preserve a species' distribution potential, and (3) retain diversity among many wildlife populations. Therefore, resource agencies consider wildlife corridors to be a sensitive resource.

Most of the watershed basins associated with the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas have non-project-related, downstream dams that block the migration of anadromous fishes, although the dams associated with the Proposed Projects act as existing aquatic migration barriers to current fish populations. Canals and other facilities associated with the Proposed Projects may act as barriers to local and regional wildlife movement; however, wildlife crossings are present, and several P conditions are included in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project to increase permeability.

Anadromous fish have access to Auburn Ravine, a tributary of the Sacramento River. Auburn Ravine also provides critical habitat for Central Valley steelhead. Within the geographic scope of the Proposed Projects, critical habitat includes Auburn Ravine from river mile 0 to 26.6.

7. Special-status Species

Candidate, sensitive, or special-status species are commonly characterized as species that are at potential risk or actual risk to their persistence in a given area, or across their native habitat. These species have been identified and assigned a status ranking by governmental agencies such as CDFW, USFWS, NMFS, or private organizations such as CNPS. The degree to which a species is at risk of extinction is the determining factor in the assignment of a status ranking. Some common threats to a species' or population's persistence include habitat loss, degradation, and fragmentation, as well as human conflict and intrusion. For the purposes of this biological review, special-status species are defined as follows:

- listed, proposed, or candidates for listing under the federal Endangered Species Act (50 CFR 17.11 – listed; 61 *Federal Register* 7591, February 28, 1996,)

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- listed or proposed for listing under the California Endangered Species Act (CESA; FGC 1992 Section 2050 et seq.; 14 California Code of Regulations Section 670.1 et seq.)
- designated as a species of special concern by CDFW
- designated as fully protected by CDFW (FGC Sections 3511, 4700, 5050, 5515)
- species that meet the definition of rare or endangered under CEQA (14 California Code of Regulations Section 15380), including CNPS List Rank 1b and 2
- species designated as sensitive by the Forest Service for the Tahoe National Forest under the Forest Service Manual 2672.11, 2670.44–2670.5

The results of the USFWS, NMFS, CDFW, CNPS, and the Forest Service queries identified several special-status species with the potential be affected by activities. Tables in this appendix provide descriptions of the habitat requirements for each species and conclusions regarding the potential for each species to be affected by the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project. In cases where a determination was made that no suitable habitat for a given species was present, that species is not analyzed further in this document.

Results of the relicensing studies were reviewed to help inform the potential for special-status species to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas; however, the majority of these studies are over a decade old, making some of the findings and conclusions regarding the presence or absence of species outdated. Tables C-3 through C-6 summarize those species determined to have the potential to be affected by activities, and their associated CWHR habitat types as interpreted from the more detailed habitat requirements in the special-status species tables in this appendix.

The CWHR habitats listed in the tables are meant as a high-level reference to where these species could occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. The locations and extent of these habitats have not been ground-truthed and species could potentially use habitats other than those identified in Tables C-3 through C-6.



Table C-3. Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Allium jepsonii</i>	Jepson's onion	None	None	1B.2	Serpentine or volcanic soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 980–4,330 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Balsamorhiza macrolepis</i>	big-scale balsamroot	None	None	1B.2	Occasionally in serpentine soils in chaparral, cismontane woodland, and grassland. Elevation: 295–5,100 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Calystegia stebbinsii</i>	Stebbins' morning-glory	FE	SE	1B.1	Serpentine or gabbro soils in openings of chaparral and cismontane woodland. Elevation: 605–3,575 feet. Blooming period: April–July	Yes	Suitable habitat present.
<i>Calystegia vanzuukiae</i>	Van Zuuk's morning-glory	None	None	1B.3	Serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 1,640–3,870 feet. Blooming period: May–August	Yes	Suitable habitat present.

⁴ California Rare Plant Rank

⁵ All plant habitat descriptions derived from the California Native Plant Society Inventory of Rare and Endangered Plants of California (2020)

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Table C-3. Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Carex sheldonii</i>	Sheldon's sedge	None	None	2B.2	Mesic soils in lower montane coniferous forest, freshwater marshes and swamps, and riparian scrub. Elevation: 3,935–6,600 feet. Blooming period: May–August	No	Elevation of Proposed Projects is below species range.
<i>Carex xerophila</i>	chaparral sedge	None	None	1B.2	Serpentine and gabbro soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 1,440–2,525 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Ceanothus roderickii</i>	Pine Hill ceanothus	FE	SR	1B.1	Serpentine and gabbro soils in chaparral and cismontane woodland. Elevation: 800–3,575 feet. Blooming period: April–June	Yes	Suitable habitat present.
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	None	None	1B.2	Serpentine, gabbro, or other soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 800–5,545 feet. Blooming period: May–June	Yes	Suitable habitat present.



Table C-3. Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Chloropyron molle</i> ssp. <i>hispidum</i>	hispid bird's-beak	None	None	1B.1	Alkaline soils in meadows, seeps, playas, grassland. Elevation: 3–508 feet. Blooming period: June–September	No	Suitable habitat not present.
<i>Downingia pusilla</i>	dwarf downingia	None	None	2B.2	Vernal pools and mesic grassland. Elevation: 0–1,460 feet. Blooming period: March–May	No	Suitable habitat not present.
<i>Eryngium jepsonii</i>	Jepson's coyote thistle	None	None	1B.2	Clay soil in vernal pools and grassland. Elevation: 5–985 feet. Blooming period: April–August	No	Suitable habitat not present.
<i>Fremontoden dron decumbens</i>	Pine Hill flannelbush	FE	SR	1B.2	Rocky gabbro or serpentine soils in chaparral and cismontane woodland. Elevation: 1,390–2,495 feet. Blooming period: April–July	Yes	Suitable habitat present.
<i>Galium californicum</i> ssp. <i>sierrae</i>	El Dorado bedstraw	FE	SR	1B.2	Gabbro soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 325–1,920 feet. Blooming period: May–June	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Gratiola heterosepala</i>	Boggs Lake hedge-hyssop	None	SE	1B.2	Clay soils in vernal pools and lake margins of marshes and swamps. Elevation: 30–7,790 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Horkelia parryi</i>	Parry's horkelia	None	None	1B.2	lone formations and other soils in chaparral and cismontane woodland. Elevation: 260–3,510 feet. Blooming period: April–September	Yes	Suitable habitat present.
<i>Juncus digitatus</i>	finger rush	None	None	1B.1	Vernal pools with xeric conditions and openings in cismontane woodland and lower montane coniferous forest. Elevation: 2,165–2,590 feet. Blooming period: April–June	Yes	Suitable habitat present.
<i>Juncus leiospermus</i> var. <i>ahartii</i>	Ahart's dwarf rush	None	None	1B.2	Mesic soils in grassland. Elevation: 95–750 feet. Blooming period: March–May	Yes	Suitable habitat present.



Table C-3. Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Juncus leiospermus</i> var. <i>leiospermus</i>	Red Bluff dwarf rush	None	None	1B.1	Vernally mesic soils in chaparral, cismontane woodland, meadows, seeps, grassland, and vernal pools. Elevation: 110–4,100 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Legenere limosa</i>	legenere	None	None	1B.1	Vernal pools. Elevation: 0–2,885 feet. Blooming period: April–June	No	Suitable habitat not present in areas proposed for disturbance.
<i>Lewisia cantelovii</i>	Cantelow's lewisia	None	None	1B.2	Mesic and granitic soils and occasionally serpentine seeps in broadleaved upland and lower montane coniferous forests, chaparral, and cismontane woodland. Elevation: 1,080–4,495 feet. Blooming period: May–October	Yes	Suitable habitat present.

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Table C-3. Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Lycopodiella inundata</i>	inundated bog club-moss	None	None	2B.2	Coastal bogs and fens, mesic lower montane coniferous forest, and lake margins of swamps and marshes. Elevation: 15–3,280 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Monardella follettii</i>	Follett's monardella	None	None	1B.2	Rocky and serpentine soils in lower montane coniferous forest. Elevation: 1,965–6,560 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Navarretia myersii</i> ssp. <i>myersii</i>	pincushion navarretia	None	None	1B.1	Often acidic soils in vernal pools. Elevation: 65–1,085 feet. Blooming period: April–May	No	Suitable habitat not present.
<i>Orcuttia viscida</i>	Sacramento Orcutt grass	FE	SE	1B.1	Vernal pools. Elevation: 98–328 feet. Blooming period: April–July (September)	No	Suitable habitat not present. Elevation of Proposed Projects is above species range.



Table C-3. Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Packera layneae</i>	Layne's ragwort	FT	SR	1B.2	Rocky serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 655–3,560 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	None	None	1B.2	Cismontane woodland, lower montane coniferous forest, meadows, and seeps. Elevation: 2,000–6,595 feet. Blooming period: May–July	Yes	Suitable habitat present.
<i>Poa sierrae</i>	Sierra blue grass	None	None	1B.3	Openings in lower montane coniferous forest. Elevation: 1,195–4,920 feet. Blooming period: April–July	Yes	Suitable habitat present.
<i>Rhynchospora Rhynchospora capitellata</i>	brownish beaked-rush	None	None	2B.2	Mesic soils in meadows, seeps, marshes, swamps, and montane coniferous forests. Elevation: 145–6,560 feet. Blooming period: July–August	Yes	Suitable habitat present.
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	None	None	1B.2	Fresh water marshes and swamps that are typically shallow. Elevation: 0–2,132 feet. Blooming period: May–October	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Sidalcea stipularis</i>	Scadden Flat checkerbloom	None	SE	1B.1	Montane freshwater marshes and swamps. Elevation: 2,295–2,395 feet. Blooming period: July–August	No	Elevation of Proposed Projects is below species range.
<i>Streptanthus tortuosus</i> ssp. <i>truei</i>	True's mountain jewelflower	None	None	1B.1	Partially shaded on steep rocky slopes in lower montane coniferous forest. Elevation: 2,505–2,820 feet. Blooming period: June–July (September)	No	Elevation of Proposed Projects is below species range.
<i>Viburnum ellipticum</i>	oval-leaved viburnum	None	None	2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation: 705–4,595 feet. Blooming period: May–June	Yes	Suitable habitat present.
<i>Wolffia brasiliensis</i>	Brazilian watermeal	None	None	2B.3	Shallow freshwater marshes and swamps. Elevation: 65–330 feet. Blooming period: April and December	No	Elevation of Proposed Projects is above species range.



Table C-3. Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR ⁴	Habitat Characteristics ⁵	Impacts Analyzed?	Rationale
<i>Wyethia reticulata</i>	El Dorado County mule ears	None	None	1B.2	Clay or gabbro soils in chaparral, cismontane woodland, lower montane coniferous forest. Elevation: 605–2,065 feet. Blooming period: April–August	Yes	Suitable habitat present.

Species Status:

Federal (USFWS and NMFS)

FE = Endangered

FT = Threatened

FC = Federal Candidate Species

State (CDFW)

SE = Endangered

ST = Threatened

SR = Rare

CRPR: 1B = Plants Rare, Threatened, or Endangered in California and elsewhere; 2B = Plants Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension: None = Plants lacking any threat information, .1 = Seriously threatened in California (over 80 percent of occurrences threatened; high degree and immediacy of threat), .2 = Moderately threatened in California (20–80 percent of occurrences threatened; moderate degree and immediacy of threat), .3 = Not very threatened in California (<20 percent of occurrences threatened; low degree and immediacy of threat or no current threats known)

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Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Invertebrates</i>						
<i>Bombus occidentalis</i>	western bumble bee	—	SCE	Open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Bumble bees require flowering plants that provide adequate pollen throughout the colony's life cycle, which can vary based on elevation, but typically ranges between early February to late November. Typically nests underground in abandoned rodent burrows, such as old squirrel or other animal nests, and in open west-southwest slopes bordered by trees, although a few nests have been reported from above-ground locations such as in logs among railroad ties. Availability of nests sites may depend on rodent abundance (IUCN 2020).	Yes	Suitable habitat present.



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	—	Endemic to the grasslands of the Central Valley and the Central and South Coast Range mountains of California, and the Agate Desert of southern Oregon. Found only in cool water vernal pools and vernal pool-like habitats; does not occur in riverine, marine, or other permanent bodies of water (USFWS 2007).	No	Suitable habitat not present.
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT	—	Dependent on host plant, elderberry (<i>Sambucus</i> spp.), which most commonly grows in riparian woodlands, but also in some upland habitats such as oak savannas and annual grasslands. Current presumed range in Central Valley extends from Shasta County south to Fresno County, including the valley floor and lower foothills up to approximately 500 feet in elevation (USFWS 2017).	Yes	Suitable habitat below 500 feet.

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Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	FE	—	Found only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands. Patchily distributed across the Central Valley from Shasta County south to Tulare County with isolated occurrences in the East Bay Area (USFWS 2007).	No	Suitable habitat not present.



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Fish</i>						
<i>Entosphenus tridentatus</i>	Pacific lamprey	—	SSC	Cold, clear water for spawning and incubation. Peak spawning appears to be closely tied to water temperatures that are suitable for early development, but can occur at temperatures above 22°C. Adults use gravel areas to build nests, while ammocoetes need soft sediments in which to burrow during rearing. Nests are generally associated with cover, including gravel and cobble substrates, vegetation and woody debris. Ammocoetes burrow into larger substrates as they grow. Ammocoetes also need detritus that produces algae for food and habitats with slow or moderately slow water velocities, such as low gradient riffles, pool tailouts and lateral scour pools (CDFW 2015).	No	Outside known species range.

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Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Hypomesus transpacificus</i>	delta smelt	FT	SE	Endemic to open waters of San Francisco Bay and the Sacramento-San Joaquin River Delta. Distribution includes San Pablo Bay up through Suisun Bay, upstream through the Delta to the Sacramento River below Isleton, and the San Joaquin River below Mossdale. Spawning is thought to occur in sloughs and shallow edge-water channels in the upper Delta and in Montezuma Slough near Suisun Bay (USFWS 2010).	No	Outside of known species range.
<i>Lampetra ayresii</i>	western river lamprey	—	SSC	Occurs in the Sacramento-San Joaquin River systems, although it likely occurs elsewhere. Small lampreys that spend most of their lives in freshwater, with approximately three to four months in saltwater. Adults migrate into freshwater for spawning in autumn (Moyle 2002).	No	Outside known species range.



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus mykiss</i>	Steelhead – Central Valley DPS	FT	—	Includes naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from the Sacramento and San Joaquin Rivers and their tributaries; excludes such fish originating from San Francisco and San Pablo Bays and their tributaries. This DPS includes steelhead from two artificial propagation programs: Coleman National Fish Hatchery Program and Feather River Fish Hatchery Program. Spawning habitat = gravel-bottomed, fast-flowing, well-oxygenated rivers and streams. Non-spawning = estuarine, marine waters (NOAA 2019).	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus tshawytscha</i> ESU spring-run	Central Valley spring-run Chinook salmon	FT	ST	Currently found in the Sacramento-San Joaquin River Delta, the Sacramento River and its tributaries, including American, Yuba and Feather rivers, and Mill, Deer and Butte Creeks. Numbers of adults dependent on pool depth and volume, amount of cover, and proximity to gravel. Water temperatures greater than 27°C are lethal to adults (NMFS 2016).	No	Outside known species range.



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
Amphibians						
<i>Rana boylei</i>	foothill yellow-legged frog	—	ST, SSC	Ranges in the northern half of California except for the Central Valley, Modoc Plateau, and eastern side of the Sierra Nevada Mountains. Generally found in shallow flowing streams and rivers with at least cobble sized substrate. Breeding generally occurs at the margins of wide shallow channels with reduced flow variation near tributary confluences. Specifically, egg masses are placed in low flow locations on or under rocks with preferred substrates being boulders, cobbles, or gravel. Eggs have been found at depths to 87 centimeters in water velocities of 0-0.21 meters per second and at most 12.5 meters from shore. Maximum water temperature for breeding is 26°C and 9°C to 21.5°C is the preferred range. Tadpoles avoid areas below 13°C and prefer temperatures between 16.5°C and 22.2°C (Thomson et al. 2016).	Yes	Suitable habitat present. Known populations in the Bear River (CDFW 2020a).

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Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Rana draytonii</i>	California red-legged frog	FT	SSC	Ponds/streams in humid forests, woodlands, grasslands, coastal scrub, and streambanks with plant cover in lowlands or foothills. Breeding habitat includes permanent or ephemeral water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry. From sea level to 5,000 feet (1,525 meters). Occurs along the Coast Ranges from Mendocino County south to northern Baja California, and inland across the northernmost reaches of the Sacramento Valley and locally south through portions of the Sierra Nevada foothills as far south as northern Tulare County (Nafis 2020).	No	No known occurrences west of Interstate 80 with the exception of one near Bullard's Bar Reservoir ~20 miles north of Proposed Projects (CDFW 2020a).



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Rana muscosa</i>	southern mountain yellow-legged frog	FE	SE	Lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the southern Sierra Nevada Mountains. Rocky streams in narrow canyons and in the chaparral belt in the mountains of southern California. Found from 984 feet to above 12,000 feet (370–3,660 meters) in elevation (Nafis 2020).	No	Proposed Projects are outside of known species range (CDFW 2020a).
<i>Rana sierrae</i>	Sierra Nevada yellow-legged frog	FE	ST	Inhabits lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the Sierra Nevada mountains. Open stream and lake edges with a gentle slope up to a depth of 2–3 inches (5–8 centimeters) seem to be preferred. Waters that do not freeze to the bottom and which do not dry up are required. Known from 984–12,000 feet (298–3,626 meters) (Nafis 2020).	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Spea hammondi</i>	western spadefoot	—	SSC	Generally found in grasslands, oak woodlands, coastal sage scrub, and chaparral in washes, floodplains, alluvial fans, playas, and alkali flats. Natural and artificial water bodies are used for breeding. Specifically, vernal pools used by this species have an average ponding duration of 81 days, and successful recruitment occurs in ponds that last on average 21 days longer than larval development time. Pool temperature requirements are from 48 to 90°F. Pools with invasive species, such as crayfish (<i>Pacifasticus</i> spp.) or American bullfrogs (<i>Lithobates catesbeianus</i>), often, but not always, exclude this species (Thomson et al. 2016).	No	Suitable habitat not present.



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
Reptiles						
<i>Actinemys (Emys) marmorata</i>	northwestern (western) pond turtle	—	SSC	Ranges throughout California except for Inyo and Mono Counties. Generally occurs in various water bodies including permanent and ephemeral systems either natural or artificial. Upland habitat that is at least moderately undisturbed is required for nesting and overwintering, in soils that are loose enough for excavation (Thomson et al. 2016).	Yes	Suitable habitat present.
<i>Phrynosoma blainvilli</i>	Blainville's (coast) horned lizard	—	SSC	The species is known to occur in valley-foothill hardwood, riparian, and conifer habitats, and occasionally grasslands. They range from the Sierra Nevada foothills and throughout the central California coast. Individuals utilize loose soils for burrowing, forage in open areas or between shrubs, and do not require permanent water (CDFW 2020c).	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Thamnophis gigas</i>	giant garter snake	FT	ST	Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, rice fields and their associated uplands. Upland habitat should have burrows or other soil crevices suitable for snakes to reside during their dormancy period (November to mid-March). Ranges in the Central Valley from Butte County to Buena Vista Lake in Kern County (USFWS 2012).	No	Outside of existing species range (USFWS 2020).
Birds						



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Accipiter gentilis</i>	northern goshawk	—	SSC	Mature and old-growth forests including Ponderosa pine (<i>Pinus ponderosa</i>), Jeffrey pine (<i>Pinus jeffreyi</i>), Lodgepole pine (<i>Pinus contorta</i>), mixed conifer, Douglas-fir (<i>Pseudotsuga menziesii</i>), mixed Redwood-Douglas-fir hardwood, and quaking aspen (<i>Populus tremuloides</i>). Occurs in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mountains, in Mount Pinos and San Jacinto, San Bernardino, and White Mountains (Shuford and Gardali 2008).	Yes	Suitable habitat present.

Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Agelaius tricolor</i>	tricolored blackbird	—	ST, SSC	Preferred nesting habitat includes cattails and bulrushes (<i>Typha</i> spp.), Himalayan blackberry (<i>Rubus armeniacus</i>), and agricultural silage. Dense vegetation is preferred but heavily lodged cattails not burned in recent years may preclude settlement. Need access to open water. Strips of emergent vegetation along canals are avoided as nest sites unless they are approximately 10 or more meters wide but, in some ponds, especially where associated with Himalayan blackberries and deep water, settlement may be in narrower fetches of cattails (Hamilton 2004). Mostly a year-round resident in California. Common locally throughout Central Valley and in coastal districts from Sonoma County south. Breeds locally in northeastern California. In winter, becomes more widespread along central coast and San Francisco Bay area, and can be found in portions of the Colorado Desert (CDFW 2020c).	Yes	Suitable habitat present.



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Ammodramus savannarum</i>	grasshopper sparrow	—	SSC	Known to breed in grassland habitats throughout the northeastern and mid-Atlantic U.S., southeastern Canada, coastal and Central Valley of California, and a few other areas of Canada and northern Mexico (Shuford and Gardali 2008). In the east and midwest, tallgrass and mixed grass prairie is preferred, whereas in the west and southwest the species typically uses shortgrass and semidesert grasslands. Additionally, individuals can sometimes be found in corn (<i>Zea mays</i>) and oat (<i>Avena sativa</i>) fields and avoid areas with high shrub cover (Shuford and Gardali 2008).	Yes	Suitable habitat present.

Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Athene cunicularia</i>	burrowing owl	—	SSC	Species known to be a yearlong resident of open, dry grasslands and varying desert habitats (CDFW 2020). Nesting habitat includes open areas with mammal burrows, including rolling hills, grasslands, fallow fields, sparsely vegetated desert scrub, vacant lots and human disturbed lands. Soils must be friable for burrows (Bates 2006).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range of species and all occurrences are much lower in elevation than the Proposed Projects (CDFW 2020a).



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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aquila chrysaetos</i>	golden eagle	BGEPA	FP	Habitat includes rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops. Uncommon resident in hills and mountains throughout California, and an uncommon migrant and winter resident in the Central Valley and Mojave Desert (CDFW 2020c).	Yes	Suitable habitat present.
<i>Aythya americana</i>	redhead	—	SSC	Usually nest in freshwater emergent wetlands where dense stands of cattails (<i>Typha</i> spp.) and tules (<i>Schoenoplectus</i> spp.) are interspersed with areas of deep, open water. Also observed nesting in somewhat alkaline marshes and potholes (Shuford and Gardali 2008).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range ⁶ of species (CDFW 2020a).

⁶ Only nesting redhead are protected (CDFW 2020d)

Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Buteo swainsoni</i>	Swainson's hawk	—	ST	Nests in stands with few trees in riparian areas, juniper-sage flats, and oak savannah. Forages in adjacent grasslands, agricultural fields and pastures. Breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen Co., and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, and Antelope Valley (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range of species (CDFW 2020a). Impacts to non-nesting hawks are not anticipated.



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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Chlidonias niger</i>	black tern	—	SSC	Uses fresh emergent wetlands, lakes, ponds, moist grasslands, and agricultural fields. In migration, some take coastal routes and forage offshore (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range ⁷ of species (CDFW 2020a).

⁷ Only nesting colonies are protected (CDFW 2020d)

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Circus hudsonius</i>	northern harrier	—	SSC	Nest on the ground in patches of dense, tall vegetation in undisturbed areas. Breed and forage in variety of open habitats such as marshes, wet meadows, weedy borders of lakes, rivers and streams, grasslands, pastures, croplands, sagebrush flats and desert sinks (Shuford and Gardali 2008).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range ⁸ of species (CDFW 2020a).
<i>Contopus cooperi</i>	olive-sided flycatcher	—	SSC	Nests in a wide variety of forest and woodland habitats below 9,000 feet in the coastal and mountainous portions of the state (occurs only as a migrant elsewhere). Prefers forests and woodlands with adjacent meadows, lakes or open terrain for foraging (CDFW 2020c).	Yes	Suitable habitat present.

⁸ Only nesting northern harriers are protected (CDFW 2020d)



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Cypseloides niger</i>	black swift	—	SSC	Breeding sites are very specific: behind or beside permanent or semipermanent waterfalls, on perpendicular cliffs near water and in sea caves. Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mountains, and in coastal bluffs and mountains from San mateo County south to San Luis Obispo County (Shuford and Gardali 2008).	No	Suitable habitat not present.
<i>Elanus leucurus</i>	white-tailed kite	—	FP	Occurs in herbaceous and open stages of valley lowland habitats, usually near agricultural land. Forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands (CDFW 2020). Typically nest in the upper third of trees that may be 10–160 feet (33–525 meters) tall. These can be open-country trees growing in isolation, or at the edge of or within a forest (Cornell 2019).	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Empidonax traillii</i>	willow flycatcher	—	SE	Summer resident in wet meadows and montane riparian habitats from 2,000–8,000 feet elevation in the Sierra Nevada and Cascade Ranges. Most often found in open river valleys or large mountain meadows with lush shrubby willows. Has been observed breeding along the Santa Ynez River in Santa Barbara County, and along the Santa Clara River in Ventura County (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range of species (CDFW 2020a). Impacts to non-nesting birds are not anticipated.
<i>Falco peregrinus</i>	American peregrine falcon	—	FP	Breeds near wetlands lakes, rivers, or other waters on cliffs, banks, dunes or mounds, mostly in woodland, forest and coastal habitats. Nest is a scrape on a depression or ledge in an open site. May use human-made structures, snags, or trees for nesting (CDFW 2020c).	Yes	Suitable habitat present.



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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Haliaeetus leucocephalus</i>	bald eagle	BGEPA	SE, FP	Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Requires large bodies of water or rivers with abundant fish, and adjacent snags. Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. About half of the wintering population is in the Klamath Basin (CDFW 2020c).	Yes	Suitable habitat present.
<i>Icteria virens</i>	yellow breasted chat	None	SSC	Nest in early-successional riparian habitats with a well-developed shrub layer and an open canopy. Restricted to narrow border of streams, creeks, sloughs and rivers. Often nest in dense thicket plants such as blackberry and willow (Shuford and Gardali 2008).	Yes	Suitable habitat present.
<i>Lanius ludovicianus</i>	loggerhead shrike	—	SSC	Breed in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground (Shuford and Gardali 2008).	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Laterallus jamaicensis coturniculus</i>	California black rail	—	ST, FP	Saline, brackish, and fresh emergent wetlands. Scarce, but true abundance difficult to determine due to small size and extremely secretive nature. Known to nest at scattered locations in the San Francisco Bay Area and Delta region, Point Reyes National Seashore, San Luis Obispo and Orange Counties, as well as the Imperial and Lower Colorado River Valleys. Appears intermittently and sparingly at a few locations in the Sacramento Valley (CDFW 2020c).	Yes	Suitable habitat present.
<i>Melospiza melodia</i>	song sparrow (Modesto pop.)	—	SSC	Often found in emergent freshwater marshes dominated by tules (<i>Scirpus</i> spp.) and cattails (<i>Typha</i> spp.) as well as riparian willow (<i>Salix</i> spp.). Also nest in riparian forests of Valley oak (<i>Quercus lobata</i>) with a sufficient understory of blackberry (<i>Rubus</i> spp.), along vegetated irrigation canals and levees, and in recently planted Valley oak restoration sites. They are found throughout the Sacramento Valley, from the Delta north to Chico (Shuford and Gardali 2008).	Yes	Suitable habitat present.



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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Pelecanus erythrorhynchos</i>	American white pelican	—	SSC	In California, nests only in large lakes in Klamath Basin. Roosts along water edges, beaches, sandbars, or old driftwood (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but outside nesting range ⁹ of species (CDFW 2020a).

⁹ Only nesting colonies protected (CDFW 2020d)

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Progne subis</i>	purple martin	—	SSC	Inhabits open forests, woodlands, and riparian areas in breeding season. Found in a variety of open habitats during migration, including grassland, wet meadow, and fresh emergent wetland, usually near water. In southern California, now only a rare and local breeder on the coast and in interior mountain ranges, with few breeding localities. Absent from higher desert regions except as a rare migrant. In northern California, an uncommon to rare local breeder on the coast and inland to Modoc and Lassen Counties (Zeiner et al. 1988, 1989, 1990).	Yes	Suitable habitat present.



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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Riparia</i>	bank swallow	—	ST	Riparian, lacustrine, and coastal areas with vertical banks, bluffs or cliffs with fine-textured or sandy soils, into which it digs nesting holes. Also nests in earthen banks as well as sand and gravel pits (CDFW 2020). Species primarily found on the Feather and Sacramento Rivers in California (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but outside nesting range of species (CDFW 2020a). Impacts on non-nesting birds not anticipated.
<i>Setophaga petechia</i>	yellow warbler	—	SSC	Usually found in riparian deciduous habitats in summer: cottonwoods (<i>Populus</i> spp.), willows (<i>Salix</i> spp.), alders (<i>Alnus</i> spp.), and other small trees and shrubs typical of low, open-canopy riparian woodland. Also breeds in montane shrubbery in open conifer forests (CDFW 2020c).	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Strix nebulosa</i>	great gray owl	—	SE	Breeds in red fir, mixed conifer, or lodgepole pine habitats, always near wet meadows. Nests in large, broken-topped snags usually 25–72 feet (8–23 meters) above the ground. Elevation range is 4,500–7,500 feet (1,400 to 2,300 meters) in the Sierra Nevada from the vicinity of Quincy, Plumas Counties south to the Yosemite region (CDFW 2020c).	No	Proposed Projects are entirely below elevation range of the species.
<i>Strix occidentalis</i>	California spotted owl	—	SSC	Older forests in areas of high canopy cover, with a multi-layered canopy, old decadent trees, a high number of large trees, and coarse downed woody debris. In California, ranges throughout the west slopes of the Sierra Nevada Mountains, and down the Coast Range Mountains from Carmel south through the Transverse Ranges nearly to Baja California (Shuford and Gardali 2008).	Yes	Suitable habitat present.



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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	—	SSC	Nest in marshes with tall, emergent vegetation (e.g., tules and cattails) adjacent to deep water (Shuford and Gardali 2008).	No	Species has potential to occur in migration or nonbreeding season, but outside nesting range ¹⁰ of species (CDFW 2020a).
Mammals						
<i>Antrozous pallidus</i>	pallid bat	—	SSC	Ranges across nearly all of California except for high elevation portions of the Sierra Nevada Mountains and Del Norte, western Siskiyou, Humboldt, and northern Mendocino Counties. Generally found in a wide variety of habitats but with some preference for drier areas. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings (CDFW 2020c).	Yes	Suitable habitat present.

¹⁰ Only nesting yellow-headed blackbirds protected (CDFW 2020d)

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aplodontia rufa californica</i>	Sierra Nevada mountain beaver	—	SSC	Ranges in the Cascade, Klamath, and Sierra Nevada Mountains. Generally found in dense riparian forests and open shrubscapes around most forests. Specifically found with open to moderate canopy cover with a dense understory near water. This species requires deep friable soils and a cool moist microclimate (CDFW 2020c).	Yes	Suitable habitat present.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	—	SSC	Ranges throughout California except for high elevation portions of the Sierra Nevada Mountains. Generally prefers mesic habitats but known to occur in all non-alpine habitats of California. Roosting occurs in caves, tunnels, mines, buildings, or other structures and this species may use different roosting sites for day and night (CDFW 2020c).	Yes	Suitable habitat present.



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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Euderma maculatum</i>	spotted bat	—	SSC	Ranges along the eastern half of California as well as all of southern California except for Orange County and southern Los Angeles County. Generally occurs in desert, mixed conifer, and grassland habitats. Specifically, this species prefers to roost in rock crevices on cliffs but will sometimes use caves and buildings (CDFW 2020c).	Yes	Suitable habitat present.
<i>Lasiurus blossevillii</i>	western red bat	—	SSC	Ranges in the western half of California except for Del Norte and Humboldt Counties. Generally occurs in most habitats except for the desert. Roosts in trees, sometimes shrubs, and typically at the margins of habitats (CDFW 2020c).	Yes	Suitable habitat present.
<i>Pekania pennanti</i>	fisher	—	SSC	Large areas of mature, dense forest stands with snags and greater than 50% canopy closure. Uncommon permanent resident of the Sierra Nevada, Cascades, and Klamath Mountains; also found in a few areas in the North Coast Ranges (USFWS 2014).	Yes	Suitable habitat present.

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Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Taxidea taxus</i>	American badger	—	SSC	Ranges in all of California except the extreme northwest corner. Generally found in drier open areas of habitats with friable soils (CDFW 2020c).	Yes	Suitable habitat present.
<i>Vulpes macrotis</i>	San Joaquin kit fox	FE	ST	Occur in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure. Areas having open, level, sandy ground (USFWS 2010).	No	Suitable habitat not present and Proposed Projects are outside of known species range (CDFW 2020a).



Table C-4. Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Vulpes necator</i>	Sierra Nevada red fox	FC	ST	Found in a variety of habitats, including alpine dwarf-shrub, wet meadow, subalpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer, Jeffrey pine, eastside pine, montane hardwood-conifer, and ponderosa pine. Most sightings above 7,000 feet (2,134 meters), ranging from 3,900–11,900 feet (1,189–3,627 meters). Dens in rocky outcrops, hollow logs and stumps, and burrows in friable soil (CDFW 2020c).	Yes	Suitable habitat present.

Source: California Department of Fish and Wildlife., November 2018., Special Animals List., <https://www.wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>, CDFW Biogeographic Data Branch., Sacramento.

Species Status:

Federal (USFWS and NMFS)

BGEPA =Bald and Golden Eagle Protection Act

FE = Endangered

FT = Threatened

FCE = Candidate Endangered

FCT = Candidate Threatened

Appendix C Biological Resources Information
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FCD = Candidate for delisting

State (CDFW)

SE = Endangered

ST = Threatened

SCE = Candidate Endangered

SCT = Candidate Threatened

SCD = Candidate for delisting

FP = Fully Protected

SSC = Species of Special Concern



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Arabis rigidissima</i> var. <i>demota</i>	Galena Creek rockcress	—	—	FSS	1B.2	Rocky soil in broadleaf upland and upper montane coniferous forests. Elevation: 7,395–8,400 feet. Blooming period: July–August	Yes	Suitable habitat present.
<i>Artemisia tripartita</i> ssp. <i>tripartita</i>	threetip sagebrush	—	—	—	2B.3	Rocky and volcanic soils in openings of upper montane coniferous forest. Elevation: 7,215–8,530 feet. Blooming period: August	Yes	Suitable habitat present.

¹¹ California Rare Plant Rank

¹² All plant habitat descriptions derived from the California Native Plant Society Inventory of Rare and Endangered Plants of California (2020)

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PG&E's Upper Drum-SpaULDing Hydroelectric Project (FERC No. 2310)
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Table C-5. Special-status Species Proposed Upper Drum-SpaULDing Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Asplenium viride</i>	green spleenwort	—	—	—	2B.3	Rocky, granitic, or carbonate soils in subalpine coniferous scrub. Elevation: 6,725 feet. Blooming period: June–August	Yes	Suitable habitat present.
<i>Astragalus austinae</i>	Austin's astragalus	—	—	—	1B.3	Rocky soil in subalpine coniferous forest and alpine boulder and rock fields. Elevation: 8,005–9,745 feet. Blooming period (May) July–September	No	This species elevation range is more than 200 feet outside elevation range of Proposed Projects.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Astragalus lemmonii</i>	Lemmon's milk-vetch	—	—	FSS	1B.2	Great Basin scrub, meadows, seeps, and the lake shores of marshes and swamps. Elevation: 3,300–7,220 feet. Blooming period: May–September	Yes	Suitable habitat present.
<i>Astragalus pulsiferae</i> var. <i>coronensis</i>	Modoc Plateau milk-vetch	—	—	FSS	4.2	Sandy, gravelly, or volcanic soils in Great Basin scrub, lower montane coniferous forest, and pinyon and juniper woodland. Elevation: 4,400–6,200 feet. Blooming period: May–July	Yes	Suitable habitat present.

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PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Astragalus webberi</i>	Webber's milk-vetch	—	—	FSS	1B.2	Meadows, seeps, and broadleaved and lower montane coniferous forests. Elevation: 2,400–4,100 feet. Blooming period: May–July	Yes	Suitable habitat present.
<i>Boletus pulcherrimus</i>	red-pored bolete	—	—	FSS	—	Mixed hardwood and conifer woodlands. Elevation range: Below 8,500 feet. Sporing period: November–February (MykoWeb 2020).	No	Species primarily known in coastal forests north of San Francisco.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Botrychium ascendens</i>	upswept moonwort	—	—	FSS	2B.3	Mesic soil in meadows, seeps, and lower montane coniferous forest. Elevation: 3,655–8,860 feet. Sporing period: July–August	Yes	Suitable habitat present.
<i>Botrychium crenulatum</i>	scalloped moonwort	—	—	FSS	2B.2	Bogs, fens, meadows, seeps, marshes, freshwater swamps, montane coniferous forests. Elevation: 4,159–10,758 feet. Sporing period: June–September	Yes	Species was found in Proposed Projects.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Botrychium lunaria</i>	common moonwort	—	—	FSS	2B.3	Meadows, seeps, upper montane and subalpine coniferous forest. Elevation: 6,495–11,155 feet. Sporing period: August	Yes	Suitable habitat present.
<i>Botrychium minganense</i>	Mingan moonwort	—	—	FSS	2B.2	Mesic soils in bogs, fens, lower and upper montane coniferous forest. Elevation: 4,773–7,152 feet. Sporing period: July–September	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Botrychium montanum</i>	western goblin	—	—	FSS	2B.1	Mesic soil in meadows, seeps, and montane coniferous forest. Elevation: 4,805–7,150 feet. Sporing period: July–September	Yes	Suitable habitat present.
<i>Brasenia schreberi</i>	watershield	—	—	—	2B.3	Freshwater marshes and swamps. Elevation: 95–7,220 feet. Blooming period: June–September	Yes	Suitable habitat present.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Bruchia bolanderi</i>	moss	—	—	FSS	4.2	Damp soil in meadows, seeps, and montane coniferous forests. Elevation: 5,575–9,185 feet.	Yes	Suitable habitat present.
<i>Calystegia stebbinsii</i>	Stebbins' morning-glory	FE	SE	—	1B.1	Serpentine or gabbro soils in openings of chaparral and cismontane woodland. Elevation: 605–3,575 feet. Blooming period: April–July	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Calystegia vanzuukiae</i>	Van Zuuk's morning-glory	—	—	—	1B.3	Serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 1,640–3,870 feet. Blooming period: May–August	Yes	Suitable habitat present.
<i>Carex davyi</i>	Davy's sedge	—	—	—	1B.3	Upper and subalpine coniferous forests. Elevation: 4,920–10,500 feet. Blooming period: May–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulling Hydroelectric Project (FERC No. 2310)
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Table C-5. Special-status Species Proposed Upper Drum-Spaulling Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Carex lasiocarpa</i>	woolly-fruited sedge	—	—	—	2B.3	Bogs, fens, freshwater marshes and swamps, and lake margins. Elevation: 5,575–6,890 feet. Blooming period: June–July	Yes	Suitable habitat present.
<i>Carex limosa</i>	mud sedge	—	—	—	2B.2	Bogs, fens, meadows, seeps, marshes, swamps, and montane coniferous forests. Elevation: 3,935–8,860 feet. Blooming period: June–August	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Carex sheldonii</i>	Sheldon's sedge	—	—	—	2B.2	Mesic soils in lower montane coniferous forest, freshwater marshes and swamps, and riparian scrub. Elevation: 3,935–6,600 feet. Blooming period: May–August	Yes	Suitable habitat present.
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	—	—	—	1B.2	Serpentine, gabbro, or other soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 800–5,545 feet. Blooming period: May–June	Yes	Suitable habitat present.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Claytonia megarhiza</i>	fell-fields claytonia	—	—	—	2B.3	In rock crevices of subalpine coniferous forest and alpine boulder and rock fields. Elevation: 8,530–11,590 feet. Blooming period: July–September	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.
<i>Corallorhiza trifida</i>	northern coralroot	—	—	—	2B.1	Mesic soils in lower montane coniferous forest and the edges of meadows and seeps. Elevation: 4,490–5,725 feet. Blooming period: June–July	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Crepis runcinata</i>	fiddleleaf hawksbeard	—	—	—	2B.2	Mesic or alkaline soils in Mojavean desert scrub and pinyon and juniper woodland. Elevation: 4,100–6,480 feet. Blooming period: May–August	No	Habitat for this species is not present.
<i>Cypripedium fasciculatum</i>	clustered lady's slipper	—	—	FSS	4.2	Serpentine seeps and streambanks in lower montane and north coast coniferous forest. Elevation: 325–7,990 feet. Blooming period: March–August	Yes	Suitable habitat present.

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PG&E's Upper Drum-Spaulling Hydroelectric Project (FERC No. 2310)
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Table C-5. Special-status Species Proposed Upper Drum-Spaulling Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Cypripedium montanum</i>	mountain lady's slipper	—	—	FSS	4.2	Cismontane woodland, broadleaved, lower montane and north coast coniferous forests. Elevation: 605–7,300 feet. Blooming period: March–August	No	Species is not known from Vicinity of Proposed Projects.
<i>Dendrocollybia racemosa</i>	branched collybia	—	—	FSS	—	Mixed hardwood-conifer woodlands. Elevation: Unknown. Sporing period: November–February (MykoWeb 2020).	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Drosera anglica</i>	English sundew	—	—	—	2B.3	Bogs, fens, meadows, and seeps. Elevation: 4,265–7,400 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Erigeron miser</i>	starved daisy	—	—	FSS	1B.3	Upper montane coniferous forest. Elevation: 6,035–8,595 feet. Blooming period: June–October	Yes	Suitable habitat present.

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and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Eriogonum umbellatum</i> var. <i>torreyanum</i>	Donner Pass buckwheat	—	—	FSS	1B.2	Rocky and volcanic soils in meadows, seeps, and upper montane coniferous forest. Elevation: 6,085–8,595 feet. Blooming period: July–September	Yes	Suitable habitat present.
<i>Eryngium jepsonii</i>	Jepson's coyote thistle	—	—	—	1B.2	Clay soil in vernal pools and grassland. Elevation: 5–985 feet. Blooming period: April–August	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Fritillaria eastwoodiae</i>	Butte County fritillary	—	—	FSS	3.2	Sometimes serpentine soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 160–4,920 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Helodium blandowii</i>	Blandow's bog moss	—	—	FSS	2B.3	Damp soil in meadows, seeps, and subalpine coniferous forest. Elevation: 6,105–8,860 feet.	Yes	Suitable habitat present.

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PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Ivesia aperta</i> var. <i>aperta</i>	Sierra Valley ivesia	—	—	FSS	1B.2	Vernally mesic soils that are usually volcanic in Great Basin scrub, lower montane coniferous forest, meadows, seeps, vernal pools, and pinyon and juniper woodland. Elevation: 4,855–7,545 feet. Blooming period: June–September	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Ivesia aperta</i> var. <i>canina</i>	Dog Valley ivesia	—	—	FSS	1B.1	Volcanic and rocky soils in openings of lower montane coniferous forest and xeric conditions of meadows and seeps. Elevation: 5,245–6,560 feet. Blooming period: June–August	Yes	Suitable habitat present.

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PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Ivesia sericoleuca</i>	Plumas ivesia	—	—	FSS	1B.2	Vernally mesic soils that are usually volcanic in Great Basin scrub, vernal pools, meadows seeps, and lower montane coniferous forest. Elevation: 4,295–7,220 feet. Blooming period: May–October	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Ivesia webberi</i>	Webber's ivesia	—	—	FSS	1B.1	Sandy or gravelly soils in volcanic ashy Great Basin scrub, lower montane coniferous forest, and pinyon and juniper woodland. Elevation: 3,280–6,810 feet. Blooming period: May–July	Yes	Suitable habitat present.

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 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Juncus luciensis</i>	Santa Lucia dwarf rush	—	—	FSS	1B.2	Chaparral, Great Basin scrub, lower montane coniferous forest, meadows and seeps, and vernal pools. Elevation: 984–6,693 feet. Blooming period: April–July	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Lewisia cantelovii</i>	Cantelow's lewisia	—	—	FSS	1B.2	Mesic and granitic soils and occasionally serpentine seeps in broadleaved upland and lower montane coniferous forests, chaparral, and cismontane woodland. Elevation: 1,080–4,495 feet. Blooming period: May–October	Yes	Suitable habitat present.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Lewisia kelloggii</i> ssp. <i>hutchison</i>	Hutchison's lewisia	—	—	FSS	3.2	Often in slate soils or sometimes rhyolite tuff in openings and ridgetops of upper montane coniferous forest. Elevation: 2,505–7,760 feet. Blooming period: April–August	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Lewisia kelloggii</i> ssp. <i>kelloggii</i>	Kellog's lewisia	—	—	FSS	3.2	Often in slate soils or sometimes rhyolite tuff in openings and ridgetops of upper montane coniferous forest. Elevation: 4,805–7,760 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Lewisia longipetala</i>	long-petaled lewisia	—	—	FSS	1B.3	Granitic soils in mesic subalpine coniferous forests and alpine boulder and rock fields. Elevation: 8,200–9,595 feet. Blooming period: July–September	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Lewisia serrata</i>	saw-toothed lewisia	—	—	FSS	1B.1	Mesic soils and rocky slopes in broadleaved upland, riparian, and lower montane coniferous forests. Elevation: 2,525–4,710 feet. Blooming period: May–June	Yes	Suitable habitat present.
<i>Lycopodiella inundata</i>	inundated bog club-moss	—	—	—	2B.2	Coastal bogs and fens, mesic lower montane coniferous forest, and lake margins of swamps and marshes. Elevation: 15–3,280 feet. Sporing period: June–September	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Meesia longiseta</i>	long seta hump moss	—	—	—	2B.3	Carbonate soils in bogs, fens, meadows, seeps, and upper montane coniferous forest. Elevation: 5,740–9,990 feet. Sporing period: unknown	Yes	Suitable habitat present.
<i>Meesia uliginosa</i>	broad-nerved hump moss	—	—	FSS	2B.2	Damp soil in bogs, fens, meadows seeps, and upper montane and subalpine coniferous forests. Elevation: 3,965–9,200 feet. Sporing period: July and October	Yes	Suitable habitat present.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Mertensia oblongifolia</i> var. <i>oblongifolia</i>	sagebrush bluebells	—	—	—	2B.2	Usually mesic soils in Great Basin scrub, meadows, seeps, and lower montane and subalpine coniferous forests. Elevation: 3,280–9,845 feet. Blooming period: April–July	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Mielichhoferia elongata</i>	elongate copper moss	—	—	FSS	4.3	Metamorphic rock and carbonate soils, often along roadsides, that are usually vernal mesic and acidic in chaparral, meadows, seeps, coastal scrub, cismontane woodland, and broadleafed upland and lower montane and subalpine coniferous forests. Elevation: 0–6,430 feet. Sporing period: unknown	Yes	Suitable habitat present.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Monardella follettii</i>	Follett's monardella	—	—	FSS	1B.2	Rocky and serpentine soils in lower montane coniferous forest. Elevation: 1,965–6,560 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Nardia hiroshii</i>	Hiroshi's flapwort	—	—	—	2B.3	Damp soil with granitic bedrock. Meadows and seeps. Elevation range: Unknown. Sporing period: Unknown	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Oreostemma elatum</i>	tall alpine-aster	—	—	FSS	1B.2	Mesic soils in bogs, fens, meadows, seeps, and upper montane coniferous forest. Elevation: 3,295–6,890 feet. Blooming period: June–August	Yes	Suitable habitat present.
<i>Packera indecora</i>	rayless mountain ragwort	—	—	—	2B.2	Meadows and seeps. Elevation: 5,245–6,560 feet. Blooming period: July–August	Yes	Suitable habitat present.

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Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Packera layneae</i>	Layne's ragwort	FT	SR	—	1B.2	Rocky serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 655–3,560 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Peltigera gowardii</i>	veined water lichen	—	—	FSS	4.2	On rocks in cold water creeks with little to no sediment or disturbance in riparian forests. Elevation: 3,490–8,595 feet.	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Penstemon personatus</i>	closed-throated beardtongue	—	—	FSS	1B.2	Metavolcanic soils in chaparral and montane coniferous forests. Elevation: 3,490–6,955 feet. Blooming period: June–October	Yes	Suitable habitat present.
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	—	—	FSS	1B.2	Cismontane woodland, lower montane coniferous forest, meadows and seeps. Elevation: 2,000–6,595 feet. Blooming period: May–July	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Phaeocollybia olivacea</i>	olive phaeocollybia	—	—	FSS	—	In mixed oak or pine forests primarily in coastal lowlands but also known inland. Elevation: Unknown. Sporing period: September–November (Norvell 1998).	Yes	Suitable habitat present.
<i>Pinus albicaulis</i>	whitebark pine	FC	—	FSS	—	Subalpine forests. Elevation: 6,560–12,140 feet. Cone production: July–September (Jepson Flora Project 2019).	Yes	Species was found in Proposed Projects.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Poa sierrae</i>	Sierra blue grass	—	—	FSS	1B.3	Openings in lower montane coniferous forest. Elevation: 1,195–4,920 feet. Blooming period: April–July	Yes	Species was found in Proposed Projects.
<i>Potamogeton praelongus</i>	white-stemmed pondweed	—	—	—	2B.3	Deep water lakes associated with marshes and swamps. Elevation: 5,905–9,845 feet. July–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Potamogeton robbinsii</i>	Robbins' pondweed	—	—	—	2B.3	Deep water lakes associated with marshes and swamps. Elevation: 5,015–10,825 feet. July–August	Yes	Suitable habitat present.
<i>Pyrrocoma lucida</i>	sticky pyrrocoma	—	—	FSS	1B.2	Alkaline clay soils in Great Basin scrub, lower montane coniferous forest, meadows, and seeps. Elevation: 2,295–6,400 feet. Blooming period: July–October	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Rhamnus alnifolia</i>	alder buckthorn	—	—	—	2B.2	Meadows, seeps, and montane coniferous forest. Elevation: 4,490–6,990 feet. Blooming period: May–July	Yes	Suitable habitat present.
<i>Rhynchospora alba</i>	white beaked-rush	—	—	—	2B.2	Bogs, fens, meadows, seeps, and freshwater marshes and swamps. Elevation: 195–6,695 feet. Blooming period: June–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Rhynchospora capitellata</i>	brownish beaked-rush	—	—	—	2B.2	Mesic soils in meadows, seeps, marshes, swamps, and montane coniferous forests. Elevation: 145–6,560 feet. Blooming period: July–August	Yes	Suitable habitat present.
<i>Schoenoplectus Schoeno-plectus subterminalis</i>	water bulrush	—	—	—	2B.3	Bogs, fens, and the montane lake margins of marshes and swamps. Elevation: 2,460–7,380 feet. Blooming period: June–September	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Sidalcea stipularis</i>	Scadden Flat checkerbloom	—	SE	—	1B.1	Montane freshwater marshes and swamps. Elevation: 2,295–2,395 feet. Blooming period: July–August	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.
<i>Sphaeralcea munroana</i>	Munro's desert mallow	—	—	—	2B.2	Great Basin scrub. Elevation: 6,560 feet. Blooming period: May–June	No	Habitat for this species is not present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Streptanthus tortuosus</i> ssp. <i>truei</i>	True's mountain jewelflower	—	—	—	1B.1	Partially shaded on steep rocky slopes in lower montane coniferous forest. Elevation: 2,505–2,820 feet. Blooming period: June–July (September)	Yes	Suitable habitat present.
<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	slender-leaved pondweed	—	—	—	2B.2	Shallow freshwater marshes and swamps. Elevation: 980–7,055 feet. Blooming period: May–July	Yes	Suitable habitat present.



Table C-5. Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR ¹¹	Habitat Characteristics ¹²	Impacts Analyzed	Rationale
<i>Tauschia howellii</i>	Howell's tauschia	—	—	FSS	1B.3	Granitic and gravelly soils in upper montane and subalpine coniferous forests. Elevation: 5,590–8,200 feet. Blooming period: June–August	Yes	Suitable habitat present.

Species Status:

Federal (USFWS and USFS): FE = Endangered, FT = Threatened, FC = Federal Candidate Species, FSS = Forest Service Sensitive, WL = Watch List

State (CDFW): SE = Endangered, ST = Threatened, SR = Rare

CRPR: 1A = Plants presumed extirpated in California and either rare or extinct elsewhere, 1B = Plants Rare, Threatened, or Endangered in California and elsewhere, 2A = Plants Presumed extirpated in California, but more common elsewhere, 2B = Plants Rare, Threatened, or Endangered in California, but more common elsewhere, 3 = Plants about which we need more information – review list, 4 = Plants of limited distribution – watch list

CRPR Threat Code Extension: None = Plants lacking any threat information, .1 = Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat), .2 = Moderately threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat), .3 = Not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Invertebrates</i>							
<i>Anodonta californiensis</i>	California floater (freshwater mussel)	—	—	FSS	Species known to occur in low elevation slow moving rivers and lakes with muddy or sandy substrates. Reproduction of mussels relies on host fish. Host species include but are not limited to: Hardhead (<i>Mylopharodon conocephalus</i>), Sacramento pikeminnow (<i>Ptychocheilus grandis</i>), threespine stickleback (<i>Gasterosteus aculeatus</i>), and Pit sculpin (<i>Cottus pitensis</i>) (Xerces 2005). Current distribution is the Lassen, Modoc, and Shasta-Trinity National Forests. Species has been reported in the Truckee River, Fall River, and Pit River within California.	No	Suitable habitat present; however, not known to occur in the Tahoe National Forest or surrounding lands (USFS 2018).



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Bombus occidentalis</i>	western bumble bee	—	SCE	FSS	Open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Bumble bees require flowering plants that provide adequate pollen throughout the colony's life cycle, which can vary based on elevation, but typically ranges between early February to late November. Typically nests underground in abandoned rodent burrows, such as old squirrel or other animal nests, and in open west-southwest slopes bordered by trees, although a few nests have been reported from above-ground locations such as in logs among railroad ties. Availability of nests sites may depend on rodent abundance (IUCN 2019).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT	—	—	Dependent on host plant, elderberry (<i>Sambucus</i> spp.), which most commonly grows in riparian woodlands, but also in some upland habitats such as oak savannas and annual grasslands. Current presumed range in Central Valley extends from Shasta County south to Fresno County, including the valley floor and lower foothills up to about 500 feet in elevation (USFWS 2017).	No	Proposed Projects are outside of known elevation range.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Helisoma newberryi</i>	Great Basin rams-horn	—	—	FSS	Species known on the northern edges of the Great Basin, mainly Oregon and Washington. In California, the species is known to occur in Screwdriver Creek in Shasta County and Eagle Lake in Lassen County, California. Associated with cold, larger lakes and slow-moving rivers including spring fed sources. Individuals characteristically burrow in soft mud (USFS 2010).	No	Proposed Projects are outside of known species range.

Appendix C Biological Resources Information
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
 and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Juga nigrina</i>	black juga	—	—	FSS	Known in wetland habitats, seeps, springs, and slow-moving perennial waters (Taylor 1981). Species currently occurs in the Sacramento, McCloud, and Pit River systems (USFS 2018).	No	Suitable habitat present; however, not known to occur in Tahoe National Forest or surrounding lands (TNF 2018).



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Fish</i>							
<i>Catostomas platyrhynchus</i>	mountain sucker	—	SSC	—	Individuals prefer clear streams with moderate gradients with rubble, sand, or boulder bottoms. May also be present in a variety of other water including large rivers, turbid streams, and reservoirs. Individuals have been recorded to elevations as high as ~9,186 feet (2,800 meters) and at temperatures of 1°C–28°C. In streams, usually found in pools containing aquatic macrophytes, logs, or deeply undercut banks. Spawning habitat occurs in gravelly riffles immediately upstream of deep pools. In California, native to Lahontan drainage river basins (Moyle 2002).	No	Proposed Projects are outside of native range.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Gila bicolor pectinifer</i>	Lahontan Lake tui chub	—	—	FSS	Large, deep lakes for schooling and algal beds in shallow, inshore areas for successful spawning, embryo hatching, and larval survival (Moyle 2002). Found in Lake Tahoe, Pyramid Lake, and in nearby Walker Lake, Nevada (Moyle et al. 1989, 1995).	No	Proposed Projects are outside of known species range.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Hypomesus transpacificus</i>	delta smelt	FT	SE	—	Endemic to open waters of San Francisco Bay and the Sacramento-San Joaquin River Delta. Distribution includes San Pablo Bay up through Suisun Bay, upstream through the Delta to the Sacramento River below Isleton, and the San Joaquin River below Mossdale. Spawning is thought to occur in sloughs and shallow edge-water channels in the upper Delta and in Montezuma Slough near Suisun Bay. (USFWS 2010).	No	Proposed Projects are outside of known species range.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Mylopharodon conocephalus</i>	hardhead	—	SSC	FSS	Small to large streams in a low to mid-elevation environments. May also inhabit lakes or reservoirs. Preferred stream temperatures might easily exceed 20°C, though these fish do not favor low dissolved oxygen levels. Usually found in clear deep streams with a slow, but present flow. Though spawning may occur in pools, runs, or riffles, the bedding area will typically be characterized by gravel and rocky substrate. Species known to occur from the Sacramento-San Joaquin and Russian River drainages from the Pit River, Modoc County, in the north, and to the Kern River, Kern County in the south (UC Davis 2017).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus clarkii henshawi</i>	Lahontan cutthroat trout	FT	—	—	Generally inhabits lakes and streams. Spawning and nursery habitat characterized by cool water, pools in proximity to cover and velocity breaks, well vegetated stable stream banks, and silt free rocky substrates in riffle-run areas (USFWS 2009). In California, native to streams and lakes on the east side of the Sierras (Moyle 2002).	No	Proposed Projects are outside of known species range.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulling Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulling Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus tshawytscha</i> ESU spring-run	Central Valley spring-run Chinook salmon	FT	ST	—	Currently found in the Sacramento-San Joaquin River Delta, the Sacramento River and its tributaries, including American, Yuba and Feather Rivers, and Mill, Deer and Butte Creeks. Numbers of adults dependent on pool depth and volume, amount of cover, and proximity to gravel. Water temperatures greater than 27°C are lethal to adults (NMFS 2016).	No	Waters associated with the Proposed Projects are not connected to anadromous waters.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Prosopium williamsoni</i>	mountain whitefish	—	SSC	—	Most common in clear, cold streams with large pools that exceed ~3.28 feet (1 meter) in depth and in mountain lakes. In California, most of their populations are found at elevations of ~4,593–7,545 feet (1,400–2,300 meters). Spawning occurs in riffles (or wave-washed areas in lakes) in coarse gravel, cobble and rocks less than ~19.6 inches (50 centimeters) in diameter (Moyle 2002).	No	Proposed Projects are outside of known species range; species occupies stream and lakes on the east slope of the Sierra Nevada (Moyle 2002).

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
Amphibians							
<i>Ambystoma macrodactylum sigillatum</i>	southern long-toed salamander	—	SSC	—	Ranges in northeast California except for the Modoc Plateau. Generally found in grasslands, dry woodlands, coniferous forests, alpine meadows, sagebrush, and intermediate habitats between those listed. Can be found in disturbed agricultural areas. At high elevations, above 6,900 feet., permanent water bodies that are deeper than 6 feet. Hardwood forests and granitic slopes are also used for upland habitat. This species strongly prefers fishless water bodies (Thomson et al. 2016).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
 and Lower Drum Hydroelectric Project (FERC No. 14531)



<i>Rana boylei</i>	foothill yellow-legged frog	—	ST, SSC	FSS	<p>Ranges in the northern half of California except for the Central Valley, Modoc Plateau, and eastern side of the Sierra Nevada Mountains. Generally found in shallow flowing streams and rivers with at least cobble sized substrate. Breeding generally occurs at the margins of wide shallow channels with reduced flow variation near tributary confluences. Specifically, egg masses are placed in low flow locations on or under rocks with preferred substrates being boulders, cobbles, or gravel. Eggs have been found at depths to 87 centimeters in water velocities of 0–0.21 meters per second and at most 12.5 meters from shore. Maximum water temperature for breeding is 26°C, and 9°C to 21.5°C is the preferred range. Tadpoles avoid areas below 13°C and prefer temperatures between 16.5°C and 22.2°C (Thomson et al. 2016).</p>	Yes	Suitable habitat present.
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Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

<i>Rana draytonii</i>	California red-legged frog	FT	SSC	—	Ponds/streams in humid forests, woodlands, grasslands, coastal scrub, and streamsides with plant cover in lowlands or foothills. Breeding habitat includes permanent or ephemeral water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry. From sea level to 5,000 feet (1,525 meters). Occurs along the Coast Ranges from Mendocino County south to northern Baja California, and inland across the northernmost reaches of the Sacramento Valley and locally south through portions of the Sierra Nevada foothills as far south as northern Tulare County (Nafis 2020).	Yes	Suitable habitat present.
<i>Rana muscosa</i>	southern mountain yellow-legged frog	FE	SE	—	Lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the southern Sierra Nevada	No	Proposed Projects are outside of



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
					Mountains. Rocky streams in narrow canyons and in the chaparral belt in the mountains of southern California. Found from 984 feet to above 12,000 feet (370–3,660 meters) in elevation (Nafis 2020).		known species range.
<i>Rana sierrae</i>	Sierra Nevada yellow-legged frog	FE	ST	FSS	Inhabits lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the Sierra Nevada mountains. Open stream and lake edges with a gentle slope up to a depth of 2–3 inches (5–8 centimeters) seem to be preferred. Waters that do not freeze to the bottom and which do not dry up are required. Known from 984–12,000 feet (298–3,626 meters) (Nafis 2020).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
Reptiles							
<i>Emys marmorata</i>	western pond turtle	—	SSC	FSS	Ranges throughout California except for Inyo and Mono Counties. Generally occurs in various water bodies including permanent and ephemeral systems either natural or artificial. Upland habitat that is at least moderately undisturbed is required for nesting and overwintering, in soils that are loose enough for excavation (Thomson et al. 2016).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Phrynosoma balinvilli</i>	coast horned lizard	—	SSC	—	The species is known to occur in valley-foothill hardwood, riparian, and conifer habitats, and occasionally grasslands. They range from the Sierra Nevada foothills and throughout the central California coast. Individuals utilize loose soils for burrowing, forage in open areas or between shrubs, and do not require permanent water (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
Birds							
<i>Accipiter gentilis</i>	northern goshawk	—	SSC	FSS	Mature and old-growth forests including Ponderosa pine (<i>Pinus ponderosa</i>), Jeffrey pine (<i>Pinus jeffreyi</i>), Lodgepole pine (<i>Pinus contorta</i>), mixed conifer, Douglas-fir (<i>Pseudotsuga menziesii</i>), mixed Redwood-Douglas-fir hardwood, and quaking aspen (<i>Populus tremuloides</i>). Occurs in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mountains, in Mount Pinos and San Jacinto, San Bernardino, and White Mountains (Shuford and Gardali 2008).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulling Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Antigone canadensis tabida</i>	greater sandhill crane	—	ST, FP	FSS	Breeds in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. Winters in annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. Prefers treeless plains. Nests in remote portions of extensive wetlands or sometimes shortgrass prairies. In California, breeds only in Siskiyou, Modoc, and Lassen Counties, and in Sierra Valley in Plumas and Sierra Counties. Winters primarily in the Sacramento and San Joaquin Valleys from Tehama County south to Kings County (CDFW 2020c).	No	Proposed Projects are outside of species nesting and wintering range (CDFW 2020a).

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aquila chrysaetos</i>	golden eagle	BGEPA	FP	—	Habitat includes rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops. Uncommon resident in hills and mountains throughout California, and an uncommon migrant and winter resident in the Central Valley and Mojave Desert (CDFW 2020c).	Yes	Suitable habitat present.
<i>Contopus cooperi</i>	olive-sided flycatcher	—	SSC	—	Nests in a wide variety of forest and woodland habitats below 9,000 feet in the coastal and mountainous portions of the state (occurs only as a migrant elsewhere). Prefers forests and woodlands with adjacent meadows, lakes or open terrain for foraging. (CDFW 2020c).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Cypseloides niger</i>	black swift	—	SSC	—	Breeding sites are very specific: behind or beside permanent or semi-permanent waterfalls, on perpendicular cliffs near water and in sea caves. Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mountains, and in coastal bluffs and mountains from San Mateo County south to San Luis Obispo County (Shuford and Gardali 2008).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Empidonax traillii</i>	willow flycatcher	—	SE	FSS	Summer resident in wet meadows and montane riparian habitats from 2,000–8,000 feet elevation in the Sierra Nevada and Cascade Ranges. Most often found in open river valleys or large mountain meadows with lush shrubby willows. Has been observed breeding along the Santa Ynez River in Santa Barbara County, and along the Santa Clara River in Ventura County (CDFW 2020c).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Haliaeetus leucocephalus</i>	bald eagle	BGEPA	SE, FP	FSS	Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Requires large bodies of water or rivers with abundant fish, and adjacent snags. Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. About half of the wintering population is in the Klamath Basin (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Histrionicus histrionicus</i>	harlequin duck	—	SSC	—	Historically nested along rivers on the west slope of the central Sierra Nevada and wintered on the coast. They are observed very infrequently within their historic range but may be extirpated from the Yosemite region. They inhabit turbulent mountain rivers. They prefer streams with low acidity, steep banks, instream rocks and islands for roosting and nesting, and relatively high vegetative cover on stream banks (Shuford and Gardali 2008).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Lanius ludovicianus</i>	loggerhead shrike	—	SSC	—	Breed in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground (Shuford and Gardali 2008).	No	Species has potential to occur in migration or non-breeding season, but Proposed Projects are outside nesting range of species (CDFW 2020) ¹³ .

¹³ Only nesting loggerhead shrikes protected (CDFW 2020d)

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Laterallus jamaicensis coturniculus</i>	California black rail	—	ST, FP	—	Saline, brackish, and fresh emergent wetlands. Scarce, but true abundance difficult to determine due to small size and extremely secretive nature. Known to nest at scattered locations in the San Francisco Bay Area and Delta region, Point Reyes National Seashore, San Luis Obispo and Orange Counties, as well as the Imperial and Lower Colorado River Valleys. Appears intermittently and sparingly at a few locations in the Sacramento Valley (CDFW 2020c).	No	Suitable habitat not present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Setophaga petechia</i>	yellow warbler	—	SSC	—	Usually found in riparian deciduous habitats in summer: cottonwoods (<i>Populus</i> spp.), willows (<i>Salix</i> spp.), alders (<i>Alnus</i> spp.), and other small trees and shrubs typical of low, open-canopy riparian woodland. Also breeds in montane shrubbery in open conifer forests (CDFW 2020c).	Yes	Suitable habitat present.
<i>Strix nebulosa</i>	great gray owl	—	SE	FSS	Breeds in red fir, mixed conifer, or lodgepole pine habitats, always near wet meadows. Nests in large, broken-topped snags usually 25–72 feet (8–23 meters) above the ground. A rarely seen resident at 4,500–7,500 feet (1,400–2,300 meters) in the Sierra Nevada from the vicinity of Quincy, Plumas Counties south to the Yosemite region (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Strix occidentalis occidentalis</i>	California spotted owl	—	SSC	FSS	Older forests in areas of high canopy cover, with a multi-layered canopy, old decadent trees, a high number of large trees, and coarse downed woody debris. In California, ranges throughout the west slopes of the Sierra Nevada Mountains, and down the Coast Range Mountains from Carmel south through the Transverse Ranges nearly to Baja California (Shuford and Gardali 2008).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
Mammals							
<i>Antrozous pallidus</i>	pallid bat	—	SSC	FSS	Ranges across all of California except for high elevation portions of the Sierra Nevada Mountains and Del Norte, western Siskiyou, Humboldt, and northern Mendocino Counties. Generally found in a wide variety of habitats but with some preference for drier areas. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aplodontia rufa californica</i>	Sierra Nevada mountain beaver	—	SSC	—	Ranges in the Cascade, Klamath, and Sierra Nevada Mountains. Generally found in dense riparian forests and open shrubscapes around most forests. Specifically found with open to moderate canopy cover with a dense understory near water. This species requires deep friable soils and a cool moist microclimate (CDFW 2020c).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Canis lupis</i>	gray wolf	FE	SE	—	Habitat preferences appear to be more prey dependent than cover dependent. Territories have a variety of topographic features. Forests, open meadows, rocky ridges, and lakes or rivers all comprise a pack's territory. In the west, gray wolves have been known to follow the seasonal elevational movements of ungulate herds (Snyder 1991). Wolf packs in northern California, including the northern Sierras near Lassen have been documented in the last few years (CDFW 2020c).	Yes	Recent documentation of an individual gray wolf in Tahoe National Forest and a pack in the northern Sierras. Species may be found in areas associated with the Proposed Projects in the future (CDFW 2020).

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	—	SSC	FSS	Ranges throughout California except for high elevation portions of the Sierra Nevada Mountains. Generally prefers mesic habitats but known to occur in all non-alpine habitats of California. Roosting occurs in caves, tunnels, mines, buildings, or other structures and this species may use different roosting sites for day and night (CDFW 2020c).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Euderma maculatum</i>	spotted bat	—	SSC	—	Ranges along the eastern half of California as well as all of southern California except for Orange County and southern Los Angeles County. Generally occurs in desert, mixed conifer, and grassland habitats. Specifically, this species prefers to roost in rock crevices on cliffs but will sometimes use caves and buildings (CDFW 2020c).	Yes	Suitable habitat present.
<i>Gulo gulo</i>	California wolverine	FCT	ST, FP	FSS	Mixed conifer, red fir (<i>Abies magnifica</i>), and lodgepole habitat. Probably associated with subalpine conifer, alpine dwarf-shrub, wet meadow, and montane riparian habitats between 4,300–7,300 feet (1,311–2,225 meters) (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Lepus americanus tahoensis</i>	Sierra Nevada snowshoe hare	—	SSC	—	Ranges in the Northern Sierra Nevada range and the Cascade, Warner, and Klamath Mountains. Generally occurs in montane riparian habitats. Specifically occurs in areas with a dense understory of typically chaparral and mature alders and willows with some presence of young coniferous trees (CDFW 2020c).	Yes	Suitable habitat present.
<i>Martes caurina sierrae</i>	Sierra marten	—	—	FSS	Species is uncommon in the Sierra Nevada Range. Preferred habitat includes mixed evergreen forests with large trees and snags within mixed conifer, Jeffrey pine, and lodgepole pine habitats. Species prefers areas with minimal human influence and disturbance (CDFW 2020c).	Yes	Suitable habitat present.



Table C-6. Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Myotis thysanodes</i>	fringed myotis	—	—	FSS	Widespread in California, occurring in all but the Central Valley and Colorado and Mojave Deserts. It occurs in a wide variety of habitats; records range in elevation from sea level to 9,350 feet (2,850 meters) in New Mexico (Barbour and Davis 1969). Optimal habitats are pinyon-juniper, valley foothill hardwood and hardwood-conifer, generally at 4,000–7,000 feet (1,300–2,200 meters) (CDFW 2020c).	Yes	Suitable habitat present.
<i>Pekania pennanti</i>	fisher	—	SSC	FSS	Large areas of mature, dense forest stands with snags and greater than 50% canopy closure. Uncommon permanent resident of the Sierra Nevada, Cascades, and Klamath Mountains; also found in a few areas in the North Coast Ranges (USFWS 2014).	Yes	Suitable habitat present.

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PG&E's Upper Drum-SpaULDing Hydroelectric Project (FERC No. 2310)
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Table C-6. Special-status Species: Proposed Upper Drum-SpaULDing Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Taxidea taxus</i>	American badger	—	SSC	—	Ranges in all of California except the extreme northwest corner. Generally found in drier open areas of habitats with friable soils (CDFW 2020c).	Yes	Suitable habitat present.
<i>Vulpes vulpes necator</i>	Sierra Nevada red fox	FC	ST	FSS	Found in a variety of habitats, including alpine dwarf-shrub, wet meadow, subalpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer, Jeffrey pine, eastside pine, montane hardwood-conifer, and ponderosa pine. Most sightings above 7,000 feet (2,134 meters), ranging from 3,900–11,900 feet (1,189–3,627 meters). Dens in rocky outcrops, hollow logs and stumps, and burrows in friable soil (CDFW 2020c).	Yes	Suitable habitat present.

Sources: California Department of Fish and Wildlife, November 2018, Special Animals List, <https://www.wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>, CDFW Biogeographic Data Branch, Sacramento.
Notes: USFWS = U.S. Fish and Wildlife Service; CDFW = California Department of Fish and Wildlife; DPS = Distinct



Population Segment

Species Status:

Federal (USFWS and USFS): BGEPA = Bald and Golden Eagle Protection Act, FE = Endangered, FT = Threatened, FCE = Candidate Endangered, FCT = Candidate Threatened, FCD = Candidate for delisting, BLMS = BLM Sensitive, FSS = Forest Service Sensitive

State (CDFW): SE = Endangered, ST = Threatened, SCE = Candidate Endangered, SCT = Candidate Threatened, SCD = Candidate for delisting, FP = Fully Protected, SSC = Species of Special Concern

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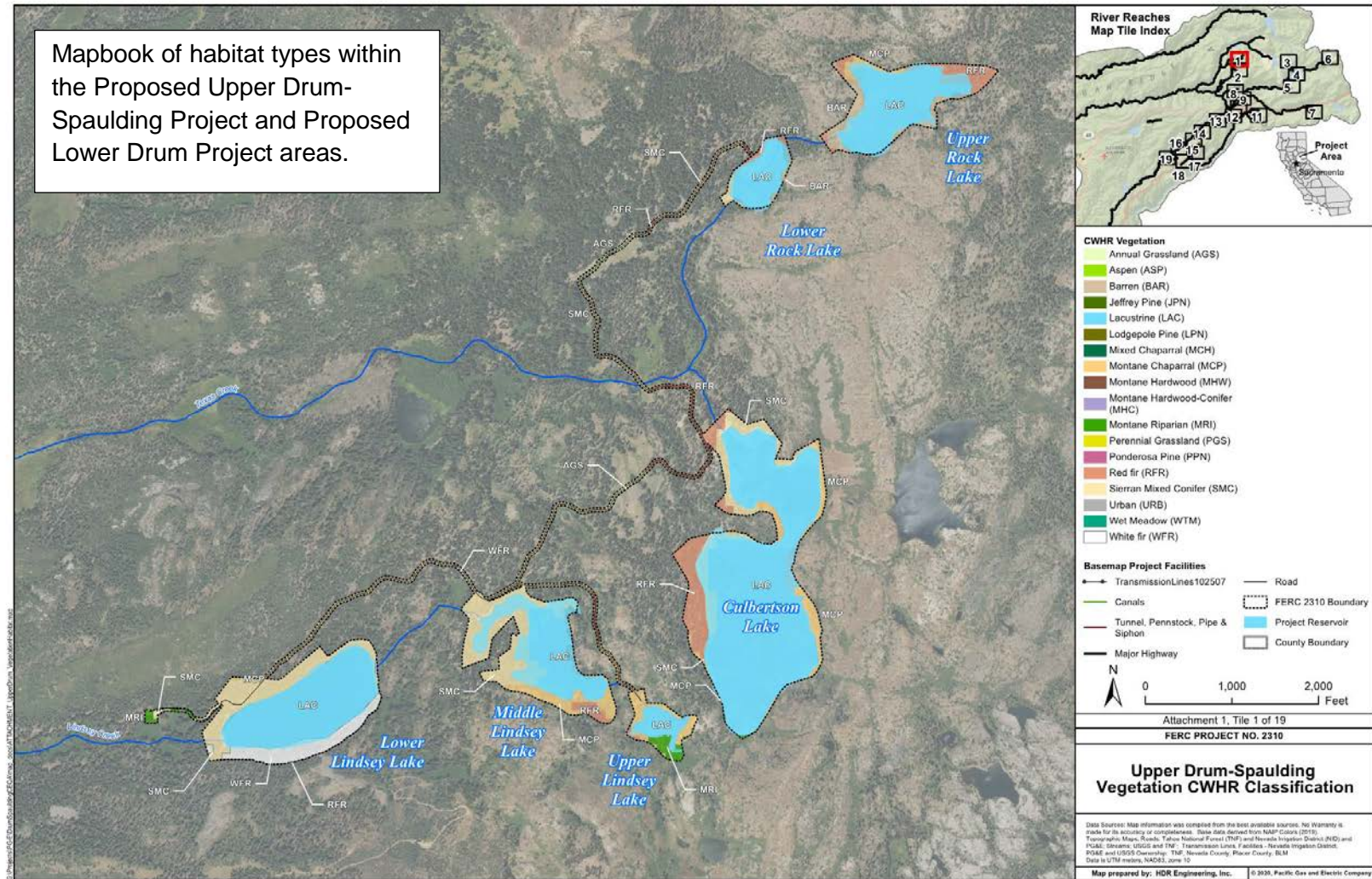
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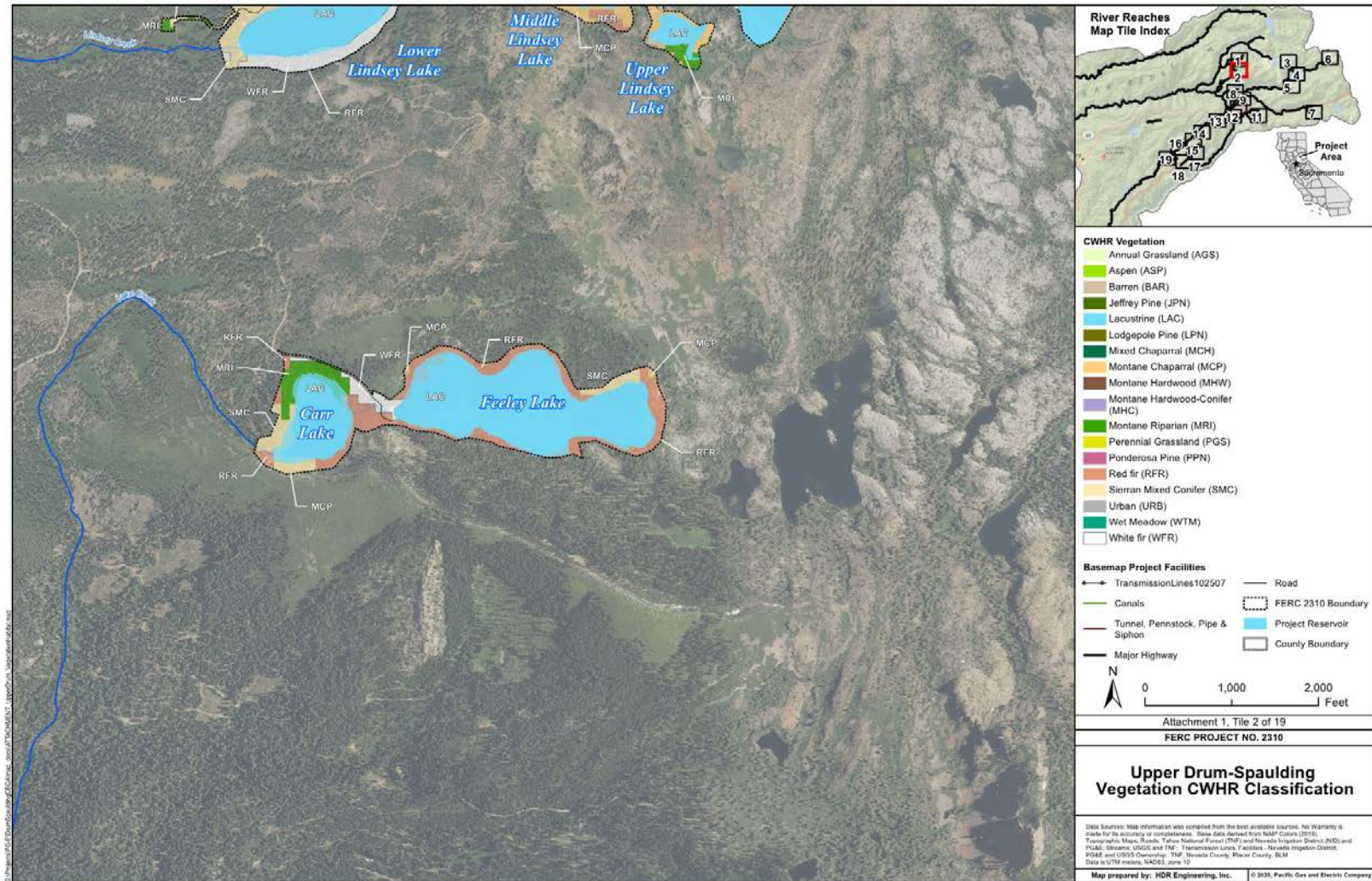
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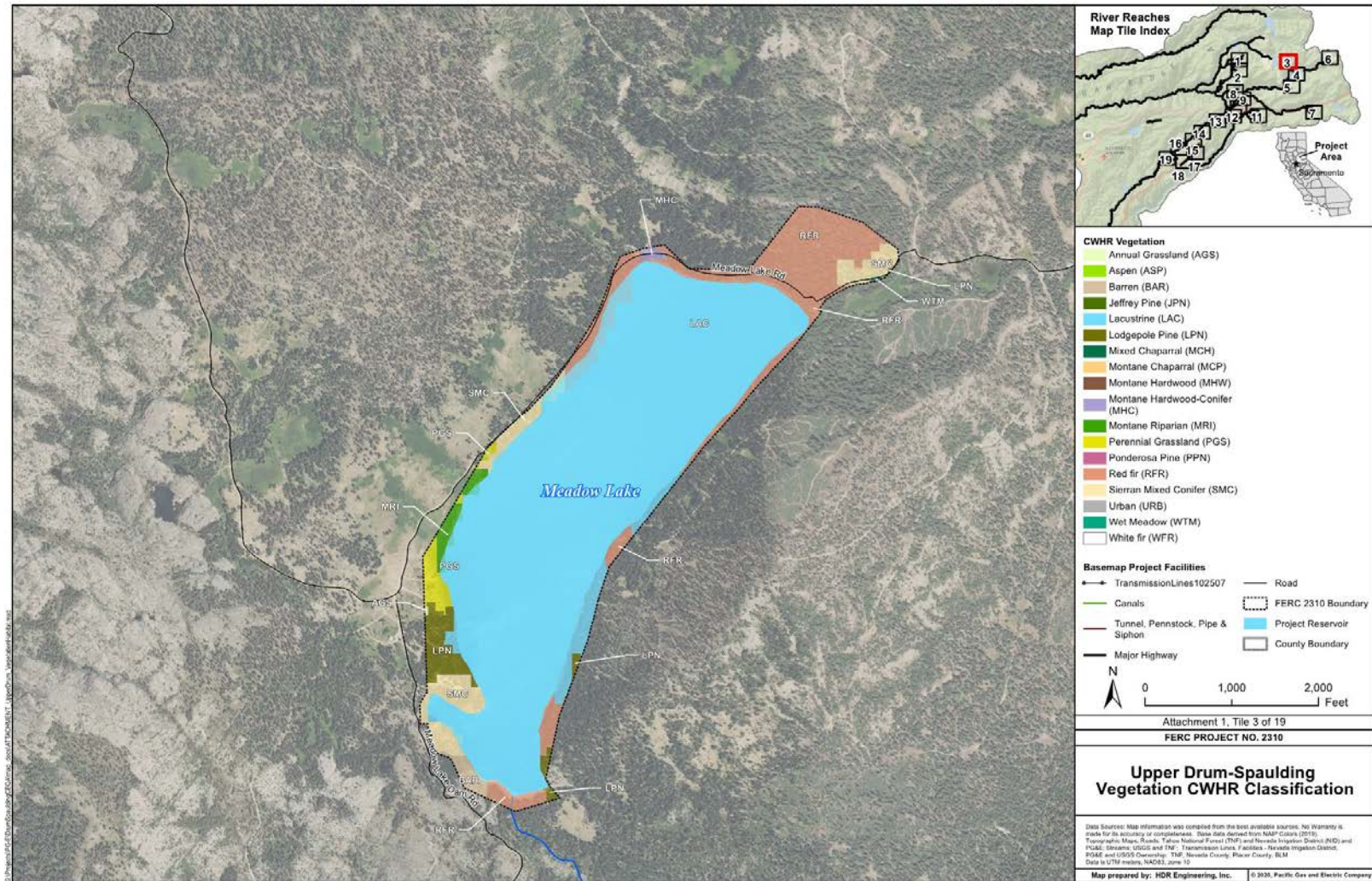
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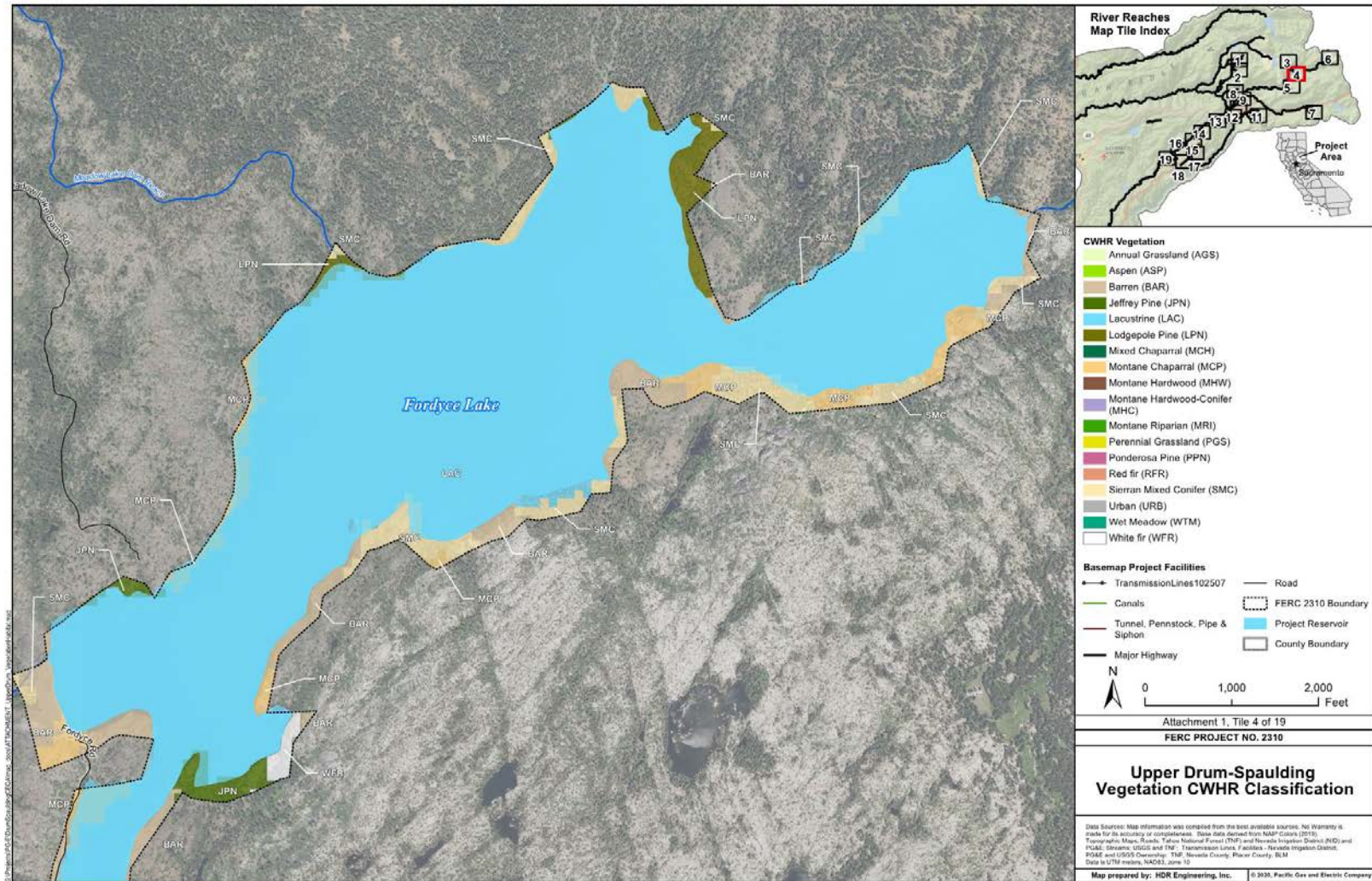
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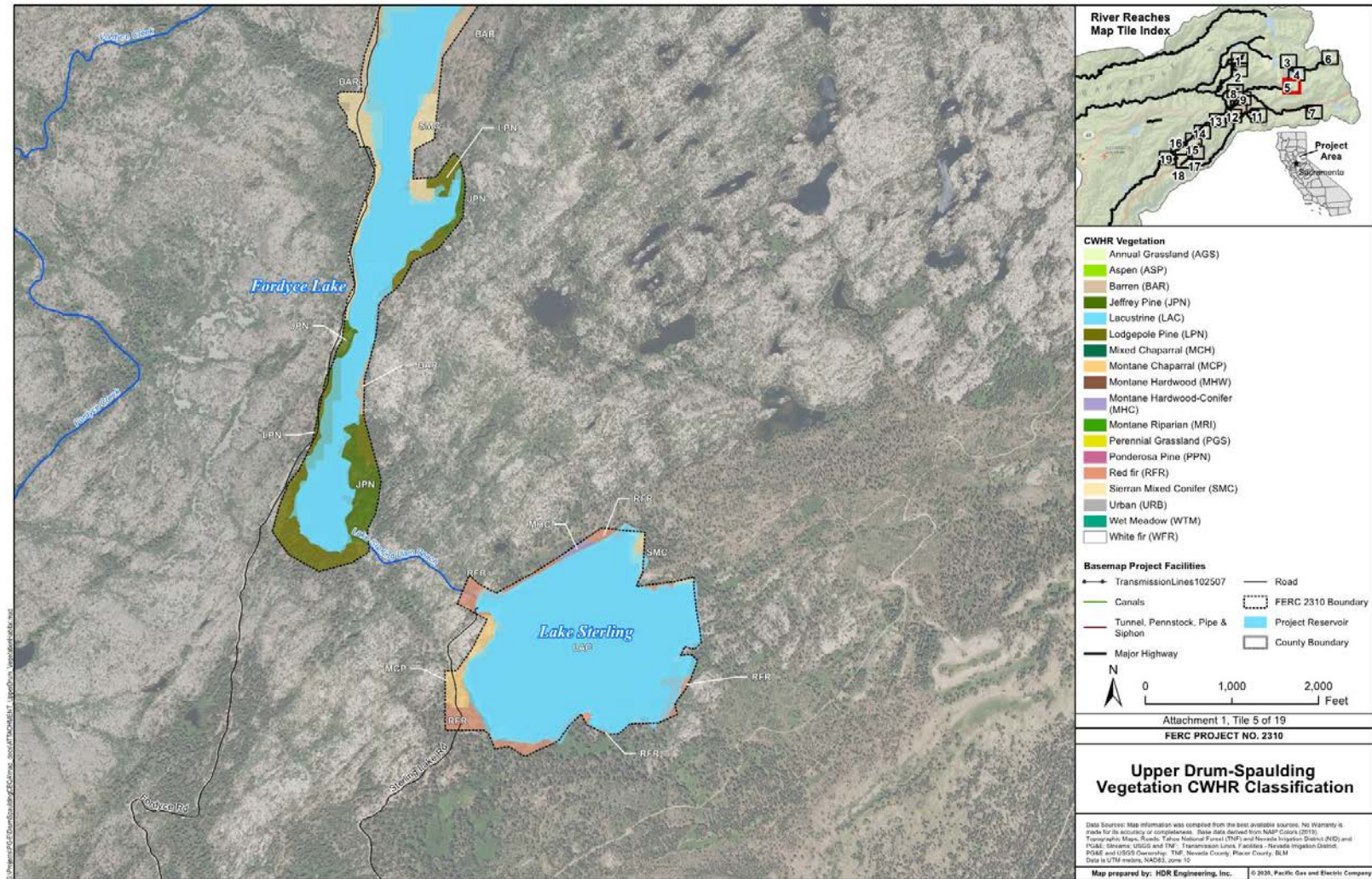
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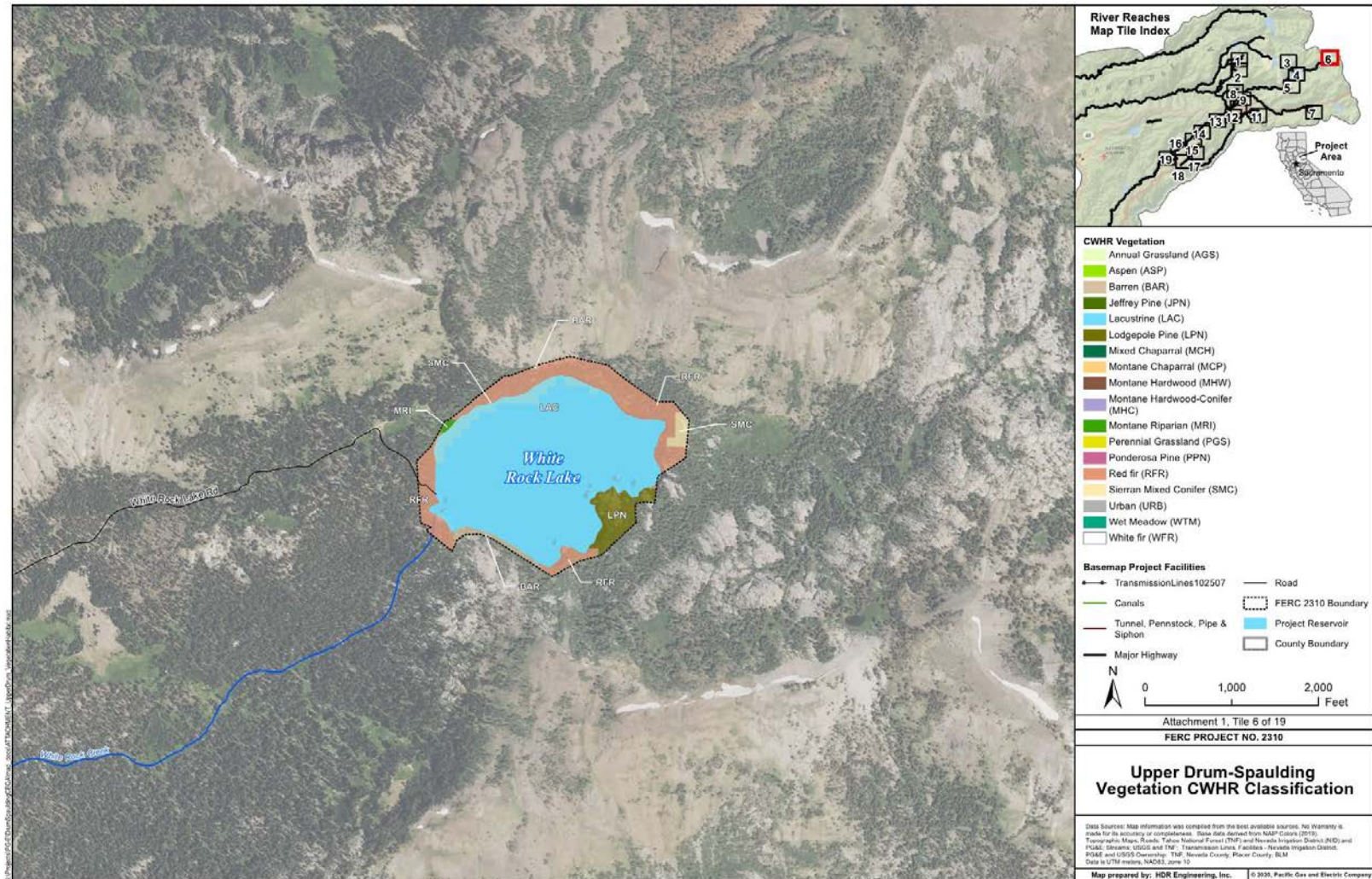
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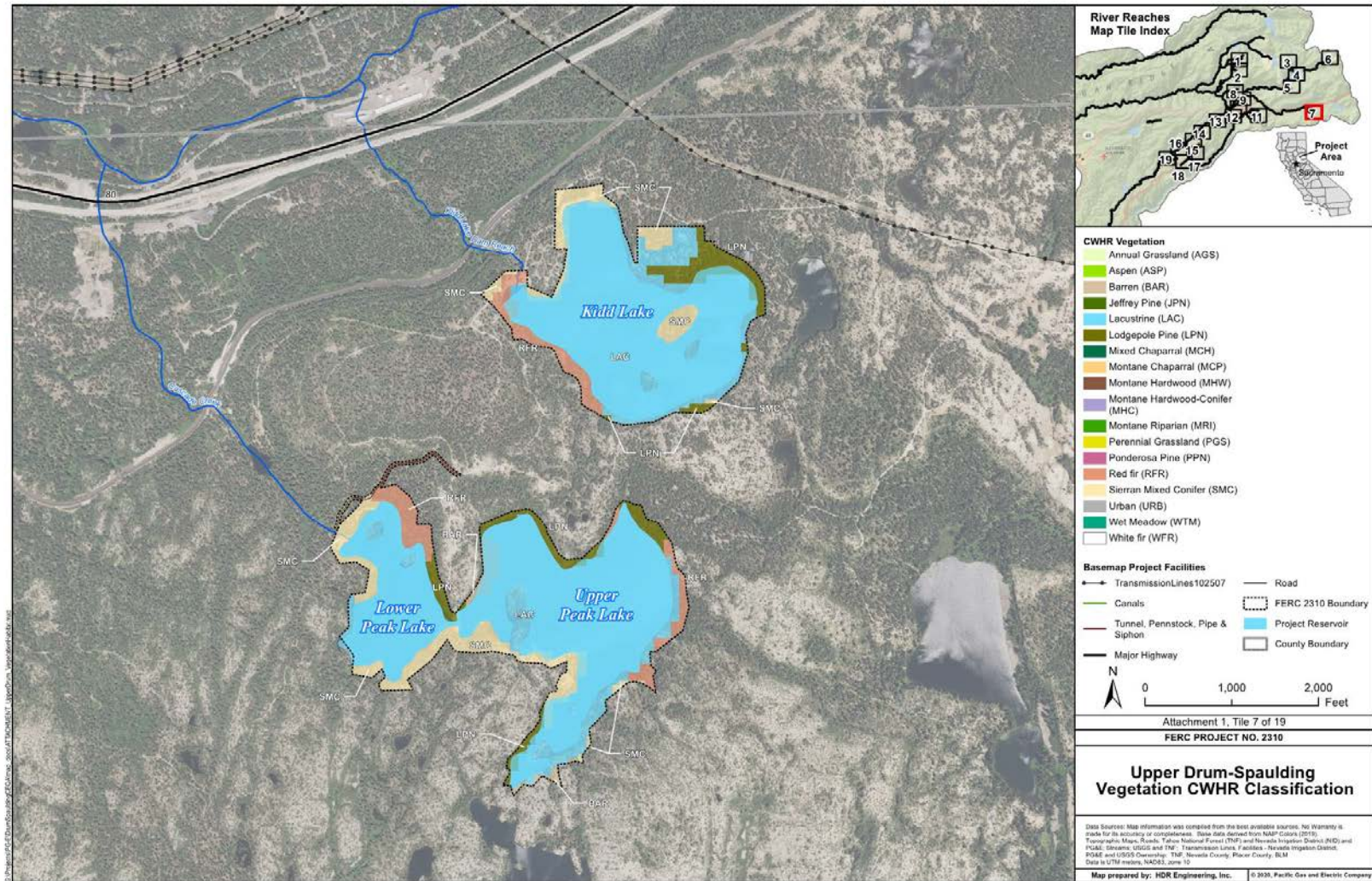
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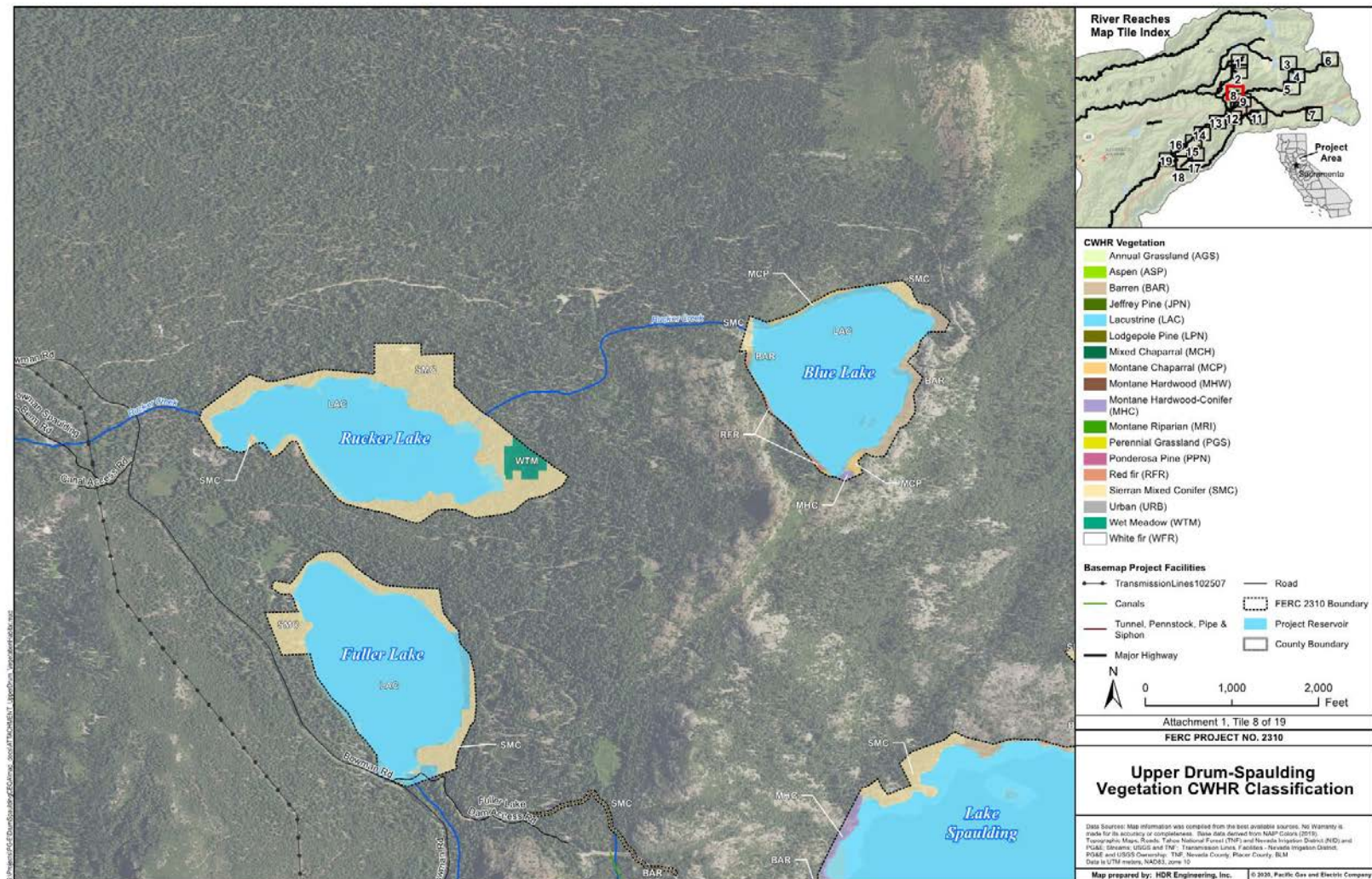
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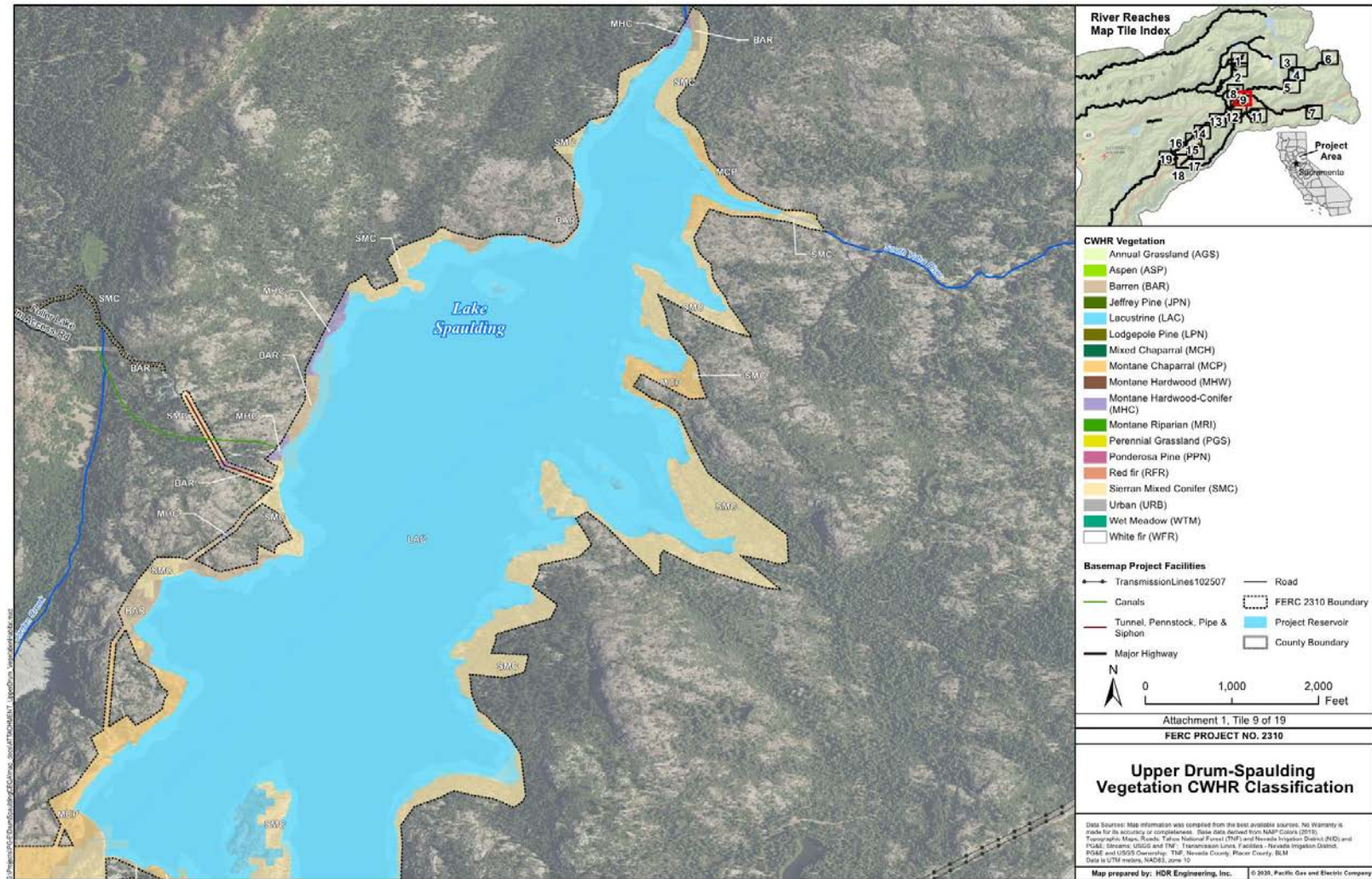
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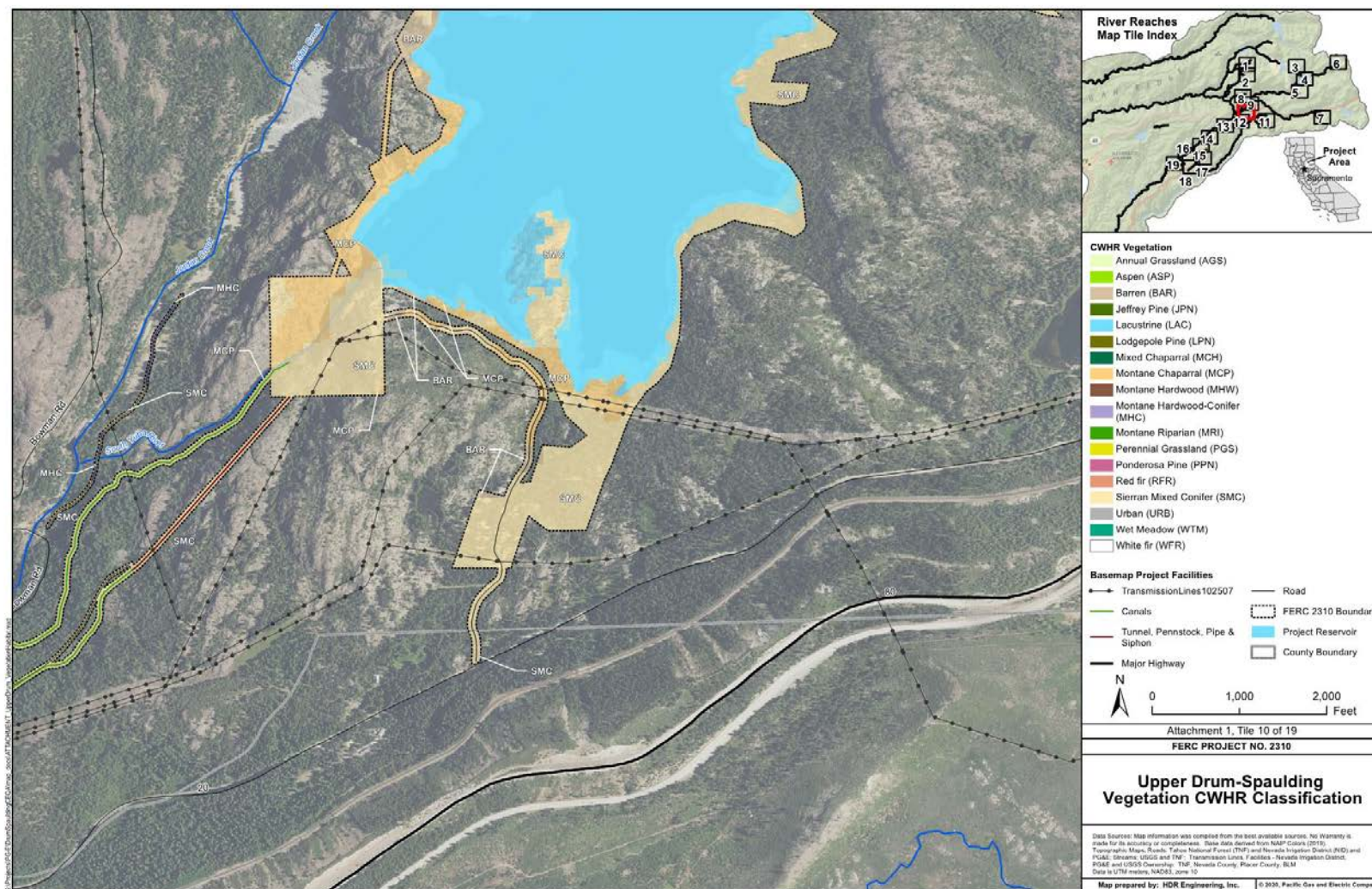
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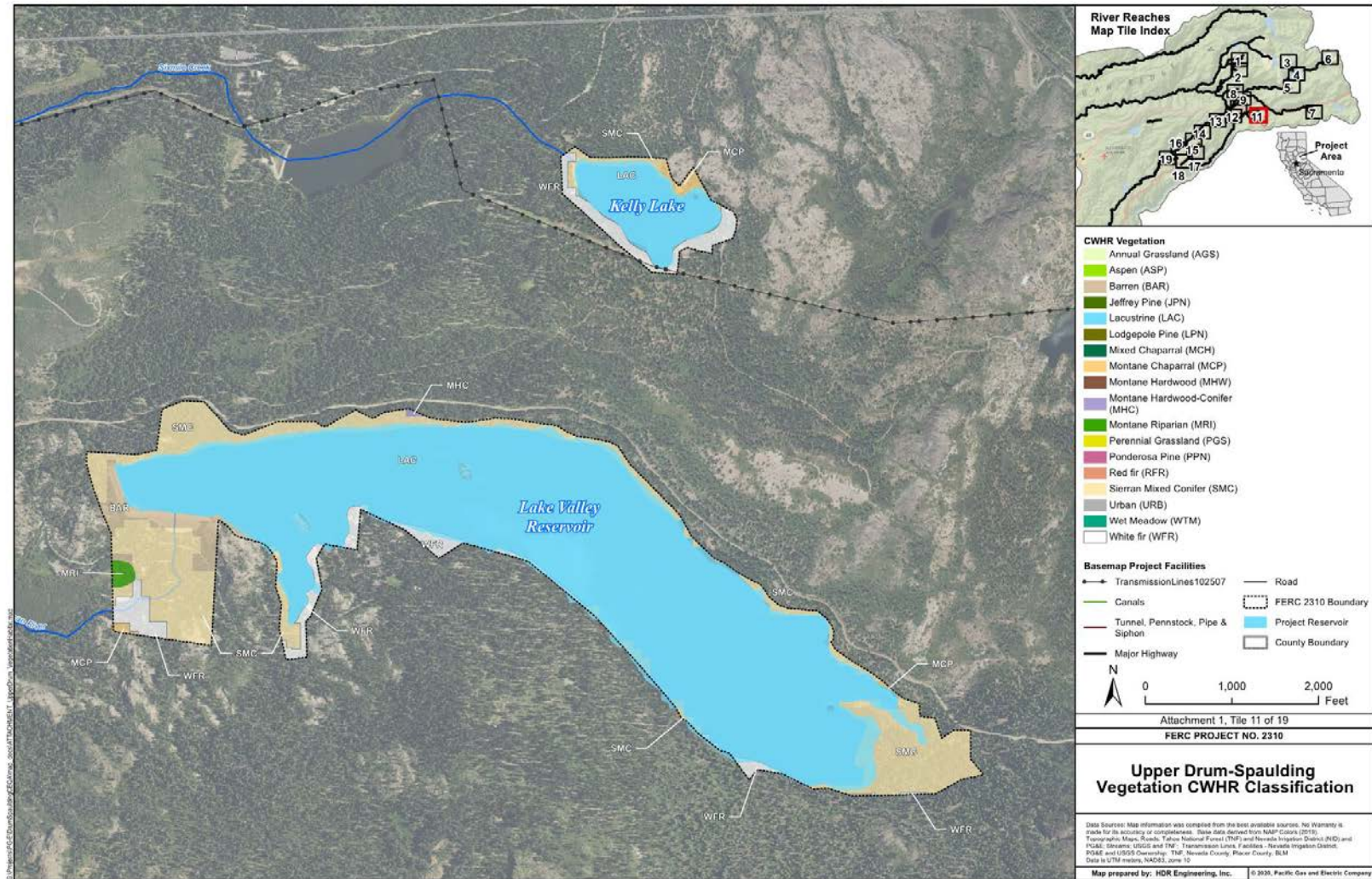
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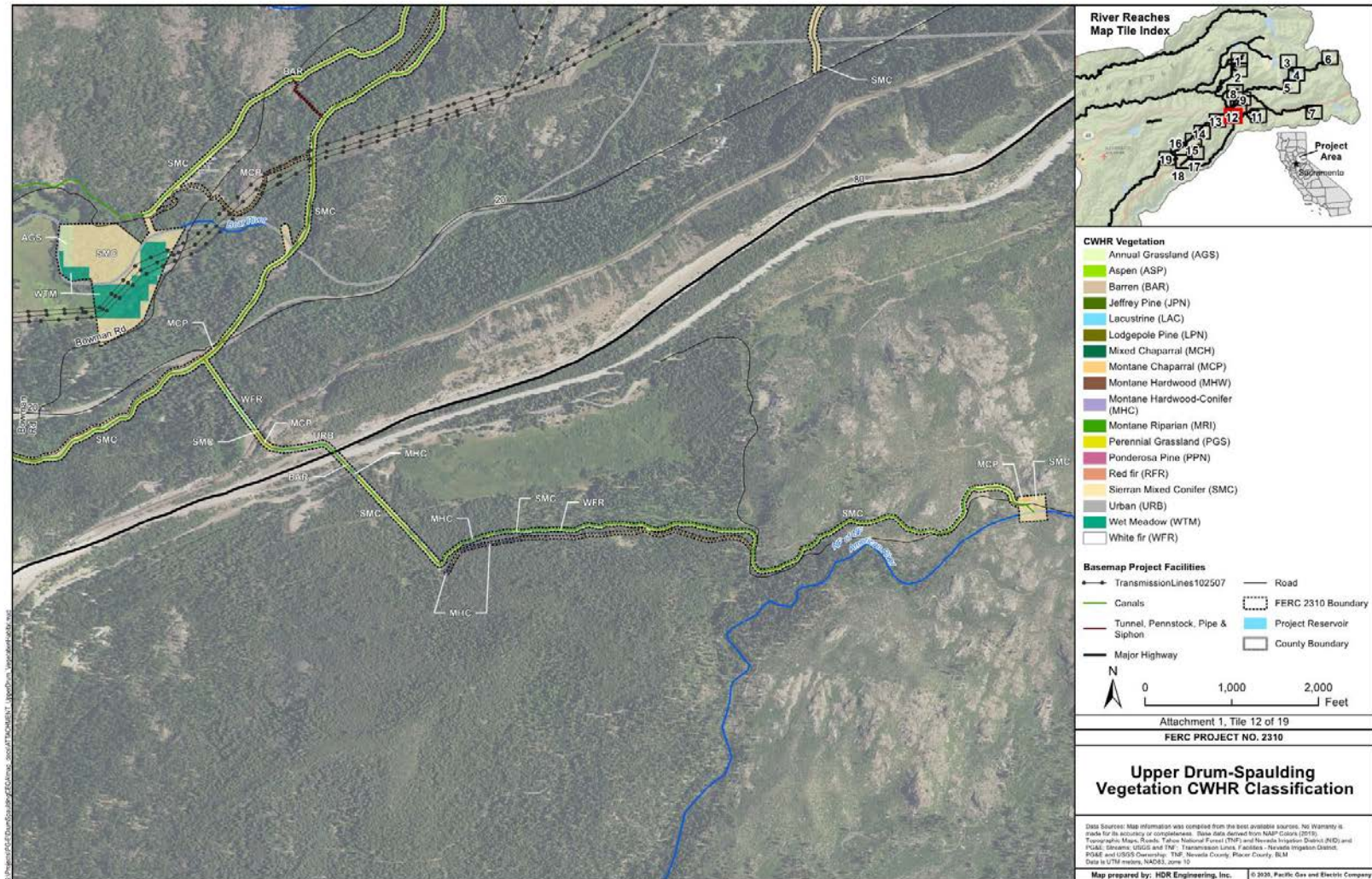
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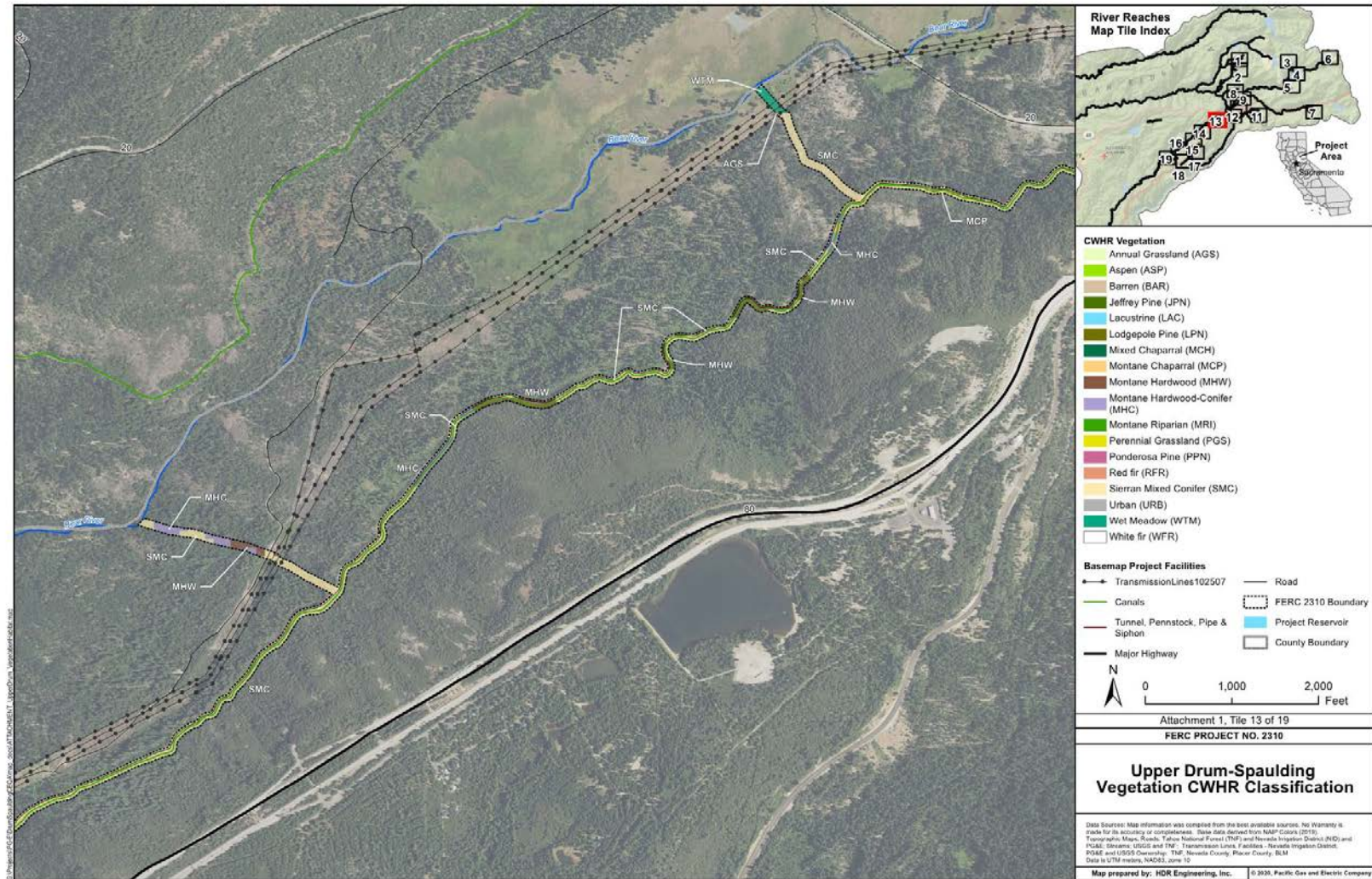
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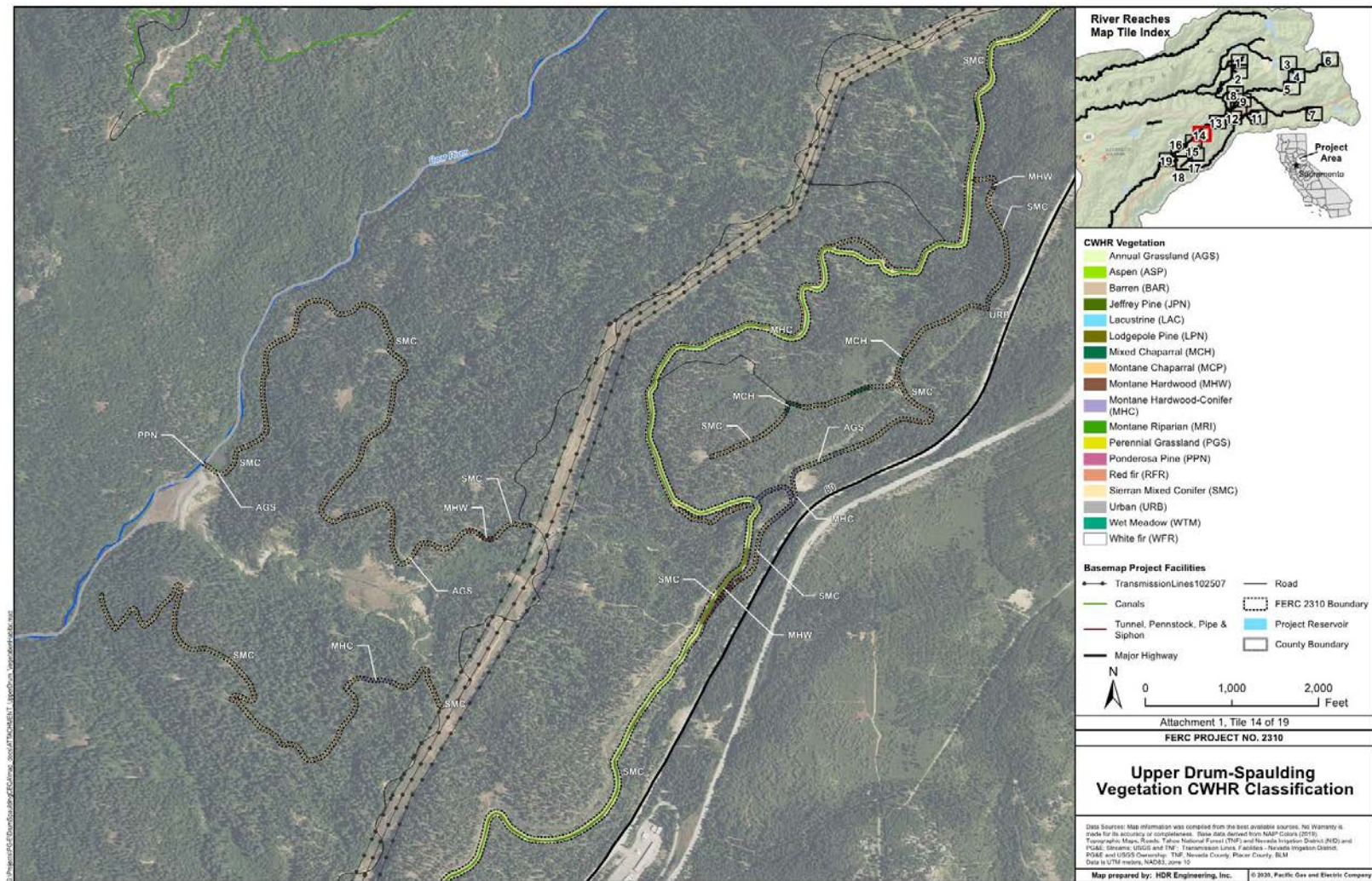
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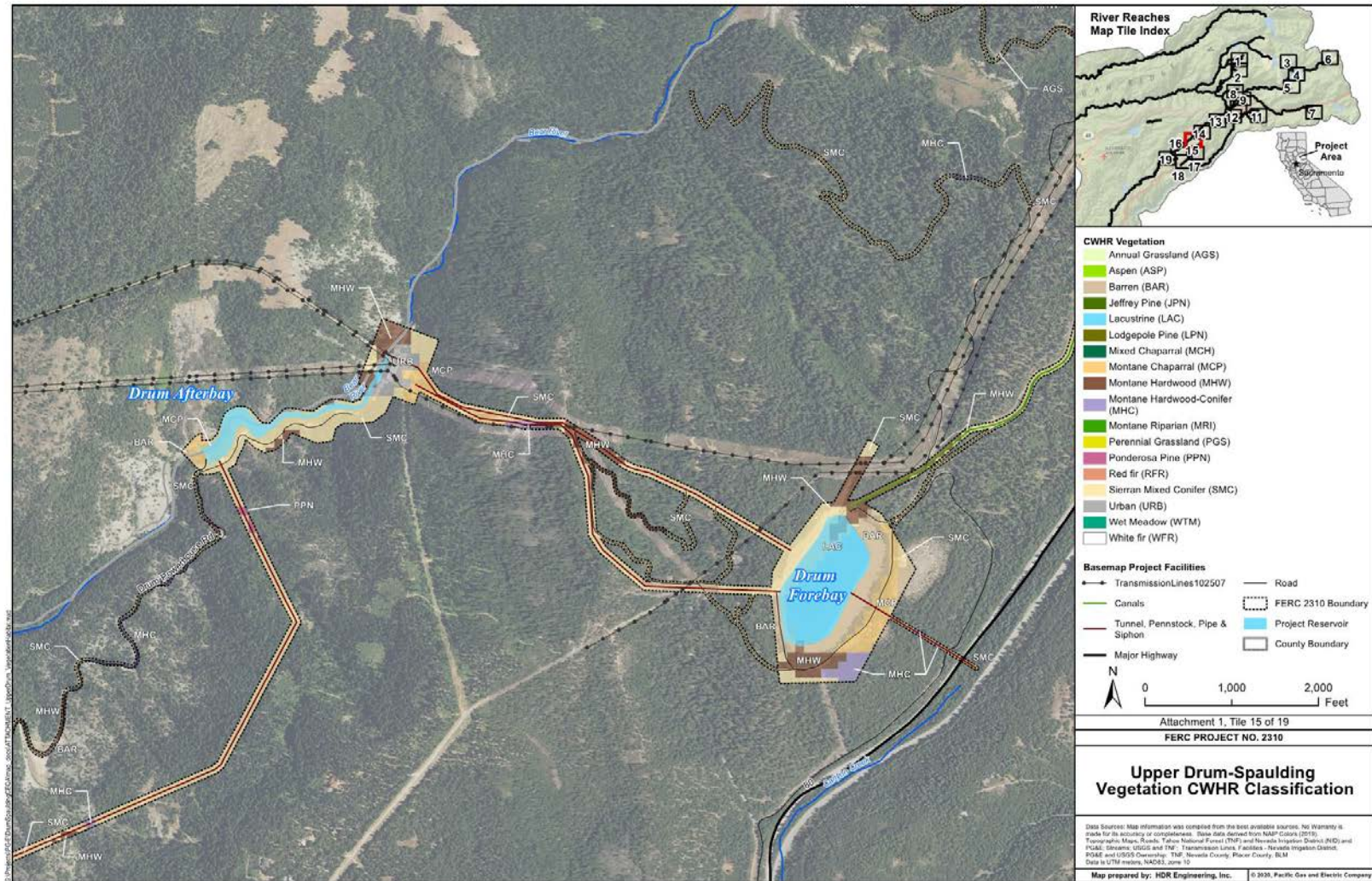
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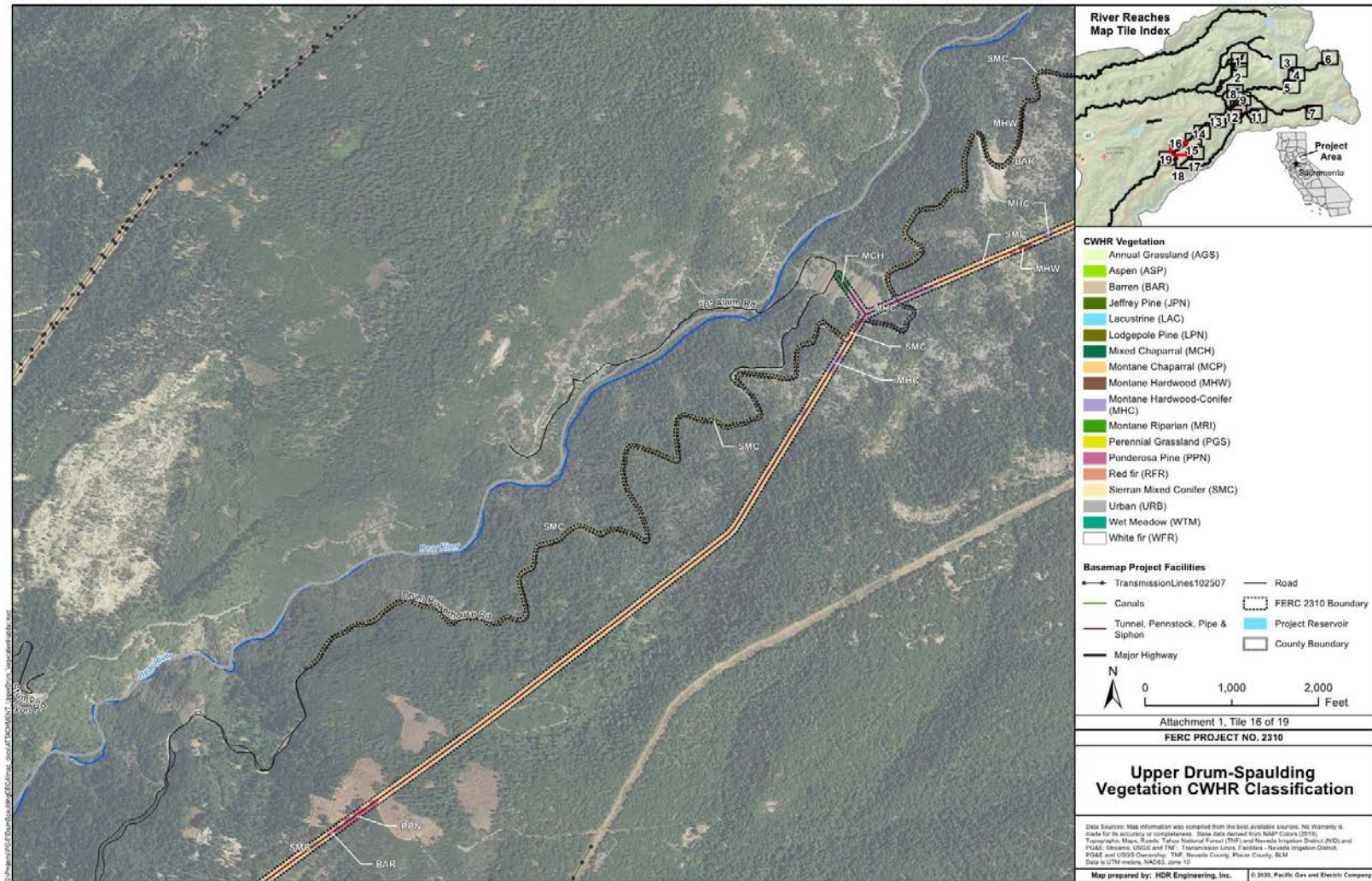
Appendix C Biological Resources Information
PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)
and Lower Drum Hydroelectric Facilities (FERC No. 14531)



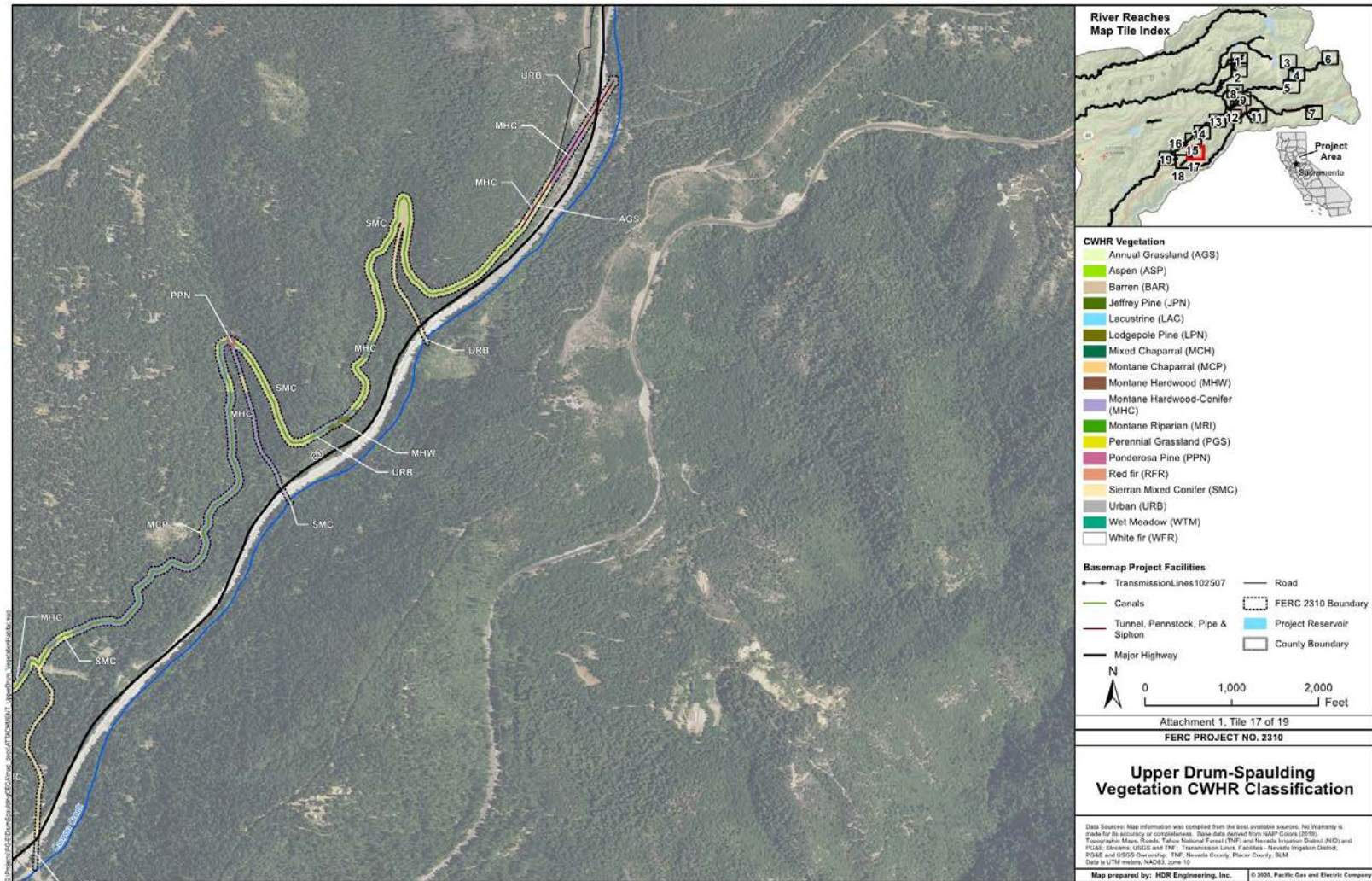
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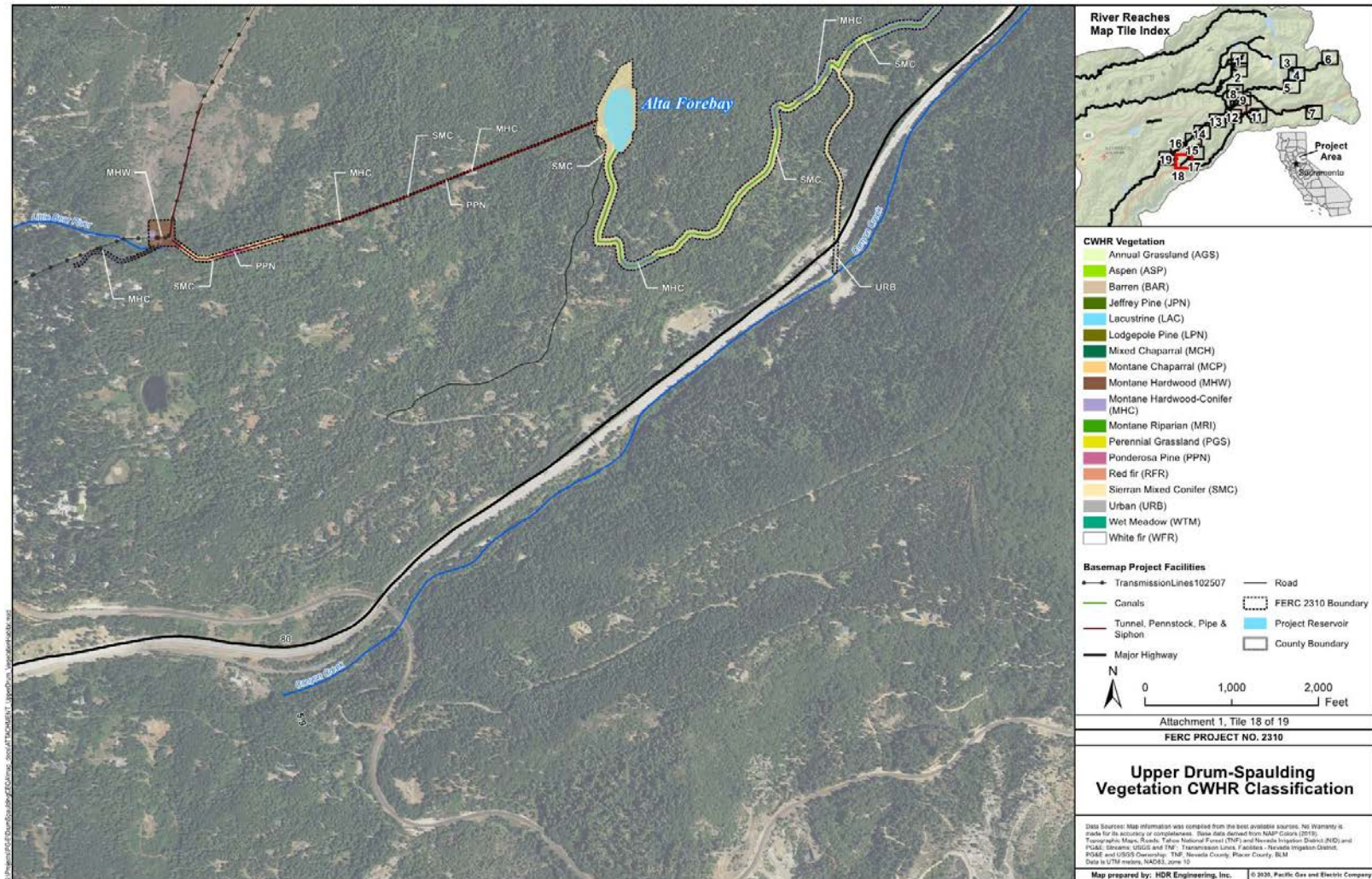
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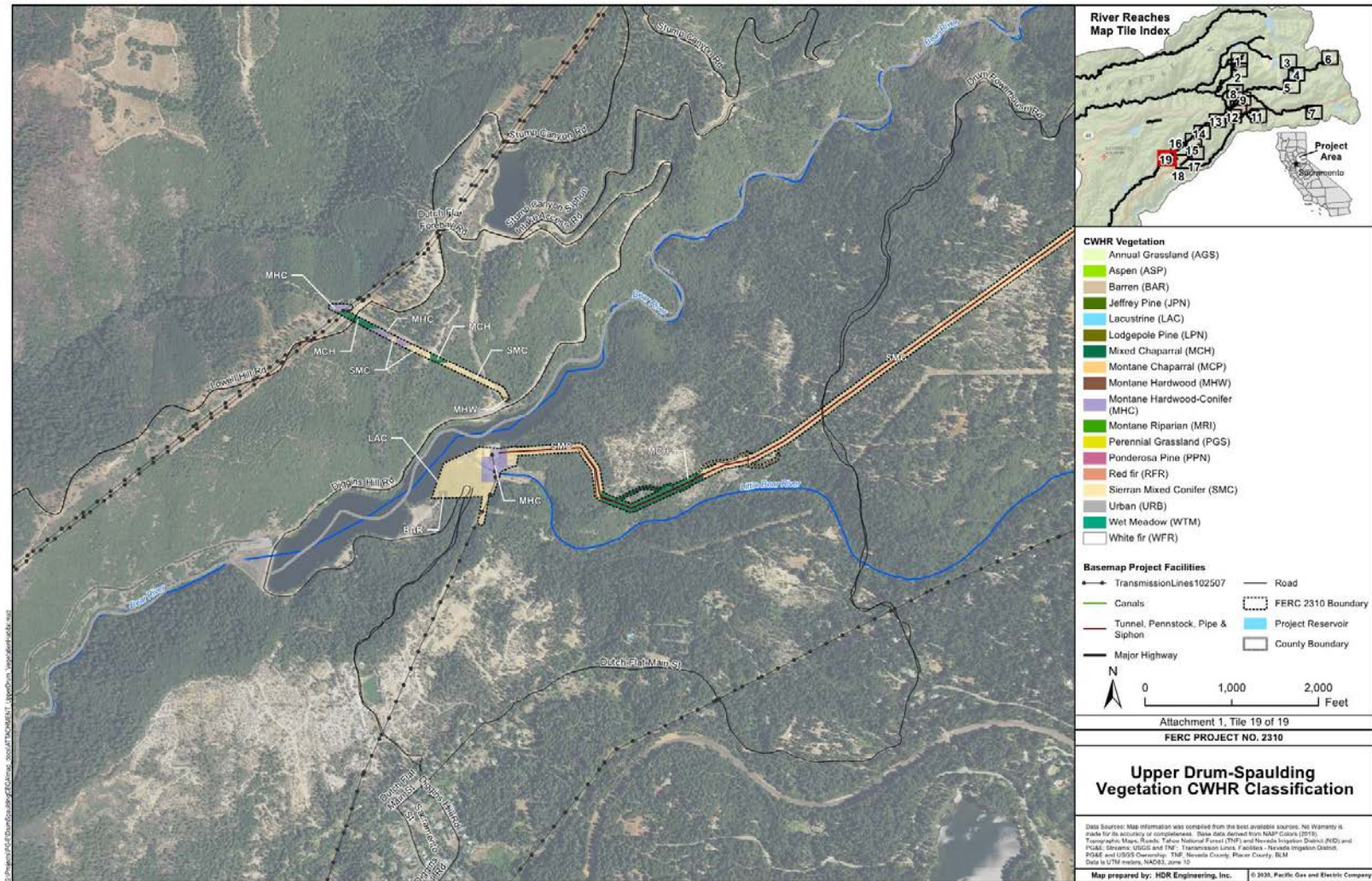
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Appendix C Biological Resources Information
 PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)
 and Lower Drum Hydroelectric Facilities (FERC No. 14531)





Appendix D – Upper Drum-Spaulding & Lower Drum Hydraulic Modeling Assessment

PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310) and Lower Drum Hydroelectric Project (FERC No. 14531)

Nevada and Placer Counties, California
December 2020

Prepared for:

State Water Resources Control Board

Prepared by:

HDR

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1 Hydraulic Modeling Assessment

This hydraulic modeling assessment was performed by Megan Lionberger, P.E., on February 7, 2020.

Pacific, Gas and Electric (PG&E) and Nevada Irrigation District (NID) operate hydroelectric projects in the Yuba and Bear River watersheds. These projects share water conveyances and operate together under a coordinated operations agreement. As part of the joint Federal Energy Regulatory Commission (FERC) relicensing process of PG&E's Drum-Spaulding Hydroelectric Project and NID's Yuba-Bear Hydroelectric Project, several modeling tools were developed to assess impacts of proposed changes to operations of the two projects. These same tools were used to support the CEQA analysis for the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project (collectively Proposed Projects).

Since its application, PG&E has divided the Drum-Spaulding Project into three projects: Upper-Drum Spaulding, Lower Drum, and Deer Creek. A reservoir operations model was developed using HEC-ResSim with a time step of one day to simulate operations of the combined 40-plus reservoirs used by the projects. Development of the operations model included developing synthetic unimpaired hydrology for water years 1976 through 2008, and water supply demands for water users in the basin. The operations model prioritizes releases for environmental flow requirements, followed by discretionary releases for water supply and hydropower generation. Output generated by the model includes reservoir storage, tributary flows downstream of reservoirs, and water delivery volumes. A water rights post-processor was developed in Microsoft Excel to post-process HEC-ResSim output to quantify water supply availability and to track water delivery deficits to NID and the Placer County Water Agency (PCWA). The modeling period of record, 1976 through 2008, covers a diverse range of hydrologic conditions including extreme drought, moderate extended drought, and large flood events.

The modeling tools were used to simulate the operations of the Proposed Projects under existing FERC license conditions and under proposed license conditions as described in PG&E's Amended Application for New License and FERC's Final Environmental Impact Statement. The following summarizes substantial differences between the two scenarios as they relate to the volume and timing of flows:

- Environmental flow requirements increase under projected license conditions and are expanded to include additional Project-affected reaches.
- Spill cessation is included under proposed license conditions below several dams to minimize short-term, high-flow fluctuations in downstream reaches.

- Reservoir storage is drawn down more under proposed license conditions to meet higher environmental flow requirements while maintaining water supply deliveries. This is offset somewhat in drier water years by the need for a larger environmental flow reserve pool. Table D-1 and Table D-2 compares water levels in Upper-Drum Spaulding Reservoirs between proposed license conditions and existing license conditions.

The onset of spill releases from Proposed Projects' reservoirs tend to be delayed under proposed license conditions because reservoirs are operating at lower storage levels than under existing license conditions when reservoirs are not spilling. Once reservoirs fill, spill releases are the same under both scenarios. No new flooding occurs in downstream reaches relative to existing license conditions. Consequently, channel velocities will not increase, resulting in new or additional channel erosion.

Tables of modeled annual NID and PCWA water delivery deficits based on existing (water year 2001 to 2009 average) water supply demands are presented in Table D-3 and Table D-4. Water deliveries to PCWA reported in these tables were provided exclusively by PG&E. Deficits were limited to water years 1977 and 1978 under existing FERC license conditions. Water year 1977 is the driest year on record, even compared with the recent 2012 to 2015 drought. Deficits in 1978 result from the carryover of dry conditions from water year 1977. Under proposed license conditions, deficits increased in 1977 and were approximately the same 1978. There was also an additional small deficit in water year 1976 for NID, the second driest year in the period of record. Overall, there was relatively little change to water supply reliability except in the driest of years, when water supply was already affected. The annual demands used in the model were the full demands, and do not include demand reduction resulting from drought contingency plans. NID and PCWA user demands would likely have been reduced in 1976 and 1977 based on pre-determined drought plans and agreements once water deficits were anticipated. Therefore, the deficits in both the existing and proposed license conditions are conservatively high.

These results represent a bookend analysis of impacts on water supply between the current conditions and the Proposed Projects. Assuming that the Yuba-Bear Project and Lower Drum Project operate under existing license conditions, impacts on water deliveries would go down for NID, but would be approximately the same for PCWA. The majority of unrecoverable increases in environmental flows, relative to existing conditions, is associated with the Upper Drum-Spaulding Project below Lake Spaulding.

Most PG&E reservoirs represented as the Drum-Spaulding Project are associated with the Upper Drum-Spaulding Project. The Lower Drum Project is operated, in part, to provide water to PCWA. Even without the Lower Drum Project, operation of the Upper



Drum-Spaulding Project would be relatively unchanged due to contractual requirements to provide water to in-basin users downstream of the Upper Drum-Spaulding Project. Therefore, the results of this assessment do not identify a need for additional modeling to assess the relative impacts of changes in operation of the Upper Drum-Spaulding Project to the Lower Drum Project.

Table D-1. Summary of Predicted Reservoir Elevation Impacts, by Water Year Type, of PG&E's Proposed Projects Coupled with Projected (Year 2062) Future Water Deliveries at Fordyce Lake

Fordyce Lake											
PG&E's Proposed Projects with 2062 Water Supply (Operations Model Scenario Name: L030311-P)											
Reservoir Elevation Differences (as compared to No-Action Alternative)											
Median Reservoir Level by Date and Water Year Type (feet)											
Water Year Type	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	30-Sep
Critically dry	-4.6	-5.1	-6.3	-8.7	-11.7	-14.4	-10.3	-11.3	-13.9	-16.9	-17.8
Dry	-1.5	-2.1	-0.6	-2.7	-4.9	-2.1	0.0	0.1	0.5	0.6	-0.8
Below normal	-0.9	-0.8	-0.3	0.0	-1.7	0.0	0.0	0.2	0.4	0.5	-1.4
Above normal	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	-0.1	-1.0
Wet	-0.5	0.0	0.0	0.0	0.0	-0.1	0.0	0.2	0.3	-0.4	0.0

Table D-2. Summary of Predicted Reservoir Elevation Impacts, by Water Year Type, of PG&E's Proposed Projects Coupled with Projected (2062) Future Water Deliveries at Lake Spaulding

Lake Spaulding											
PG&E's Proposed Projects with 2062 Water Supply (Operations Model Scenario Name: L030311-P)											
Reservoir Elevation Differences (as compared to No-Action Alternative)											
Median Reservoir Level by Date and Water Year Type (feet)											
Water Year Type	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	30-Sep
Critically dry	0.2	1.0	5.3	10.3	7.3	7.7	-2.7	-2.7	-2.2	-2.2	-4.4
Dry	0.1	0.6	0.4	4.4	7.8	4.7	2.1	2.6	2.9	2.5	3.1
Below normal	-3.3	0.0	0.0	-0.1	1.9	0.0	0.3	0.6	0.6	0.6	0.9
Above normal	-2.5	-2.5	0.0	0.0	0.2	0.0	-0.7	-1.5	-2.6	-3.1	-3.9
Wet	0.0	0.0	0.0	0.0	0.0	0.1	-0.7	-1.3	-0.6	-0.6	-3.0



Table D-3. Percentage of Combined Yuba-Bear/Drum-Spaulding Water Deliveries Met, by Month and Year Base Case-EBF

Water Year	Annual Totals (% of Target Delivery)		Annual Totals (Delivery Deficit, acre-feet)		PG&E Water that needed to be purchased to Meet Min. Flow in Bear River Reach to Lake Combie (acre-feet)
	NID	PCWA	NID	PCWA	
1976	100%	100%	0	0	0
1977	62%	76%	57,000	28,000	13,000
1978	93%	92%	11,000	9,000	4,000
1979	100%	100%	0	0	0
1980	100%	100%	0	0	0
1981	100%	100%	0	0	0
1982	100%	100%	0	0	0
1983	100%	100%	0	0	0
1984	100%	100%	0	0	0
1985	100%	100%	0	0	0
1986	100%	100%	0	0	0
1987	100%	100%	0	0	0
1988	100%	100%	0	0	0
1989	100%	100%	0	0	0
1990	100%	100%	0	0	0
1991	100%	100%	0	0	0
1992	100%	100%	0	0	0
1993	100%	100%	0	0	0
1994	100%	100%	0	0	0
1995	100%	100%	0	0	0
1996	100%	100%	0	0	0
1997	100%	100%	0	0	0
1998	100%	100%	0	0	0
1999	100%	100%	0	0	0
2000	100%	100%	0	0	0
2001	100%	100%	0	0	0
2002	100%	100%	0	0	0
2003	100%	100%	0	0	0
2004	100%	100%	0	0	0
2005	100%	100%	0	0	0
2006	100%	100%	0	0	0
2007	100%	100%	0	0	0
2008	100%	100%	0	0	0

Appendix D Hydraulic Modeling Assessment
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)
and Lower Drum Hydroelectric Project (FERC No. 14531)

Table D-4. Percentage of Combined Yuba-Bear/Drum-Spaulding Water Deliveries Met, by Month and Year in PG&E's Proposed Projects (L061812-EBFSC)

Water Year	Annual Totals (% of Target Delivery)		Annual Totals (Delivery Deficit, acre-feet)		PG&E Water that needed to be purchased to Meet Min. Flow in Bear River Reach to Lake Combie (acre-feet)
	NID	PCWA	NID	PCWA	
1976	99%	100%	2,000	0	0
1977	50%	66%	76,000	39,000	20,000
1978	92%	92%	12,000	9,000	2,000
1979	100%	100%	0	0	0
1980	100%	100%	0	0	0
1981	100%	100%	0	0	0
1982	100%	100%	0	0	0
1983	100%	100%	0	0	0
1984	100%	100%	0	0	0
1985	100%	100%	0	0	0
1986	100%	100%	0	0	0
1987	100%	100%	0	0	0
1988	100%	100%	0	0	0
1989	100%	100%	0	0	0
1990	100%	100%	0	0	0
1991	100%	100%	0	0	0
1992	100%	100%	0	0	0
1993	100%	100%	0	0	0
1994	100%	100%	0	0	0
1995	100%	100%	0	0	0
1996	100%	100%	0	0	0
1997	100%	100%	0	0	0
1998	100%	100%	0	0	0
1999	100%	100%	0	0	0
2000	100%	100%	0	0	0
2001	100%	100%	0	0	0
2002	100%	100%	0	0	0
2003	100%	100%	0	0	0
2004	100%	100%	0	0	0
2005	100%	100%	0	0	0
2006	100%	100%	0	0	0
2007	100%	100%	0	0	0
2008	100%	100%	0	0	0



As noted in the “General Assumptions” above, this model run does not include any block flows (as suggested by Foothill Water Network) or any Bureau of Reclamation demands below Newcastle Powerhouse. Also, the model run does not include agency-suggested spill cessation in the Upper Bear River, Drum Afterbay, and Rollins Dam. If these proposals were included, effects on power generation, water deliveries, hydrology, and reservoir elevations may change. Also, the model itself is being modified on a regular basis based on observations/requests by relicensing participants. Any future modifications to the model may also affect the results presented for this model run.

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