

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 5847E
As of August 10, 2020

Subject: Grant of Easement to California Department of Water Resources for Relocation Work Related to the Oroville Spillway Incident Request for Approval under Public Utilities Code Section 851 and General Order 173

Division Assigned: Energy

Date Filed: 06-11-2020

Date to Calendar: 06-17-2020

Authorizing Documents: None

Disposition:	Accepted
Effective Date:	07-11-2020

Resolution Required: No

Resolution Number: None

Commission Meeting Date: None

CPUC Contact Information:

edtariffunit@cpuc.ca.gov

AL Certificate Contact Information:

Annie Ho

415-973-8794

PGETariffs@pge.com

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



To: Energy Company Filing Advice Letter

From: Energy Division PAL Coordinator

Subject: Your Advice Letter Filing

The Energy Division of the California Public Utilities Commission has processed your recent Advice Letter (AL) filing and is returning an AL status certificate for your records.

The AL status certificate indicates:

- Advice Letter Number
- Name of Filer
- CPUC Corporate ID number of Filer
- Subject of Filing
- Date Filed
- Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)
- Effective Date of Filing
- Other Miscellaneous Information (e.g., Resolution, if applicable, etc.)

The Energy Division has made no changes to your copy of the Advice Letter Filing; please review your Advice Letter Filing with the information contained in the AL status certificate, and update your Advice Letter and tariff records accordingly.

All inquiries to the California Public Utilities Commission on the status of your Advice Letter Filing will be answered by Energy Division staff based on the information contained in the Energy Division's PAL database from which the AL status certificate is generated. If you have any questions on this matter please contact the:

Energy Division's Tariff Unit by e-mail to
edtariffunit@cpuc.ca.gov

June 11, 2020

Advice 5847-E
(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: Grant of Easement to California Department of Water Resources for Relocation Work Related to the Oroville Spillway Incident – Request for Approval under Public Utilities Code Section 851 and General Order 173

Purpose

Pacific Gas and Electric Company (PG&E) requests approval under Public Utilities Code Section 851 (Section 851) and General Order 173, to grant the California Department of Water Resources (DWR) a perpetual non-exclusive easement agreement (Easement, included as Attachment 1) located on PG&E fee-owned property¹ near Lake Oroville in unincorporated Butte County, California (Property). The Easement areas within the Property are located near Oroville Dam Boulevard to the North East of the City of Oroville.

The proposed Easement would grant DWR permission to occupy the Property to construct, operate, and maintain three (3) 230 kilovolt (kV) power lines and four (4) underground electric and communication conduits on PG&E's Property. This is necessary safety work as described in the Oroville Spillway Emergency Response and Recovery Resources Report (OER Resources Report)² regarding the Oroville Spillway Incident in February 2017 (Incident). The OER Resources Report is included herein as Attachment 2.

The purchase fee for the Easement is \$80,300. The fair market value was determined by a formal appraisal performed by Bender Rosenthal Inc., dated February 9, 2018, included herein as Attachment 3.

PG&E has inspected the Property and determined that the proposed Easement will not interfere with PG&E's operations or PG&E's ability to provide safe and reliable utility

¹ PG&E's property consists of two separate parcels; Assessor's Parcel Nos. 069-010-019-000 (139.93 acres) and 033-010-055-000 (96.49 acres).

² *Oroville Spillway Emergency Response and Recovery Resources Report*, California Department of Water Resources; dated January 24, 2018.

service to its customers. In addition, said Easement will not be adverse to the public interest.

Background

PG&E owns land, buildings, and other facilities in connection with the provision of electric and natural gas services to its customers throughout northern and central California. In the provision of these services, PG&E relies on a portfolio of fee properties, rights-of-way, and facilities to support its electric and gas activities. Some of these properties are adjacent to those owned by DWR.

The Property, which is approximately 236.42 acres, is owned by PG&E for the purpose of housing portions of the Table Mountain-Palermo 230kV and Palermo-Oroville #2 60kV Electric Transmission facilities.

DWR owns the Oroville Dam, located on the Feather River, approximately 75 miles north of Sacramento, California, and five miles northeast of the City of Oroville, and operates the dam facilities under a license from FERC (FERC Hydroelectric Project No. 2100). The DWR-owned real property on which the Oroville Dam is located is adjacent to the Property.

In February of 2017, the Oroville Dam main spill way and emergency spillway suffered extensive erosion and damage. Due to high inflows into Lake Oroville and reduced outflow capacity on the main spillway, Lake Oroville overtopped the adjacent emergency spillway on February 11, 2017, which resulted in back-cutting erosion on the emergency spillway that threatened the stability of the emergency spillway's crest structure. Subsequent increased operation of the main spillway led to the loss of the lower portion of the spillway chute and caused significant erosion near the spillway failure site.

To ensure public safety following the Incident, DWR was required to complete emergency response and recovery activities before seasonal rainfall began in November 2017, as the rainfall could have required the use of the main or emergency spillways. As a result, this work was initiated in late February 2017, pursuant to DWR's Oroville facilities Emergency Action Plan (EAP). As part of this effort, DWR immediately routed two (2) temporary electrical lines (shoofly) partially around the repair sites to transmit power generated from the Hyatt Pumping-Generating Plant. In May 2017, DWR submitted an initial filing to the FERC to notify them of the emergency response and recovery effort that was deployed in February 2017 per the EAP. The FERC filing is included herein as Attachment 4. After obtaining an amendment to its license from FERC on August 23, 2017, DWR proceeded to permanently reroute its Oroville-Table Mountain 230 kV overhead electrical facilities (Oroville-Table Mountain Facilities), away from the area of the project spillways and associated construction activities. This work, a portion of which took place on the Property, was completed in October 2018, including site stabilization and restoration. DWR has a standing requirement to ensure that the

facilities can reliably and permanently transmit electricity during the repair of the damaged sites, thereby necessitating the need to relocate the electrical facilities immediately.³ PG&E learned of the Oroville-Table Mountain permanent relocation work in February 2018.

In addition to the overhead electrical facilities, an existing DWR underground 13.8kV power feeder cable (Feeder Cable) and associated existing fiber optic system (Fiber Optic System) were compromised during the Incident. Sections of the Power Feeder Cable were exposed by erosion, which has placed the cable at risk of failure. Also, DWR system communications rely on the Fiber Optic System, which is buried underground along the same corridor and, in some places within the same trench, as the Feeder Cable. The proposed Easement would allow the future relocation of the Feeder Cable and the Fiber Optic System.

While the existing Fiber Optic System and Feeder Cable will remain in service during construction and installation of the new conduit and cables, they will be decommissioned and abandoned in place after the new Fiber Optic and Feeder Cables are commissioned. Once the new Fiber Optic System and Feeder Cable are relocated, power and communication will be transferred from the existing cables to the new cables, to minimize disruption to Oroville Dam operations. The new Feeder Cable and Fiber Optic System will be installed completely underground in conduit.⁴

The proposed Easement would grant DWR retroactive permission to occupy the Property to install, operate and maintain the Oroville-Table Mountain Facilities, and to conduct the necessary relocation of the Feeder Cable and the Fiber Optic System. The proposed Easement area is approximately 25.83 acres. The proposed Easement area consists of three (3) separate areas on the Property:

- 1) a tower line easement area (25.54 acres) for the Oroville-Table Mountain Facilities,
- 2) an underground cable easement area (.22 acres) for the Feeder Cable and Fiber Optic System, and
- 3) an underground cable easement area (.07 acres) for the Feeder Cable and Fiber Optic system.

All three (3) Easement areas are shown on Exhibit B of the Easement.

³ Federal Energy Regulatory Commission, Office of Energy Projects, Division of Hydropower Administration and Compliance; *Environmental Assessment; Amendment of Project License to Reroute Primary Transmission Line, Feather River*, August 2017, included herein as Attachment 5 (Environmental Assessment).

⁴ California Department of Water Resources; *Oroville Spillway Emergency Response and Recovery, Resource Report*; January 24, 2018, included herein as Attachment 2.

Providing an easement for the relocation of these facilities benefits the public. First, the Oroville-Table Mountain Facilities that have already been relocated, had to be moved because they created a physical obstacle that would have interfered with reconstruction of the damaged Oroville Dam spillways. Relocating the transmission lines removed this potential hazard, thereby expediting spillway construction activities and allowing the dam to return to service sooner. Furthermore, the new location of the Oroville-Table Mountain Facilities is farther from the area that flooded during the Incident. As such, this relocation helps ensure the reliable transmission of electricity from DWR's Hyatt Pumping – Generating Plant so that the plant can continuously pass flows out of Lake Oroville.⁵

Providing an easement for relocation of the underground 13.8kV power lines and fiber optic cable also benefits the public because both provide important support to Oroville Dam operations. The 13.8kV power lines are a source of electricity for the Oroville Dam and the fiber optic cable enables effective communication to and from the Oroville Dam.

PG&E has reviewed the DWR facility relocations and determined they will not interfere with PG&E's transmission line operation and maintenance, or PG&E's ability to provide safe and reliable utility service to its customers. PG&E will be able to continue its operation and maintenance of electrical transmission facilities after executing the Easement.

Tribal Lands Policy

On December 5, 2019, the Commission adopted a policy titled, "Investor-Owned Utility Real Property – Land Disposition - First Right of Refusal for Disposition of Real Property Within the Ancestral Territories of California Native American Tribes" (Policy). While the Policy notes that guidelines for its implementation are not yet in place, it directs investor-owned utilities to (1) notify the appropriate local Native American Tribes of any proposed dispositions of utility-owned real property that are subject to Section 851 and (2) to allow 90 days for the Tribes to respond as to their interest in purchasing the subject real property.

PG&E has agreed to grant this Easement, conditional to Commission approval, to grant land rights to DWR to complete the necessary safety work. Therefore, the proposed transfer to DWR is in the interest of public safety. Because PG&E understands the intent of the Policy to be the return of the Tribal sacred places and cultural resources to the appropriate Tribes, PG&E is serving this advice letter on the Native American Tribes who may also have knowledge of cultural resources in the project area as identified by the Native American Heritage Commission (NAHC). The names of the Tribes provided by the NAHC are included as Attachment 6.

⁵ As stated in Attachment 5, Environmental Assessment, Section 7.1, "Conclusions."

For the above reasons, the Commission should approve this Section 851 request to execute the Easement and find that doing so is not adverse to the public interest because it will not impair PG&E's provision of utility service.

(a) Identity and Addresses of All Parties to the Proposed Transaction:

Pacific Gas and Electric Company	State of California, Department of Water
Attn: Molly Zimney	Resources
Law Department	Attention: Kacy Kimball
P.O. Box 7442	1416 Ninth Street, Room 425
San Francisco, CA 94120	Sacramento, CA 95814
Telephone: (415) 973-8794	Telephone: (916) 654-4422
Facsimile: (415) 973-9741	Kacy.Kimball@water.ca.gov
Email: Molly.Zimney@pge.com	

(b) Complete Description of the Property Including Present Location, Condition and Use:

The Property (Assessor's Parcel Numbers (APN) 033-010-055 and 069-010-019, approximately 236.42 acres in total) is located in unincorporated Butte County, approximately 1 mile southwest of the Oroville Dam Spillway. The Property currently houses portions of PG&E's Table Mountain-Palermo 230kV, Table Mountain-Rio Oso 230kV, and Palermo-Oroville #2 60kV Electric Transmission lines. These PG&E facilities pass through the proposed Easement Area on APN 033-010-055, and are located generally parallel to the relocated DWR transmission lines (two lines of towers) for approximately 0.5 mile through the parcel. PG&E's Palermo-Oroville #2 60kV Electric Transmission line is located within APN 069-010-019, but does not intersect with the proposed Easement Area.

DWR currently has its Oroville-Table Mountain facilities relocated on the Property in a portion of the Easement area.

(c) Intended Use of the Property:

The proposed Easement would grant DWR permission to occupy the Property to construct, operate and maintain the Oroville-Table Mountain Facilities, the Feeder Cable and the Fiber Optic System in the Easement areas.

(d) Complete Description of Financial Terms of the Proposed Transaction:

PG&E will receive a one-time fee of \$80,300.00 for granting the easement.

(e) Description of How Financial Proceeds of the Transaction Will Be Distributed:

PG&E will account for this one-time fee as Electric Other Operating Revenue.

(f) Statement on the Impact of the Transaction on Ratebase and Any Effect on the Ability of the Utility to Serve Customers and the Public:

There are no changes to PG&E's rate base as a result of granting the proposed easement.

(g) The Original Cost, Present Book Value, and Present Fair Market Value for Sales of Real Property and Depreciable Assets, and a Detailed Description of How the Fair Market Value Was Determined (e.g., Appraisal):

Not applicable.

(h) The Fair Market Rental Value for Leases of Real Property, and a Detailed Description of How the Fair Market Rental Value Was Determined:

Not Applicable.

(i) The Fair Market Value of the Easement or rights of way and a Detailed Description of How the Fair Market Value Was Determined:

The fair market value of the Easement of \$80,300 was determined by an appraisal by using comparable recent sales of similar property in the locality. The appraisal was performed by Bender Rosenthal Incorporated, dated February 9, 2018.

(j) A Complete Description of any Recent Past (Within the Prior Two Years) or Anticipated Future Transactions that May Appear to Be Related to the Present Transaction:

There are no recent past or anticipated future transactions that are related to the present transaction.

(k) Sufficient Information and Documentation (Including Environmental Information) to Show that All of Eligibility Criteria Set Forth in Rule 3 of General Order 173 are Satisfied:

PG&E has provided information in this Advice Letter to satisfy the eligibility criteria under General Order 173 in that:

- The activity proposed in the transaction will not require environmental review by the CPUC as a Lead Agency;
- The transaction will not have an adverse effect on the public interest or on the ability of PG&E to provide safe and reliable service to its customers at reasonable rates;
- The transaction will not materially impact the rate base of PG&E; and
- The transaction does not warrant a more comprehensive review that would be provided through a formal Section 851 application.

(l) Additional Information to Assist in the Review of the Advice Letter:

No other information is available other than what has already been included within this advice letter filing.

(m) Environmental Information

Pursuant to General Order 173, the Advice Letter program applies to proposed transactions that will not require environmental review by the CPUC as a lead agency under the California Environmental Quality Act ("CEQA") either because: (a) a statutory or categorical exemption applies (the applicant must provide a Notice of Exemption from the Lead Agency or explain why an exemption applies), or (b) because the transaction is not a project under CEQA (the applicant must explain the reasons why it believes that the transaction is not a project), or (c) because another public agency, acting as the Lead Agency under CEQA, has completed environmental review of the project, and the Commission is required to perform environmental review of the project only as a Responsible Agency under CEQA.

The CPUC is not required to undertake environmental review under CEQA because all physical changes within the proposed easement are statutorily or categorically exempt from CEQA. PG&E is proposing to grant an easement to DWR for construction, operation and maintenance of transmission line facilities that were recently built under emergency conditions prior to obtaining the easement. This construction by DWR was the subject of an Environmental Assessment prepared by FERC Staff to fulfill the requirements of the National Environmental Policy Act (NEPA), which concluded that the no-action alternative – leaving the temporary transmission line in place indefinitely across the uphill portions of the damaged spillways – was not feasible, but that any minor adverse effects to terrestrial, cultural, and recreation resources would be offset with the implementation of protective measures. (Sections 7.1 thru 7.3, Environmental Assessment, Attachment 5.)

Although DWR's transmission line relocation has a total length of 11,000 feet, the portion crossing PG&E's fee property is only 3,500 feet. Under California law, this relocation would qualify under Section 15269 (b) or (c) as an emergency project

statutorily exempt from CEQA. Section 15269 (b) provides an exemption for “[e]mergency repairs to publicly or privately-owned service facilities necessary to maintain service essential to the public health, safety or welfare.” Section 15269 (c) exempts “[s]pecific actions necessary to prevent or mitigate an emergency.” Based on the information provided in the Environmental Assessment, either of these exemptions would apply to the segment of line on PG&E property. The existing transmission lines, needed to transmit power from the Hyatt Pumping-Generating Plant, crossed the face of the dam and were damaged by flooding caused by unusually heavy rains. The permanent reroute of the transmission line facilities was necessary to facilitate access to and repair of the damaged sites, and to prevent future damage to the transmission lines by moving them away from the spillway paths.

The planned relocation of the underground 13.8kV power lines and fiber optic cable is also exempt from CEQA. These activities, which will happen after the easement has been granted, are categorically exempt from CEQA under CEQA Guidelines sections 15304 (f) and 15303. One trench will be installed within the new easement area, for the fiber optic cables and power cables, starting at GPS coordinates -121.507388510, 39.535097120 and -121.507388510, 39.535097120, respectively. The trench will hold four conduits, one for each of the cables, plus two spare conduits. One end of the trench will extend north from the pull boxes for approximately 1,200 feet, and the other end of the trench will extend southeast for approximately 1,500 feet. The trench will follow existing dirt roads or walk trails.

Installing the cables in trenches is categorically exempt under CEQA Guidelines section 15304 (f), minor alterations to land “which do not involve removal of healthy, mature, scenic trees” and include “minor trenching and backfilling where the surface is restored.” No scenic trees are being uprooted for this project, as the trenching will follow existing dirt roads and the area was previously cleared of trees. The trenches will be with a minimum depth of 30” and approximately 18” to 22” wide. The conduit will be encased in concrete or slurry. The top 12” of the trench will be backfilled with natural soil to match the terrain. These facts clearly establish the CEQA exemption. In D.08-04-018 (Current Communications), the Commission observed that “underground installations of up to five miles per project segment shall be considered to be categorically exempt under [sections 15303 and 15304].” (See D.08-04-018 at 5-6.)

The pull boxes are also categorically exempt under CEQA Guidelines section 15303, construction of new, small facilities or structures. Installing these pull boxes and underground cables along dirt roads within the easement area requires construction that is much less intrusive than that required to install a transmission line, which the Environmental Assessment concluded would have less than significant impacts. There are no known exceptions to the exemptions under Guidelines section 15300.2 that would disqualify the categorical

exemptions discussed above and there is no reasonable possibility that the project could have a significant impact on the environment.

Protests

*****Due to the COVID-19 pandemic and the shelter at home orders, PG&E is currently unable to receive protests or comments to this advice letter via U.S. mail or fax. Please submit protests or comments to this advice letter to EDTariffUnit@cpuc.ca.gov and PGETariffs@pge.com*****

Anyone wishing to protest this submittal may do so by sending a letter by July 1, 2020, which is 30 days from the date of this submittal. The protest must state the grounds upon which it is based, including such items as financial and service impact, and should be submitted expeditiously. Protests should be mailed to:

CPUC Energy Division
ED Tariff Unit
505 Van Ness Avenue, 4th Floor
San Francisco, California 94102

Facsimile: (415) 703-2200
E-mail: EDTariffUnit@cpuc.ca.gov

Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest shall also be sent to PG&E either via E-mail or U.S. mail (and by facsimile, if possible) at the address shown below on the same date it is mailed or delivered to the Commission:

Erik Jacobson
Director, Regulatory Relations
c/o Megan Lawson
Pacific Gas and Electric Company
77 Beale Street, Mail Code B13U
P.O. Box 770000
San Francisco, California 94177

Facsimile: (415) 973-3582
E-mail: PGETariffs@pge.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter (General Order 96-B, Section 7.4). The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name, telephone number, postal

address, and (where appropriate) e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

Effective Date

PG&E requests that this Tier 2 advice submittal become effective on regular notice, July 11, 2020 which is 30 calendar days after the date of submittal.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and/or via U.S. mail to parties shown on the attached list. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter submittals can also be accessed electronically at: <http://www.pge.com/tariffs>.

 /S/

Erik Jacobson
Director, Regulatory Relations

Attachment 1 – Easement Agreement
Attachment 2 – OER Resources Report
Attachment 3 – Bender Rosenthal Inc. Appraisal
Attachment 4 – Initial FERC Filing
Attachment 5 – Environmental Assessment
Attachment 6 – Names of the Tribes provided by the NAHC

***** **SERVICE LIST for Advice 5847-E** *****
APPENDIX A

Jonathan Reiger
Legal Division
505 Van Ness Avenue
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(415) 355-5596
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Mary Jo Borak
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Andrew Barnsdale
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(415) 703-3221
bca@cpuc.ca.gov

Butte County Clerk Recorder
155 Nelson Ave
Oroville, CA 95965
recorders@buttecounty.net

State of California, Department of Water Resources
Attention: Senior Right of Way Agent
1416 Ninth Street, Room 425
Sacramento, CA 95814
Telephone: (916) 654-4422
Kacy.Kimball@water.ca.gov

***Berry Creek Rancheria of Maidu
Indians***

Francis Steele, Chairperson
5 Tyme Way
Oroville, CA, 95966
Phone: (530) 534 - 3859
Fax: (530) 534-1151
fsteele@berrycreekrancheria.com
Maidu

***Estom Yumeka Maidu Tribe of
the Enterprise Rancheria***

Glenda Nelson, Chairperson
2133 Monte Vista Avenue
Oroville, CA, 95966
Phone: (530) 532 - 9214
Fax: (530) 532-1768
info@enterpriserancheria.org
Maidu

***Greenville Rancheria of Maidu
Indians***

Kyle Self, Chairperson
P.O. Box 279
Greenville, CA, 95947
Phone: (530) 284 - 7990
Fax: (530) 284-6612
kself@greenvillerrancheria.com
Maidu

KonKow Valley Band of Maidu

Jessica Lopez, Chairperson
2086 N. Villa St.
Palermo, CA, 95968
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jessica@konkowmaidu.org
KonKow
Maidu

Mechoopda Indian Tribe

Dennis Ramirez, Chairperson
125 Mission Ranch Blvd
Chico, CA, 95926
Phone: (530) 899 - 8922
Fax: (530) 899-8517
dramirez@mechoopda-nsn.gov
KonKow
Maidu

**Mooretown Rancheria of Maidu
Indians**

Benjamin Clark, Chairperson
#1 Alverda Drive
Oroville, CA, 95966
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frontdesk@mooretown.org
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Guy Taylor,
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Maidu

Tsi Akim Maidu

Grayson Coney, Cultural Director
P.O. Box 510
Browns Valley, CA, 95918
Phone: (530) 383 - 7234
tsi-akim-maidu@att.net
Maidu

**United Auburn Indian
Community of the Auburn
Rancheria**

Gene Whitehouse, Chairperson
10720 Indian Hill Road
Auburn, CA, 95603
Phone: (530) 883 - 2390
Fax: (530) 883-2380
bguth@auburnrancheria.com
Maidu
Miwok



ADVICE LETTER SUMMARY

ENERGY UTILITY



MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Pacific Gas and Electric Company (ID U39 E)

Utility type:

- ELC GAS WATER
 PLC HEAT

Contact Person: Annie Ho
 Phone #: (415) 973-8794
 E-mail: PGETariffs@pge.com
 E-mail Disposition Notice to: AMHP@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
 PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 5847-E

Tier Designation: 2

Subject of AL: Grant of Easement to California Department of Water Resources for Relocation Work Related to the Oroville Spillway Incident – Request for Approval under Public Utilities Code Section 851 and General Order 173

Keywords (choose from CPUC listing): Agreements, Section 851

AL Type: Monthly Quarterly Annual One-Time Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #:

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? Yes No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? Yes No

Requested effective date: 7/11/20

No. of tariff sheets: N/A

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected:

Service affected and changes proposed¹: N/A

Pending advice letters that revise the same tariff sheets: N/A

¹Discuss in AL if more space is needed.

Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102
Email: EDTariffUnit@cpuc.ca.gov

Name: Erik Jacobson, c/o Megan Lawson
Title: Director, Regulatory Relations
Utility Name: Pacific Gas and Electric Company
Address: 77 Beale Street, Mail Code B13U
City: San Francisco, CA 94177
State: California Zip: 94177
Telephone (xxx) xxx-xxxx: (415)973-2093
Facsimile (xxx) xxx-xxxx: (415)973-3582
Email: PGETariffs@pge.com

Name:
Title:
Utility Name:
Address:
City:
State: District of Columbia Zip:
Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email:

Attachment 1

Easement Agreement

LD 2119-04-1694
JCN: 06-17-010
DWR Easement (Oroville-Table Mtn 230kV)
RECORDING REQUESTED BY, AND
WHEN RECORDED RETURN TO:

PACIFIC GAS AND ELECTRIC COMPANY
245 Market Street, N10A, Room 1015
P.O. Box 770000
San Francisco, California 94177

Location: County of Butte
Recording Fee \$__0.00_____
Document Transfer Tax \$ ____0.00_____
o Computed on Full Value of Property Conveyed, or
o Computed on Full Value Less Liens &
Encumbrances Remaining at Time of Sale

Signature of declarant or agent determining tax

(A portion of APN 033-010-055 & 069-010-019)

**EASEMENT AGREEMENT
(Electric Transmission 230kV)**

This Easement Agreement (“**Agreement**”) is made and entered into this _____ day of _____, 20__ (the “**Effective Date**”) by PACIFIC GAS AND ELECTRIC COMPANY, a California corporation, hereinafter called “**PG&E**”, and the STATE OF CALIFORNIA, acting by and through its Department of Water Resources, hereinafter called “**Grantee**.”

RECITALS

A. PG&E owns certain real property within the County of Butte, State of California, commonly known as Assessor’s Parcel Numbers 033-010-055 & 069-010-019, State Board of Equalization Numbers 135-4-65E-4 & 135-4-65E-3, and more particularly described in **Exhibit A**, attached hereto and made a part hereof (hereinafter, the “**Property**”).

B. Grantee has rerouted its Oroville – Table Mountain 230kV tower lines and two (2) associated underground electric and communication conduits onto the Property, the construction of which was performed as an emergency action in response to the 2017 Lake Oroville Dam spillway failures.

C. Grantee has requested that PG&E grant an easement for the construction, and on-going maintenance and operation of the facilities. PG&E is willing to grant such easement on the terms and subject to the conditions set forth herein.

Now, therefore, for good and valuable consideration, PG&E and Grantee agree as follows:

1. Grant of Easement: PG&E hereby grants to Grantee, upon the terms and conditions set forth in this Agreement, the following easement:

(a) A non-exclusive right to construct, install, suspend, repair, replace, remove, maintain and use two (2) 230kV electrical transmission lines, each consisting of wires and cables suspended from poles, towers, or other structures; and two (2) underground conduits, pipes, manholes, service boxes, wires, cables and other electrical conductors; aboveground marker posts, risers and service pedestals; underground and aboveground switches, fuses, terminals and transformers with associated concrete pads; and fixtures and appurtenances necessary to any thereof, for the transmission of electric energy and communication purposes; all within the portion of the Property (the “**Easement Area**”) described in **Exhibit B** attached hereto and made a part hereof.

(b) The right, from time to time, to trim or to cut down any and all trees and brush now or hereafter within said easement area which now or hereafter in the opinion of Grantee may interfere with or be a hazard to the facilities installed hereunder, or as Grantee deems necessary to comply with applicable state or federal regulations;

(c) A non-exclusive right of surface access, ingress and egress to and from Grantee’s facilities within the Easement Area, over and across the portion of the Property on which PG&E has constructed private roads and lanes thereon, if such there be, otherwise upon written request from Grantee, by such routes as PG&E determines, in its reasonable discretion, will occasion the least practicable damage and inconvenience to PG&E and its facilities.

2. Limitations on Use.

(a) The Easement Area, and any facilities permitted to be constructed thereon, are to be used by Grantee only for those uses permitted in Section 1 above, and for no other purpose.

(b) PG&E reserves the right to restrict access to the Easement Area or any portion or portions thereof in the event of fire, earthquake, storm, riot, civil disturbance, or other casualty or emergency, or in connection with PG&E’s response thereto, or if emergency repairs or maintenance are required to PG&E facilities within or in the vicinity of the Easement Area, or otherwise when PG&E deems it advisable to do so, including in connection with events and emergencies occurring or affecting PG&E’s business operations located elsewhere than in the immediate vicinity of the Property.

(c) This Agreement does not authorize the interconnection of Grantee’s facilities with PG&E’s facilities, which interconnection would be the subject of one or more separate written agreements between the parties, including, but not limited to, a Generator Interconnection Agreement and/or a retail power purchase agreement.

3. Condition of Easement Area. Grantee accepts the Easement Area in its existing physical condition, without warranty by PG&E or any duty or obligation on the part of PG&E to maintain the Easement Area. Grantee acknowledges that one or more of the following

(collectively, “**Potential Environmental Hazards**”) may be located in, on or underlying the Property and/or the Easement Area:

(a) electric fields, magnetic fields, electromagnetic fields, electromagnetic radiation, power frequency fields, and extremely low frequency fields, however designated, and whether emitted by electric transmission lines, other distribution equipment or otherwise (“**EMFs**”);

(b) Hazardous Substances (as hereinafter defined). For purposes hereof, the term “**Hazardous Substances**” means any hazardous or toxic material or waste which is or becomes regulated by Legal Requirements (as hereinafter defined) relating to the protection of human health or safety, or regulating or relating to industrial hygiene or environmental conditions, or the protection of the environment, or pollution or contamination of the air, soil, surface water or groundwater, including, but not limited to, laws, requirements and regulations pertaining to reporting, licensing, permitting, investigating and remediating emissions, discharges, releases or threatened releases of such substances into the air, surface water, or land, or relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of such substances. Without limiting the generality of the foregoing, the term Hazardous Substances includes any material or substance:

(1) now or hereafter defined as a “hazardous substance,” “hazardous waste,” “hazardous material,” “extremely hazardous waste,” “restricted hazardous waste” or “toxic substance” or words of similar import under any applicable local, state or federal law or under the regulations adopted or promulgated pursuant thereto, including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §§9601 et seq. (“CERCLA”); the Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§6901 et seq.; the Clean Air Act, 42 U.S.C. §§7401 et seq.; the Clean Water Act, 33 U.S.C. §§1251 et seq.; the Toxic Substance Control Act, 15 U.S.C. §§2601 et seq.; the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§136 et seq.; the Atomic Energy Act of 1954, 42 U.S.C. §§2014 et seq.; the Nuclear Waste Policy Act of 1982, 42 U.S.C. §§10101 et seq.; the California Hazardous Waste Control Law, Cal. Health and Safety Code §§25100 et seq.; the Porter-Cologne Water Quality Control Act, Cal. Water Code §§13000 et seq.; the Carpenter-Presley-Tanner Hazardous Substance Account Act (Health and Safety Code §§25300 et seq.); and the Medical Waste Management Act (Health and Safety Code §§25015 et seq.); or

(2) which is toxic, explosive, corrosive, flammable, infectious, radioactive, carcinogenic, mutagenic or otherwise hazardous, and is now or hereafter regulated as a Hazardous Substance by the United States, the State of California, any local governmental authority or any political subdivision thereof, or which cause, or are listed by the State of California as being known to the State of California to cause, cancer or reproductive toxicity; or

(3) the presence of which on the Property poses or threatens to pose a hazard to the health or safety of persons on or about the Property or to the environment; or

(4) which contains gasoline, diesel fuel or other petroleum hydrocarbons; or

(5) which contains lead-based paint or other lead contamination, polychlorinated biphenyls (“PCBs”) or asbestos or asbestos-containing materials or urea formaldehyde foam insulation; or

(6) which contains radon gas;

(c) fuel or chemical storage tanks, energized electrical conductors or equipment, or natural gas transmission or distribution pipelines; and

(d) other potentially hazardous substances, materials, products or conditions.

Grantee shall be solely responsible for the health and safety of, and shall take all necessary precautions to protect, its employees, contractors, consultants, agents and invitees (“**Grantee’s Representatives**”) from risks of harm from Potential Environmental Hazards. Grantee acknowledges that it has previously evaluated the condition of the Easement Area and all matters affecting the suitability of the Easement Area for the uses permitted by this Agreement, including, but not limited to, the Potential Environmental Hazards listed herein.

4. Grantee’s Covenants. Grantee hereby covenants and agrees:

(a) Construction of Improvements. Grantee agrees to construct, maintain, and operate, at no cost to PG&E, such facilities and improvements that have been constructed, and those being proposed for construction (“**Improvements**”) as may be necessary and appropriate for Grantee’s permitted use, as specified in Section 1. All additional construction shall be performed in accordance with detailed plans and specifications (“**Plans**”) previously approved by PG&E and shall comply with all Legal Requirements. Before commencing any additional construction of any Improvements, Grantee shall obtain all permits, authorizations or other approvals, at Grantee’s sole cost and expense as may be necessary for such construction. Without limiting the generality of the foregoing, Grantee shall be responsible for complying with any and all applicable requirements of the National Environmental Policy Act (“**NEPA**”) and the California Environmental Quality Act (“**CEQA**”) and satisfying, at Grantee’s sole expense, any and all mitigation measures under CEQA that may apply to Grantee’s proposed occupancy and use of the Easement Area, and to the construction, maintenance and use of Grantee’s proposed Improvements and facilities. Grantee shall promptly notify PG&E of any and all proposed mitigation measures that may affect PG&E or the Property. If PG&E determines in good faith that any such mitigation measures may adversely affect PG&E or the Property, or impose limitations on PG&E’s ability to use the Property as specified in Section 7, then PG&E shall have the right, without liability to Grantee, to give notice of termination of this Agreement to Grantee, whereupon this Agreement and the rights granted to Grantee shall terminate and revert in PG&E, unless within ten (10) days following delivery of such notice, Grantee gives notice to PG&E by which Grantee agrees to modify its proposed Project (as that term is defined under CEQA) so as to eliminate the necessity for such mitigation measures. In the event of such termination, PG&E and Grantee shall each be released from all obligations under this Agreement, except those which expressly survive termination. Grantee acknowledges and agrees that PG&E’s review of Grantee’s Plans is solely for the purpose of protecting PG&E’s interests, and shall not be deemed to create any liability of any kind on the part of PG&E, or to constitute a representation on the part of PG&E or any person consulted by PG&E in connection with such review that the Plans or the Improvements contemplated by such Plans are adequate or

appropriate for any purpose, or comply with applicable Legal Requirements. Grantee shall not commence additional construction or installation of any Improvements without the prior written consent of PG&E, which consent shall not be unreasonably withheld, conditioned or delayed, and the prior consent, to the extent required by applicable law or regulation, of the California Public Utilities Commission (hereinafter, “CPUC”);

(b) Compliance with Laws. Grantee shall, at its sole cost and expense, promptly comply with (a) all laws, statutes, rules, regulations, requirements or orders of state, and federal authorities now in force or that may later be in force, including, but not limited to, those relating to the generation, use, storage, handling, treatment, transportation or disposal of Hazardous Substances, as defined herein, or to health, safety, noise, environmental protection, air quality or water quality; (b) the conditions of any permit, occupancy certificate, license or other approval issued by public officers relating to Grantee’s use or occupancy of the Easement Area; and (c) with any liens, encumbrances, easements, covenants, conditions, restrictions and servitudes (if any) of record, or of which Grantee has notice, which may be applicable to the Easement Area (collectively, “**Legal Requirements**”), regardless of when they become effective, insofar as they relate to the use or occupancy of the Easement Area by Grantee. Grantee shall furnish satisfactory evidence of such compliance upon request by PG&E. The judgment of any court of competent jurisdiction, or the admission of Grantee in any action or proceeding against Grantee, whether or not PG&E is a party in such action or proceeding, that Grantee has violated any Legal Requirement relating to the use or occupancy of the Easement Area, shall be conclusive of that fact as between PG&E and Grantee.

(c) Notice of Enforcement Proceedings. Grantee agrees to notify PG&E in writing within three (3) business days of any investigation, order or enforcement proceeding which in any way relates to the Property, or to any contamination or suspected contamination on, within or underlying the Property. Such notice shall include a complete copy of any order, complaint, agreement, or other document which may have been issued, executed or proposed, whether draft or final;

(d) Non-Interference. Grantee agrees not to interfere in any way or permit any interference with the use of the Property by PG&E and other entitled persons. Interference shall include, but not be limited to, any activity by Grantee that places any of PG&E’s gas or electric facilities in violation of any of the provisions of General Order Nos. 95 (Overhead Electric), 112 (Gas), and 128 (Underground Electric) of the CPUC or to any other Legal Requirements under which the operations of utility facilities are controlled or regulated. Grantee shall not erect, handle, or operate any tools, machinery, apparatus, equipment, or materials closer to any of PG&E’s high-voltage electric conductors than the minimum clearances set forth in the High-Voltage Electrical Safety Orders of the California Division of Industrial Safety; which minimum clearances are incorporated herein by reference; but in no event closer than ten (10) feet to any energized electric conductors or appliances. Grantee shall not drill, bore, or excavate within thirty (30) feet of any of PG&E’s underground facilities, including, but not limited to, gas pipelines, valves, regulators or electric conduits. Grantee shall provide notice to Underground Service Alert at 1-800-227-2600 at least two (2) business days prior to commencing any drilling, boring or excavating permitted hereunder to assist Grantee with locating any and all underground facilities, including, but not limited to, gas pipelines, valves, regulators or electric conduits;

(e) Avoiding Dangerous Activities. Grantee agrees to conduct its activities and operations within and on the Easement Area in such a manner so as not to endanger the Property, PG&E's utility facilities, the environment and human health and safety. Grantee shall not cause or permit any Hazardous Substances, as defined herein, to be brought upon, produced, stored, used, discharged or disposed of on, or in the vicinity of the Property, except in compliance with all applicable Legal Requirements. Grantee shall be responsible for the cost of remediating any discharge or release of Hazardous Substances resulting from or arising in connection with Grantee's use of the Property, and shall immediately notify PG&E and the appropriate regulatory authorities where required by law, of any such release. If PG&E determines that Grantee's activities in any way endanger the Property, PG&E's utility facilities, the environment, or human health and safety, PG&E may, in PG&E's sole and absolute discretion, require that Grantee halt such activities until appropriate protective measures are taken to PG&E's satisfaction. Grantee shall hold PG&E harmless from any claims resulting from any delay under this paragraph. PG&E's right to halt activities under this paragraph shall not in any way affect or alter Grantee's insurance or indemnity obligations under this Agreement, nor shall it relieve Grantee from any of its obligations hereunder that pertain to health, safety, or the protection of the environment;

(f) Maintenance. Grantee agrees to maintain its facilities and Improvements in good condition and repair, and be responsible for the security of, the facilities installed hereunder;

(g) Repairing Damage. Grantee agrees to repair any damage it may cause to PG&E's facilities and improvements in or around said Easement Area;

(h) Coordination. Grantee agrees to coordinate all activities regarding the easements granted herein to reasonably minimize any interference and inconvenience with the use by PG&E of the Easement Area and PG&E's adjoining lands;

(i) Fencing.

(1) Grantee agrees not to fence or enclose the Easement Area (except that Grantee may, with PG&E's permission, and Grantee will, upon PG&E's request, whenever construction work is being performed on, over or about the Easement Area, erect and maintain a temporary fence to surround and secure the area in which such work is being performed); and

(2) Grantee may, with PG&E's permission, install gates to restrict third party access over said roads, provided a PG&E lock is installed to allow unrestricted access to PG&E.

(j) PG&E Right to Cure. Grantee agrees that if Grantee fails to perform any act or other obligation on its part to be performed hereunder, and such failure is not remedied within fifteen (15) days following notice from PG&E (or in the case of an emergency, following such notice, if any, as may be reasonably practicable under the existing circumstances), PG&E may (but without obligation to do so, and without waiving or releasing Grantee from any of its obligations) perform any such act or satisfy such obligation, or otherwise remedy such emergency or such failure on the part of Grantee. All costs incurred by PG&E in responding to or remedying such failure by Grantee shall be payable by Grantee to PG&E on demand.

5. Indemnification; Release.

(a) Grantee shall, to the maximum extent permitted by law, indemnify, and hold harmless PG&E, and its respective officers, managers, directors, employees successors and assigns (each, an “**Indemnitee**” and collectively, “**Indemnitees**”) from and against all claims, losses (including, but not limited to, diminution in value), actions, demands, damages, costs, expenses (including, but not limited to, experts fees and reasonable attorneys’ fees and costs) and liabilities of whatever kind or nature (collectively, “**Claims**”), which arise from use of the Easement Area by Grantee or Grantee’s Representatives, or the exercise by Grantee of its rights hereunder, or the performance of, or failure to perform, Grantee’s duties under this Agreement, including, but not limited to, Claims arising out of: (1) injury to or death of persons, including but not limited to employees of PG&E or Grantee (and including, but not limited to, injury due to exposure to EMFs and other Potential Environmental Hazards in, on or about the Property); (2) injury to property or other interest of PG&E, Grantee or any third party; (3) violation of any applicable federal, or state, laws, statutes, or regulations, , including all Legal Requirements relating to human health or the environment, and including any liability which may be imposed by law or regulation; excepting only with respect to any Indemnitee, to the extent of any Claim arising from the sole negligence or willful misconduct of such Indemnitee. Without limiting the generality of the foregoing, Grantee shall, to the maximum extent permitted by law, indemnify, and hold Indemnitees harmless from and against Claims arising out of or in connection with any work of improvement constructed or installed at or on, labor performed on, or materials delivered to, or incorporated in any improvements constructed on, the Easement Area by, or at the request or for the benefit of, Grantee.

(b) Grantee’s use of the Property shall be at its sole risk and expense. Grantee accepts all risk relating to its occupancy and use of the Easement Area. PG&E shall not be liable to Grantee for, and Grantee hereby waives and releases PG&E and the other Indemnitees from, any and all liability, whether in contract, tort or on any other basis, for any injury, damage, or loss resulting from or attributable to any occurrence on or about the Easement Area, the condition of Easement Area, or the use or occupancy of the Easement Area.

(c) Grantee shall, to the maximum extent permitted by law, indemnify, and hold Indemnitees harmless against claims, losses, costs (including, but not limited to, attorneys’ fees and costs), liabilities and damages resulting from the failure of Grantee, or any of its contractors or subcontractors, to comply with the insurance requirements set forth in **Exhibit C**, attached hereto and made a part hereof. If Grantee fails to so indemnify, or hold harmless any Indemnitee, then at PG&E’s option, this Agreement shall terminate, and the estate and interest herein granted to Grantee shall revert to and revest in PG&E, if such failure continues for five (5) days following the giving of written notice of termination to Grantee, unless within such time such failure is cured to the reasonable satisfaction of PG&E.

(d) The provisions of this Section 5 shall survive the termination of this Agreement.

6. Additional Facilities. Grantee shall not install any additional facilities or improvements in, on, under or over the Easement Area without the prior written consent of PG&E, which consent may be granted or withheld in PG&E’s sole and absolute discretion, and the prior

consent, to the extent required by applicable law or regulation, of the CPUC. Grantee shall submit plans for installation of any proposed additional facilities within the Easement Area to PG&E for its written approval at the address specified in Section 12.

7. Reserved Rights. Subject to the provisions of Section 9 below, PG&E reserves the right to use the Easement Area for any and all purposes which will not unreasonably interfere with Grantee's facilities. Without limiting the generality of the foregoing:

(a) PG&E reserves the right to make use of the Easement Area for such purposes as it may deem necessary or appropriate if, and whenever, in the interest of its service to its patrons or consumers or the public, it shall appear necessary or desirable to do so.

(b) Grantee acknowledges that PG&E may have previously granted, and may in the future grant, certain rights in and across the Easement Area to others, and the use of the word "grant" in this Agreement shall not be construed as a warranty or covenant by PG&E that there are no such other rights.

(c) Grantee shall not make use of the Easement Area in any way which will endanger human health or the environment, create a nuisance or otherwise be incompatible with the use of the Easement Area, the Property, or PG&E's adjacent property, by PG&E or others entitled to use such property.

(d) This grant is made subject to all applicable provisions of General Order No. 95 (Overhead Electric), General Order 112 (Gas) and General Order No. 128 (Underground Electric) of the CPUC, in like manner as though said provisions were set forth herein.

8. Governmental Approvals. This Agreement shall not become effective, notwithstanding that it may have been executed and delivered by the parties, and Grantee shall not commence additional construction or other activities hereunder, unless and until the CPUC approves this Agreement and the easements granted and other transactions contemplated hereby (including the adequacy of the compensation to be paid by Grantee), by an order which is final, unconditional and unappealable (including exhaustion of all administrative appeals or remedies before the CPUC). Grantee further acknowledges and agrees that PG&E makes no representation or warranty regarding the prospects for CPUC approval, and Grantee hereby waives all Claims against PG&E which may arise out of the need for such CPUC approval or the failure of the CPUC to grant such approval. This Agreement is made subject to all the provisions of such approval, as more particularly set forth in CPUC (Disposition Letter Advice Letter Decision ___- _____), in like manner as though said provisions were set forth in full herein.

9. Relocation. Subject to the provisions of this Section 9, the rights granted to Grantee herein shall forever be subordinate to PG&E's right to replace, reconstruct, relocate, operate and maintain PG&E's existing and/or future facilities, including, but not limited to, PG&E's existing electrical transmission lines which traverse the Property. If PG&E's use of its reserved rights described above necessitates the relocation of any of Grantee's facilities, Grantee shall, at its own cost and expense, relocate such facilities to an alternate location mutually agreed upon between PG&E and Grantee, provided Grantee is given at least twenty (20) days prior written notice of such required relocation. Any such relocation of Grantee's facilities shall be coordinated and scheduled

between PG&E and Grantee so as to minimize, to the extent practicable, any interference with Grantee's use and operation of its facilities resulting from such relocation. If no alternate location is available on the Property, this Agreement shall terminate.

10. Compliance; Insurance. PG&E shall have a right to access and inspect the Easement Area at any time to confirm Grantee's compliance with Legal Requirements and the provisions of this Agreement. Prior to the Effective Date of this Agreement, Grantee shall procure, and thereafter Grantee shall carry and maintain in effect at all times during the term of the Agreement, with respect to the Easement Area and the use, occupancy and activities of Grantee, its employees and agents on or about the Easement Area, the insurance specified in **Exhibit C**, attached hereto and made a part hereof by this reference, provided that PG&E reserves the right to review and modify from time to time the coverages and limits of coverage required hereunder, as well as the deductibles and/or self-insurance retentions in effect from time to time (but PG&E agrees that it will not increase required coverage limits more often than once in any five-year period). Prior to Grantee's entry on the Property, and thereafter thirty (30) days prior to the expiration date of any policy, Grantee shall provide PG&E with evidence of the insurance coverage, or continuing coverage, as required by this Agreement. All insurance required under this Agreement shall be effected under valid, enforceable policies issued by insurers of recognized responsibility, as reasonably determined by PG&E, and shall be written on forms and with insurance carriers acceptable to PG&E. Grantee is also responsible for causing its agents, contractors and subcontractors to comply with the insurance requirements of this Agreement at all relevant times (provided, however, that Grantee, in the exercise of its reasonable judgment, may permit contractors and subcontractors to maintain coverages and limits lower than those required of Grantee, provided the coverages and limits required by Grantee are commercially reasonable in light of applicable circumstances). Any policy of liability insurance required to be maintained hereunder by Grantee may be maintained under a so-called "blanket policy" insuring other locations and/or other persons, so long as PG&E is specifically named as an additional insured under such policy and the coverages and amounts of insurance required to be provided hereunder are not thereby impaired or diminished. In addition, liability insurance coverages may be provided under single policies for the full limits, or by a combination of underlying policies with the balance provided by excess or umbrella liability insurance policies.

For so long as Grantee (a) is an agency or instrumentality of the United States of America, the State of California or any political subdivision thereof, or (b) is a public utility (as that term is defined in the California Public Utilities Code), or (c) maintains a net worth (measured in accordance with generally accepted accounting principles applicable to public utility companies) not less than twenty (20) times the limit of liability (per-occurrence) from time to time required hereunder for Grantee's Commercial General Liability Insurance coverage (or if such coverage is no longer available, its replacement); then Grantee may elect to self-insure for any or all of the required coverage. If Grantee is permitted to self-insure hereunder and elects to do so, Grantee shall be liable to PG&E for the full equivalent of insurance coverage which would have been available to PG&E if all required insurance policies had been obtained by Grantee from a third party insurer, in the form required by this Agreement, and shall pay on behalf of or indemnify PG&E for all amounts which would have been payable by the third party insurer. In addition, Grantee shall act with the same promptness and subject to the same standards of good faith as would apply to a third party insurance company.

11. Mechanics' Liens. Grantee shall keep the Property free and clear of all mechanics', material suppliers' or similar liens, or claims thereof, arising or alleged to arise in connection with any work performed, labor or materials supplied or delivered, or similar activities performed by Grantee or at its request or for its benefit. If any mechanics' liens are placed on the Property in connection with the activities or facilities set forth in this Agreement, Grantee shall promptly cause such liens to be released and removed from title, either by payment or by recording a lien release bond in the manner specified in California Civil Code Section 3143 or any successor statute.

12. Notice. Any notices or communications hereunder shall be in writing and shall be personally delivered or sent by first class mail, certified or registered, postage prepaid, or sent by national overnight courier, with charges prepaid for next business day delivery, addressed to the addressee party at its address or addresses listed below, or to such other address or addresses for a party as such party may from time to time designate by notice given to the other party. Notices shall be deemed received upon actual receipt by the party being sent the notice, or on the following business day if sent by overnight courier, or on the expiration of three (3) business days after the date of mailing.

If to PG&E:

Pacific Gas and Electric Company
Attention: Land Agent, Hydro Support
3600 Meadow View Drive
Redding, California 96002

With a copy to:

If by registered or certified mail, return receipt requested:

Pacific Gas and Electric Company
Law Department
P.O. Box 7442
San Francisco, CA 94120
Attention: Director & Counsel, Contracts Section (Real Estate)

If by personal delivery or overnight courier:

Pacific Gas and Electric Company
Law Department
77 Beale Street, Mail Code B30A
San Francisco, California 94120
Attention: Director & Counsel, Contracts Section (Real Estate)

If to Grantee:

Department of Water Resources
Attention: Real Estate Branch Chief
Paul Farris
Post Office Box 942836
1416 Ninth Street, Room 425
Sacramento, CA 94236-0001

With a copy to:

Department of Water Resources
Attention: Electrical Engineering Services Branch Chief
Tim Kennelly
Post Office Box 942836
1416 Ninth Street
Sacramento, CA 94236-0001

13. Governing Law. This Agreement shall in all respects be interpreted, enforced, and governed by and under the laws of the State of California.

14. Entire Agreement. This Agreement supersedes all previous oral and written agreements between and representations by or on behalf of the parties and constitutes the entire agreement of the parties with respect to the subject matter hereof. This Agreement may not be amended except by a written agreement executed by both parties.

15. Binding Effect. This Agreement and the covenants and agreements contained herein shall be binding upon, and shall inure to the benefit of, the parties hereto and their respective heirs, successors and assigns (subject to the provisions of Section 18). No assignment or delegation by Grantee, whether by operation of law or otherwise, shall relieve Grantee of any of its duties, obligations or liabilities hereunder, in whole or in part. The covenants of PG&E hereunder shall run with the land.

16. Assignment. Grantee shall not assign, convey, encumber (other than as may be specifically permitted by the terms of this Agreement), or otherwise transfer the easements and other rights herein conveyed, or any portion thereof or interest herein, without the prior written consent of PG&E. Such consent may be given or withheld by PG&E for any reason or for no reason, provided, however, that notwithstanding the foregoing, PG&E agrees that its consent will not be unreasonably withheld, delayed or conditioned in the case of: (a) a proposed transfer or dedication to a governmental agency, or (b) a proposed transfer to an Affiliate (as hereinafter defined) of Grantee. For purposes of the foregoing, an Affiliate of Grantee means an entity that controls, is controlled by, or is under common control with Grantee; the term “**control**” means the possession, directly or indirectly, of the power, whether or not exercised, to direct or cause the direction of the management or policies of an entity, whether through the ownership of voting securities, by contract or otherwise; and the term “**controlled**” and “**common control**” have correlative meanings. Grantee acknowledges and agrees that in any instance where PG&E is required not to unreasonably withhold its consent, it shall be reasonable for PG&E to withhold its

consent if any regulatory agency having or asserting jurisdiction over PG&E or the Easement Area, or having or claiming a right to review and/or approve the proposed transfer, fails to grant approval thereof (or imposes conditions on such approval which are not acceptable to PG&E, in its reasonable discretion). Grantee further acknowledges and agrees that in any instance where PG&E is required not to unreasonably delay giving or withholding its consent, it shall be reasonable for PG&E to make application for approval to any regulatory agency having or asserting jurisdiction, and to defer the giving or withholding of consent, without liability hereunder for delay, during the pendency and for a reasonable time following the conclusion of any such regulatory proceedings.

17. Attorneys' Fees. Should either party bring an action against the other party, by reason of or alleging the failure of the other party with respect to any or all of its obligations hereunder, whether for declaratory or other relief, then the party which prevails in such action shall be entitled to its reasonable attorneys' fees (of both in-house and outside counsel) and expenses related to such action, in addition to all other recovery or relief. A party shall be deemed to have prevailed in any such action (without limiting the generality of the foregoing) if such action is dismissed upon the payment by the other party of the sums allegedly due or the performance of obligations allegedly not complied with, or if such party obtains substantially the relief sought by it in the action, irrespective of whether such action is prosecuted to judgment. Attorneys' fees shall include, without limitation, fees incurred in discovery, contempt proceedings and bankruptcy litigation, and in any appellate proceeding. The non-prevailing party shall also pay the attorney's fees and costs incurred by the prevailing party in any post-judgment proceedings to collect and enforce the judgment. The covenant in the preceding sentence is separate and several and shall survive the merger of this provision into any judgment on this Agreement. For purposes hereof, the reasonable fees of PG&E's in-house attorneys who perform services in connection with any such action shall be recoverable, and shall be based on the fees regularly charged by private attorneys with the equivalent number of years of experience in the relevant subject matter area of the law, in law firms in the City of San Francisco with approximately the same number of attorneys as are employed by PG&E's Law Department.

18. No Waiver. No waiver with respect to any provision of this Agreement shall be effective unless in writing and signed by the party against whom it is asserted. No waiver of any provision of this Agreement by a party shall be construed as a waiver of any subsequent breach or failure of the same term or condition, or as a waiver of any other provision of this Agreement.

19. No Offsets. Grantee acknowledges that PG&E is executing this Agreement in its capacity as the owner of the Easement Area, and not in its capacity as a public utility company or provider of electricity and natural gas. Notwithstanding anything to the contrary contained herein, no act or omission of Pacific Gas and Electric Company or its employees, agents or contractors as a provider of electricity and natural gas shall abrogate, diminish, or otherwise affect the respective rights, obligations and liabilities of PG&E and Grantee under this Agreement.

20. No Dedication. Nothing contained in this Agreement shall be deemed to be a gift or dedication of land or rights to the general public. The right of the public or any person, including Grantee, to make any use whatsoever of the Easement Area or any portion thereof, other than as expressly permitted herein or as expressly allowed by a recorded map, agreement, deed or dedication, is by permission and is subject to the control of PG&E in its sole discretion.

21. No Third Party Beneficiary. This Agreement is solely for the benefit of the parties hereto and their respective successors and permitted assigns, and, except as expressly provided herein, does not confer any rights or remedies on any other person or entity.

22. Captions. The captions in this Agreement are for reference only and shall in no way define or interpret any provision hereof.

23. Time. Except as otherwise expressly provided herein, the parties agree that as to any obligation or action to be performed hereunder, time is of the essence.

24. Severability. If any provision of this Agreement shall be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each provision of this Agreement shall be valid and enforced to the full extent permitted by law, provided the material provisions of this Agreement can be determined and effectuated.

25. Counterparts. This Agreement may be executed in identical counterpart copies, each of which shall be an original, but all of which taken together shall constitute one and the same agreement.

26. Other Documents. Each party agrees to sign any additional documents or permit applications which may be reasonably required to effectuate the purpose of this Agreement. Provided, however, that PG&E will not be required to take any action or execute any document that would result in any cost, expense or liability to PG&E.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year first set forth above.

PACIFIC GAS AND ELECTRIC COMPANY,
a California corporation

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

By: _____
Sarah Hug

By: _____
Angelica Aguilar

Its: Manager, Hydro Support

Its: Chief, Real Estate Branch

Exhibits A, B and C attached

Attach to LD

The Area and Division: 6

Land Service Office: Sacramento

Operating Department: Electric Transmission

USGS location: MDM, T19N, R4E, E ½ of Sec 3 & W ½ of Sec 2

FERC License Number(s): NA

PLAT NO.: X36, G25

LD of any affected documents: NA

LD of any Cross-referenced documents: 2120-04-0347, 0184, 0266, 2121-04-0213

TYPE OF INTEREST: 02, 06, 11c, 42

SBE Parcel Number: 135-04-065G, 135-04-065E

Order # or PM #: 74011245 / 1800

JCN: 06-17-010

County: BUTTE

Utility Notice Numbers: NA

851 Approval Application No. _____ Decision _____

Prepared By: EKF2

Checked By: S2P0

Approved By: SMTK

S:\Bldg\Land_TRANSMISSION PROJECTS\0617010-31304842-Oroville Spillway Emergency

EXHIBIT A
PG&E PROPERTY

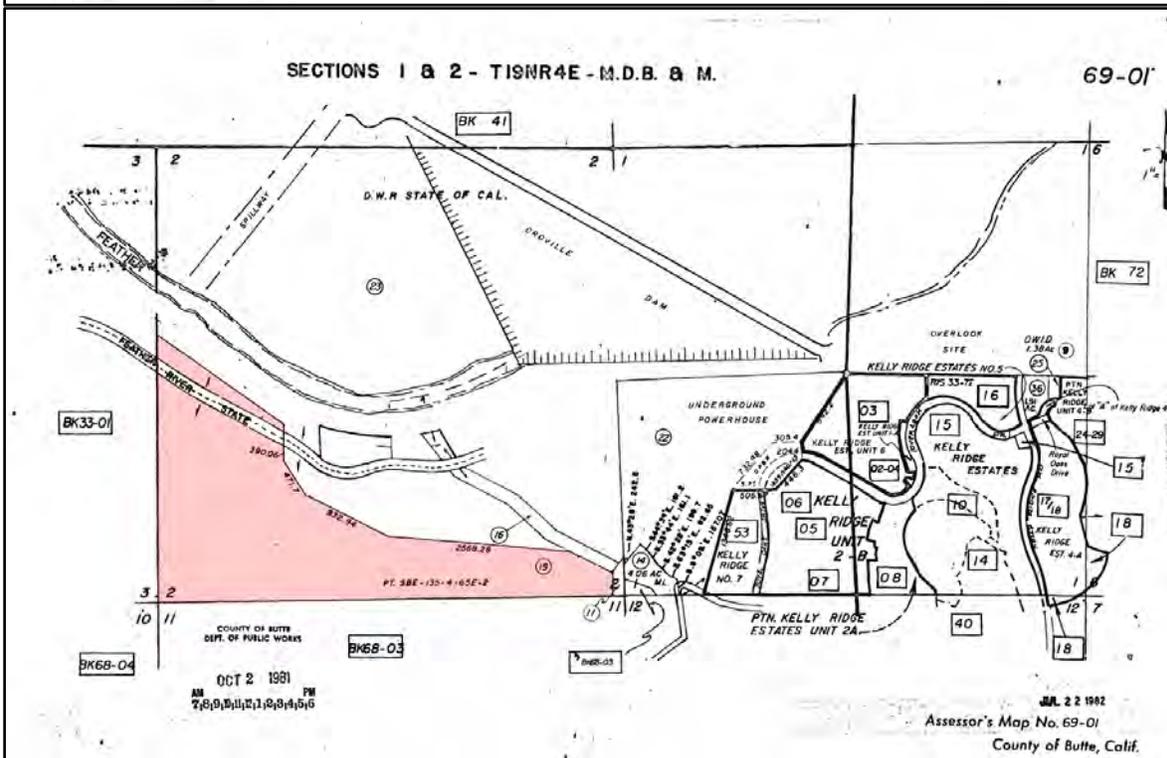
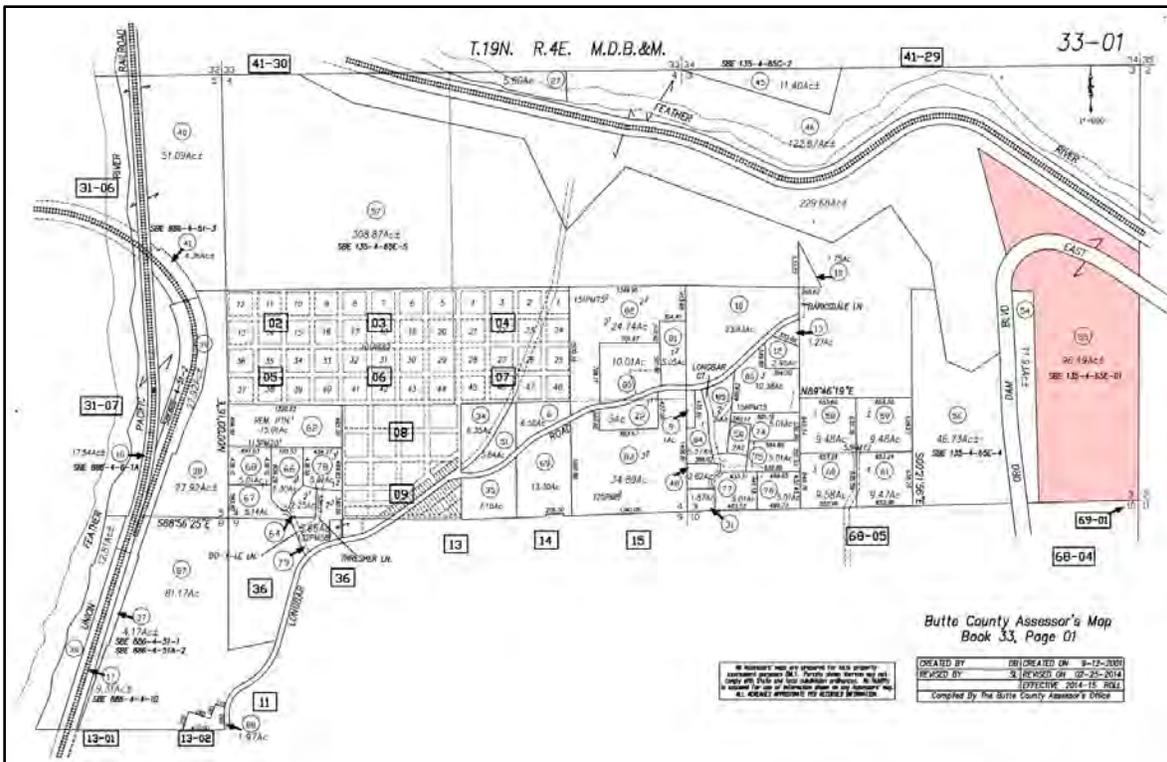


EXHIBIT B

ORO-699

All that real property being portions of Sections 2, and 3, Township 19 North, Range 4 East, M.D.M., County of Butte, State of California, being portions of land described in the deed recorded on November 24, 1917 and in Book 153 of Deeds, Page 54 and the deed recorded on June 18, 1932 in Book 91 of Official Records, Page 446, Official Records of said county, described as follows:

TOWER LINE EASEMENT AREA UNIT A

COMMENCING at a found 3/4" Iron Pipe with Plug marked "ORO-28" shown upon the Department of Water Resources Property Management Drawing Number 04-38 approved on January 18, 1963 and last revised on April 25, 2001, as marking the northerly terminus of a course in the westerly line of PARCEL A, as said PARCEL A is described in the deed recorded January 18, 1963 in Book 1222 of Official Records, Page 462, Official Records of said county, from which a found 3/4" Iron Pipe with Plug marked "ORO-29" shown on said Drawing Number 04-38, marking the westerly terminus of a course in the northerly line of PARCEL B, as said PARCEL B is described in said deed recorded January 18, 1963, bears North 87° 32' 41" West 1214.06 feet, thence along last said westerly line South 03° 52' 19" East 1852.28 feet to a found 3/4" Iron Pipe with Plug Cap marked "ORO-47" shown upon the Department of Water Resources Property Management Drawing Number 04-50 approved on April 17, 2001 and last revised on March 19, 2001 and the Point of Beginning; THENCE FROM SAID POINT OF BEGINNING along the easterly line of said PARCEL B South 14° 48' 00" East 515.59 feet; thence the following three (3) courses and leaving said line:

- (1) South 38° 45' 40" East 1659.37 feet;
- (2) South 48° 00' 51" East 908.94 feet; and
- (3) North 68° 47' 02" East 1239.46 feet to the southerly line of said PARCEL A

thence along last said southerly line North 56° 57' 55" West 358.40 feet; thence the following four (4) courses and leaving said line:

- (1) South 69° 05' 47" West 830.94 feet;
- (2) North 47° 44' 35" West 798.33 feet;
- (3) North 39° 26' 40" West 651.30' to the herein described POINT A; and
- (4) North 39° 26' 40" West 1154.91 feet to the southerly line of said PARCEL A

thence along last said southerly line North 56° 57' 55" West 222.53 feet to the point of beginning.

Containing 25.54 acres, more or less.

UNDERGROUND CABLE EASEMENT AREA
UNIT B

A strip of land 20.00 feet in width lying 10.00 feet left and 10.00 feet right, measured at right angles, on each side of the following described centerline

BEGINNING at the hereinabove described Point A, thence from said POINT OF BEGINNING the following four (4) courses and leaving the Northeasterly line of hereinbefore described UNIT A;

- 1) South 83° 42' 04" East 139.98 feet;
- 2) South 76° 07' 37" East 160.10 feet;
- 3) North 85° 56' 57" East 142.83 feet; and
- 4) South 61° 01' 14" East 100.68 feet to the Southwesterly line of the parcel of land described and designated ORO-690 Unit A described in the EASEMENT recorded August 26, 1988 as Instrument No. 88-028654.

The sidelines of said strip shall be lengthened or shortened to extending from the Northeasterly line of hereinbefore described UNIT A to the Southwesterly line of said EASEMENT recorded August 26, 1988.

EXCEPTING therefrom all that portion of said Oro Dam Boulevard.

Containing 0.22 acres, more or less.

UNIT C

A strip of land 10.00 feet in width lying 5.00 feet left and 5.00 feet right, measured at right angles, on each side of the following described centerline

COMMENCING at the hereinabove described POINT A;
thence along the northeasterly line of the hereinabove described UNIT A
North 39° 26' 40" West 239.35 feet to an existing fiber optic cable and the point of beginning;

THENCE FROM SAID POINT OF BEGINNING and leaving the northeasterly line of the hereinabove described UNIT A and along said centerline and said existing fiber optic cable the following two (2) courses:

- 1) North 41° 59' 02" East 36.87 feet; and
- 2) North 60° 18' 25" East 269.13 feet to the southerly line of said PARCEL A.

The sidelines of said strip shall be lengthened or shortened to extending from the Northeasterly line of hereinbefore described UNIT A to the southerly line of said PARCEL A.

Containing 0.07 acres, more or less.

Bearings and distances used in the above description are based on the California Coordinate System, CCS83 Epoch 2010.00 (2011 Realization), Zone 2, US Survey Feet. The above distances are grid, to convert to Ground multiply by 1.00008234.

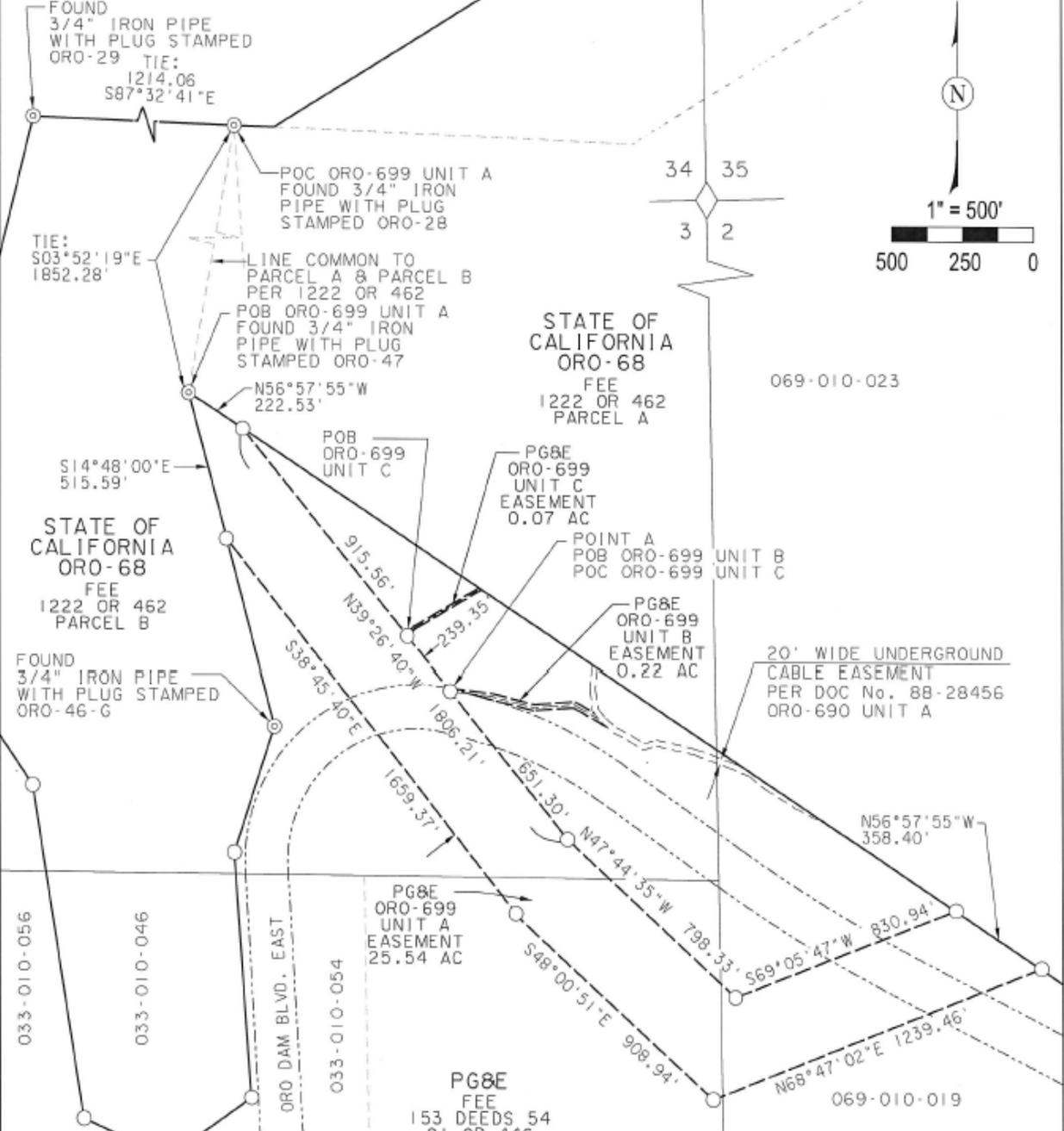


Draft

Albert De Leon LS 7716

for Review

T. 19 N., R. 4 E.
SECTIONS 2 & 3



NOTES:

BEARINGS ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 CALIFORNIA COORDINATE SYSTEM (CCS83) EPOCH 2010.00 (2011 REALIZATION), ZONE 2, US SURVEY FEET.

DISTANCES SHOWN HEREON ARE GRID, TO CONVERT TO GROUND MULTIPLY BY 1.00008234.

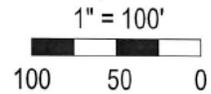
UNLESS OTHERWISE SHOWN, ALL COURSES EXTEND TO OR ALONG BOUNDARIES OR LINES.

033-010-056
033-010-046
ORO DAM BLVD. EAST
033-010-054
033-010-055
12-20-17 De Leon

STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF ENGINEERING - GEODETIC BRANCH

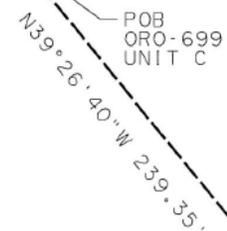
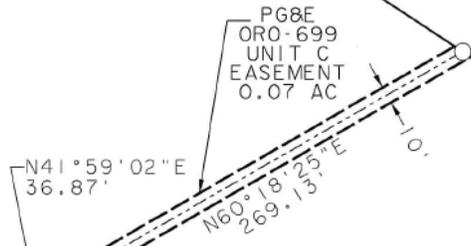
SHEET 1 OF 2
BUTTE COUNTY

T. 19 N., R. 4 E.
SECTIONS 2 & 3



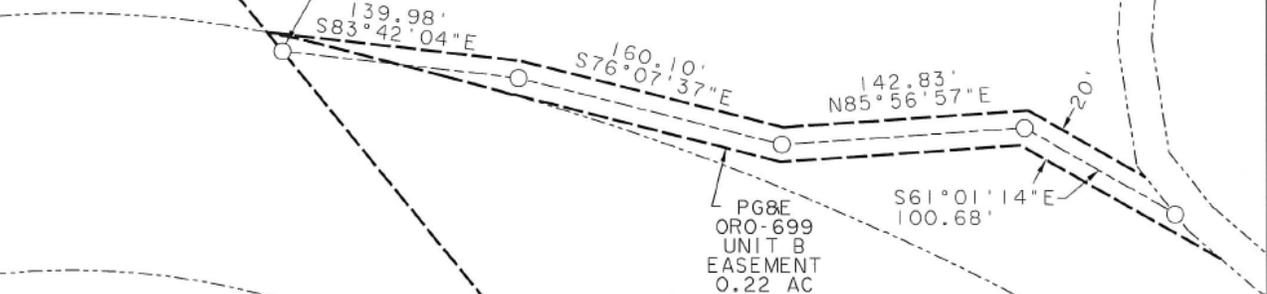
STATE OF CALIFORNIA
ORO-68
FEE
1222 OR 462
PARCEL A

PG&E
FEE
153 DEEDS 54
91 OR 446



POINT A
POB ORO-699 UNIT B
POC ORO-699 UNIT C

20' WIDE UNDERGROUND
CABLE EASEMENT
PER DOC No. 88-28456
ORO-690 UNIT A



PG&E
ORO-699
UNIT A
EASEMENT
25.54 AC

ORO DAM BLVD. EAST

NOTES:

BEARINGS ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 CALIFORNIA COORDINATE SYSTEM (CCS83) EPOCH 2010.00 (2011 REALIZATION), ZONE 2, US SURVEY FEET.

DISTANCES SHOWN HEREON ARE GRID, TO CONVERT TO GROUND MULTIPLY BY 1.00008234.

UNLESS OTHERWISE SHOWN, ALL COURSES EXTEND TO OR ALONG BOUNDARIES OR LINES.

12-20-17 De Leon

SHEET 2 OF 2
BUTTE COUNTY

STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF ENGINEERING - GEODETIC BRANCH

EXHIBIT C

Grantee shall procure, carry and maintain in effect throughout the term of this Agreement the following insurance coverage. Grantee is also responsible for its subcontractors maintaining sufficient limits of the appropriate insurance coverages.

A. Workers' Compensation and Employers' Liability

1. Workers' Compensation insurance indicating compliance with any and all applicable labor codes, acts, laws or statutes, state or federal.
2. Employer's Liability insurance shall not be less than \$1,000,000 for injury or death, each accident.

B. Commercial General Liability

1. Coverage shall be at least as broad as the Insurance Services Office (ISO) Commercial General Liability insurance "occurrence" form with no additional coverage alterations.
2. The limits shall not be less than [REDACTED] per occurrence [and [REDACTED] aggregate] for bodily injury, property damage and products and completed operations. Defense costs are to be provided outside the policy limits.
3. Coverage shall include: a) an "Additional Insured" endorsement (ISO Additional Insured form CG 2010 or equivalent coverage) adding as additional insureds PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of work performed by or for Grantee. If the policy includes "blanket endorsement by contract," the following language added to the certificate of insurance will satisfy PG&E's requirement: "by blanket endorsement, PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of the work performed by or for the Grantee are included as additional insured"; and b) an endorsement or policy provision specifying that the Grantee's insurance is primary and that any insurance or self-insurance maintained by PG&E shall be excess and non-contributing.

C. Business Auto

1. Coverage shall be at least as broad as the Insurance Services Office (ISO) Business Auto Coverage form covering Automobile Liability, code 1 "any auto."
2. The limit shall not be less than [REDACTED] each accident for bodily injury and property damage.

D. Pollution Liability

1. Coverage for bodily injury, property damage, including clean up costs and defense costs resulting from sudden and gradual pollution conditions including the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, hydrocarbons, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any watercourse or body of water.
2. The limit shall not be less than _____ each occurrence for bodily injury and property damage.
3. PG&E shall be named as additional insured.

E. Additional Insurance Provisions

1. Upon the Effective Date of the Easement Agreement Grantee shall furnish PG&E with two (2) sets of certificates of insurance including required endorsements.
2. Documentation shall state that coverage shall not be canceled except after thirty (30) days prior written notice has been given to PG&E.
3. The documents must be signed by a person authorized by that insurer to bind coverage on its behalf and submitted to:

Pacific Gas and Electric Company Insurance Department One Market, Spear Tower, Suite 2400 San Francisco, California 94105	Pacific Gas and Electric Company Land Agent, Hydro Support 3600 Meadow View Dr Redding, CA 96003
--	---
4. Upon request, Grantee shall furnish PG&E evidence of insurance for its agents or contractors.
5. PG&E may inspect the original policies or require complete certified copies at any time.

EXHIBIT C

INSURANCE REQUIREMENTS – DWR Statement of Self-Insurance



Governor Edmund G. Brown Jr.

STATE OF CALIFORNIA PUBLIC LIABILITY AND WORKERS' COMPENSATION INSURANCE FISCAL YEAR JULY 1, 2017 / JUNE 30, 2018

To Whom It May Concern:

In accordance with Government Code section 11007.4, the State of California has elected to be self-insured for liability exposures. Under this form of insurance, the State and its employees acting in the course and scope of their employment are insured for tort liability arising out of official State business. All claims against the State of California based on tort liability should be presented as a government claim to the Government Claims Program, P.O. Box 989052 MS 414, West Sacramento, CA 95798-9052. (Gov. Code section 900, et. seq.) Internet link: <http://www.dgs.ca.gov/orim/Programs/GovernmentClaims.aspx>.

The State of California has also elected to be insured for its motor vehicle liability exposures through the State Motor Vehicle Liability Self-Insurance Program (VELSIP). This program provides liability coverage arising out of the operations of motor vehicles used by state employees for official state business (California Vehicle Code Sections 17000 and 17001). Motor vehicle liability claims against the State of California should be presented to the Office of Risk and Insurance Management, P.O. Box 989052 MS-403, West Sacramento, CA 95798-9052, (800) 900-3634, claims@dgs.ca.gov. If your motor vehicle liability claim is not resolved within six months from the date of loss, California law requires you to file a formal claim with the Government Claims Program, P.O. Box 989052 MS 414, West Sacramento, CA 95798-9052. (Gov. Code section 900, et. seq.) Internet link: <http://www.dgs.ca.gov/orim/Programs/GovernmentClaims.aspx>.

The State of California has a Master Agreement with the State Compensation Insurance Fund regarding workers' compensation benefits for all state employees, as required by the Labor Code.

Sincerely,

A handwritten signature in black ink, appearing to read "Trevor DeAnda", is written over a faint, light-colored signature line.

Trevor DeAnda, CRIS
Associate Risk Analyst
(916) 376-5305
Trevor.DeAnda@dgs.ca.gov

Attachment 2

OER Resources Report

Oroville Spillway Emergency Response and Recovery

Resources Report



California Department of Water Resources



January 24, 2018

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Acronyms and Abbreviations

ac	acres
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
ADI	Area of Direct Impact
ADMP	Asbestos Dust Mitigation Plan
af	acre feet
APE	Area of Potential Effects
BCAQD	Butte County Air Quality District
BGEPA	Bald and Golden Eagle Protection Act
Blvd.	Boulevard
BMP	Best Management Practices
BO or BiOp	Biological Opinion
Cal Fire	California Department of Forestry and Fire Protection
Cal OES	California Office of Emergency Services
Cal OHP	California Office of Historic Preservation
	California Occupational Safety and Health
Cal/OSHA	Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CSC	State of California Species of Special Concern
CV	Central Valley
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
cy	cubic yards
DEIS	Draft Environmental Impact Statement
DHS	Department of Homeland Security
DIER	Draft Environmental Impact Report
DO	Dissolved Oxygen

DPR California Department of Parks and Recreation
DPS Distinct Population Segment
DSOD Division of Safety of Dams
DUA Day Use Area
DWR CA Department of Water Resources

E Endangered Species
e.g. for example
EAP Emergency Action Plan
EMA Emergency Management Agency
ESU Evolutionarily Significant Unit

FBD Fish Barrier Dam
FCO Flood Control Outlet
FE Federally Endangered Species
FEMA Federal Emergency Management Association
FERC Federal Energy Regulatory Commission
FESA Federal Endangered Species Act
FFRHD Forks of the Feather River Historic District
FFS Foothills Fault System
FHWA Federal Highway Administration
FRFH Feather River Fish Hatchery
FSC Federal Species of Special Concern
ft foot/feet
FT Federally Threatened Species

GGG Giant Garter Snake
GPS Global Positioning System

HFC High Flow Channel
HPMP Historic Property Management Plan
Hyatt PP Hyatt Power Plant

i.e. in other words

kV Kilovolts

Low Flow Channel

LFC	
LFR	Lower Feather River
MBTA	Migratory Bird Treaty Act
mi	mile
mm	millimeters
msl	mean sea level
N/A	not applicable
NAHC	California Native American Heritage Commission
nDPS	Northern Distinct Population Segment
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Services
NOA	Naturally Occurring Asbestos
NRHP	National Register of Historic Properties
NTU	Nephelometric Turbidity Unit
O&M	Operations and Maintenance
oC	Degrees Celsius
ODSWP	Oroville Division of the State Water Project Historic District
oF	Degrees Fahrenheit
OWA	Oroville Wildlife Area
PA	Programmatic Agreement
PBFs	Physical and Biological Features
PEL	Permissible Exposure Limit
Pers. Comm.	Personal Comment
PG&E	Pacific Gas and Electric
PLSCADD	Power Line Systems Computer Aided Design and Drafting
PSMFC	Pacific State Marine Fisheries Commission
RCC	Roller Compacted Concrete
Rd.	Road

RGP	Regional General Permit
RM	River Mile
ROW	Right of Way
SCADA	Supervisory Control and Data Acquisition
sDPS	Southern Distinct Population Segment
SE	State Endangered Species
SHPO	State Historic Office Preservation Officer
SMS	Safety Management Systems
Spec.	Specifications
SPK	Sacramento District of the United States Army Corps of Engineers
SR	Rare in the State of California
SR	State Route
SS	Settleable Solids
ST	State Threatened Species
SWFSC	Southwest Fisheries Science Center
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Program
SWRCB	State Water Resources Control Board
T	Threatened Species
TAO	Thermalito Afterbay Outlet
TDD	Thermalito Diversion Dam
TDDP	Thermalito Diversion Dam Powerplant
TDP	Thermalito Diversion Pool
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Loads
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United State Fish and Wildlife Service

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1. Introduction

This document has been prepared to evaluate the potential impacts associated with the actions taken by the California Department of Water Resources (DWR) resulting from the Oroville Spillway Emergency Response and Recovery actions. This assessment has been prepared after the fact due to the emergency conditions that exist due to the Oroville Spillway failure. Because some of the emergency work is still ongoing, we expect that changes and additions to the scope of work will occur and as such a supplemental document may be prepared.

2. Purpose and Need

The purpose of the actions taken by the DWR after the Oroville Spillway failure on February 7, 2017 was to protect lives and property downstream of the Oroville Flood Control Outlet (FCO) and Emergency spillways. This resource report evaluates the potential environmental impacts that may be associated with the Oroville Spillway Emergency Response and Recovery activities.

3. Background – General Site Description

Oroville Dam is located on the Feather River, approximately 75 miles north of Sacramento, California, and five miles northeast of the City of Oroville. The dam is structurally the tallest earthen-filled dam in the United States at 770 feet and impounds approximately 3.5 million acre-feet of water at the full normal operational reservoir elevation of 900 feet above sea level. It is owned and operated by the DWR. The Oroville Facilities were developed as part of the State Water Project (SWP), a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants designed to store and distribute water to supplement the needs of urban and agricultural water users in both Northern and Southern California, the San Francisco Bay Area, the San Joaquin Valley, and the Central Coast region of the state.

Oroville Dam is part of the Oroville Thermalito Complex, which also includes Hyatt Powerplant (Hyatt PP), Thermalito Diversion Dam (TDD) and Powerplant, Fish Barrier Dam (FBD), the Feather River Fish Hatchery (FRFH), Thermalito Power Canal, Thermalito Forebay Dam, Thermalito Afterbay Dam, and the Thermalito Pumping-Generating Plant. In all, the Oroville-Thermalito Complex stores approximately 3.6 million acre-feet and generates power from releases through three powerplants. The Oroville Facilities are operated in part pursuant to a license issued by the Federal Energy Regulatory Commission (FERC). See Appendix B, Figure 3-1 for an overview of the Oroville Thermalito Complex Facilities.

As part of the SWP, the Oroville Facilities are also operated for water supply, flood control, power generation, water quality improvement in the Sacramento–San Joaquin Delta, recreation, fish and wildlife enhancement and salinity control. The main Oroville Dam appurtenant facilities include the 3,000-foot-long gated spillway (Flood Control Outlet), an emergency spillway (Emergency Spillway), Hyatt Powerplant (Hyatt PP) and intake, diversion tunnels, and outlet.

The spillway for Oroville Dam is in a natural saddle on the right abutment of the dam. The FCO Spillway chute consists of an unlined approach channel with approach walls shaped to make a smooth transition to the outlet passage, headworks, and chute. The headworks structure has eight outlet bays controlled by top-seal radial gates. A concrete chute, 178 feet-8 inches wide, extends 3,050 feet from the FCO down the hillside to terminal structures (dentates) where the water plunges into the Thermalito Diversion Pool (TDP). The FCO and Emergency spillways were designed to pass the probable maximum flood. Flood control requirements are set forth by the U.S. Army Corps of Engineers (USACE). The maximum flood control release governed by the USACE is 150,000 cubic feet per second (cfs) based on the analysis of the downstream channel capacity.

The Emergency Spillway is an ungated, concrete overpour weir located to the right of the flood control outlet and is made up of two sections. The right 800-foot section is a broad-crested weir on a bench excavation. The left 930-foot section is a gravity ogee weir up to 50 feet in height. The crest elevation for both sections of the spillway is 901 feet. Except for a narrow strip immediately downstream of the weir, the terrain below the weir was a natural hillside comprised of open grassland, native shrubs and open blue oak and foothill pine woodland.

4. 2017 Emergency Event

January 2017 produced above-average precipitation resulting in 18 inches of precipitation at the Oroville Dam and up to 40-45 inches across the western slope of the Feather River watershed. A major atmospheric river storm with warm temperatures, heavy rain and high snow levels was predicted to arrive by February 5, leading to significant precipitation and snowmelt throughout the Lake Oroville watershed through February 11. Due to the predicted high runoff and inflows into the lake, DWR was required to increase the flood control releases as dictated by the USACE Oroville Dam Flood Control Manual. This led to the FCO Spillway releases of 30,000 to 50,000 cfs starting February 1 to draw down the lake surface elevation and eliminate encroachment into the specified flood control space.

On February 7, with releases from the FCO Spillway at 55,000 cfs, an anomaly in the flow within the FCO Spillway chute was reported at approximate station 33+00. DWR

temporarily stopped releases from the spillway to investigate the anomaly and discovered that portions of the spillway slab were lost and significant scouring of the underlying bedrock had started, including the undermining of about 100 feet of the left spillway wall. Due to the damage, DWR activated the Project No. 2100 Oroville Facilities Emergency Action Plan (EAP) on the afternoon of February 7, and communicated a Non-Failure Emergency Level to downstream entities and Emergency Management Agencies (EMAs). DWR began ongoing consultation with Federal Energy Regulatory Commission (FERC), DWR's Division of Safety of Dams (DSOD), and the USACE. On February 8, DWR reinitiated flood releases through the FCO Spillway for testing and evaluation purposes and to address the rising reservoir levels. For several days, DWR released flows down the damaged spillway, periodically stopping the flows to assess the progression of the undermining and loss of spillway slabs. Concurrently, DWR monitored the development and progression of the significant erosion on the left hillside adjacent to the FCO Spillway and prepared for possible use of the Emergency Spillway. Crews began to remove vegetation from the hillside downslope from the Emergency Spillway weir to decrease the amount of vegetative debris that would potentially enter the TDP should the Emergency Spillway be used. Due to higher than expected inflows and the limits on the amount of water that could be released using the FCO Spillway, the lake elevation increased from February 7 to February 11. On February 11, the water surface elevation of Lake Oroville surpassed 901 feet and water began to flow over the Emergency Spillway for the first time since the Oroville Facilities were built.

Erosion of the bedrock underlying the Emergency Spillway progressed faster than expected and a large head cut began migrating upstream towards the Emergency Spillway. On February 12, the head cut approached to within approximately 30 feet from the downstream toe of the Emergency Spillway Monolith No. 3. This rapid and progressive erosion and the potential for undermining near one of the spillway's monoliths were considered a threat to public safety by the onsite Unified Command. On February 12 at 1630 hours after conferring with DWR, California Department of Forestry and Fire Protection (CAL FIRE), FERC, and DSOD on the risk the erosion posed to the Emergency Spillway, the Butte County Sheriff ordered a mandatory evacuation of the City of Oroville and low-lying areas of Butte County along the Feather River. Governor Brown immediately proclaimed a State of Emergency, and the Governor's Office of Emergency Services activated the State Operations Center to its highest level.

5. Response Actions

To rapidly draw down the water surface elevation of Lake Oroville and arrest flows over the Emergency Spillway weirs, releases from the FCO Spillway were increased to 100,000 cfs. At about 2000 hours on February 12, the water surface elevation of Lake

Oroville dropped below 901 feet and flow over the Emergency Spillway stopped. With no water flowing over the weirs, the erosion on the hillside also ceased. Crews immediately began working 24 hours a day to repair the eroded areas below the Emergency Spillway and armor them with rock and concrete. Erosion to the spillway hillside was assessed via aerial and direct inspection. DWR continued to make releases using the FCO spillway until February 27, when the lake was approximately 50 feet below the crest of the Emergency Spillway, and the radial gates were temporarily closed.

Increasing the FCO Spillway releases to 100,000 cfs exacerbated the damage to the FCO Spillway chute and the hillside. DWR estimates 2.2 million cubic yards (cy) of rock, concrete fragments, and adjacent hillside were eroded and deposited in the TDP (See Appendix B, Figure 5-1 for an overview of Oroville Emergency Response and Recovery Action Areas).

5.1 Post Event Storm FCO Spillway Releases

Following the February 2017 incident, in an effort to draw down the water surface elevation of Lake Oroville, the damaged FCO Spillway continued to be used for lengthy periods, as shown below. Eroded debris from the spillways and the underlying hillsides created a blockage within the TDP directly under the FCO Spillway, causing the water surface elevation in the TDP to rise. The deposited debris greatly reduced hydraulic capacity of the TDP causing the water surface elevation in the TDP to increase to an elevation that prevented the Hyatt PP from making Lake Oroville releases through its turbines and put the powerplant at risk of flooding. The FCO Spillway was shut down for periods of time to allow the eroded material to be removed from the toe of the Spillway. These periods of zero release down the spillway are called “zero flow outages.” DWR created opportunities for these outages by lowering the lake elevation below required flood storage capacities. The length of the outage was determined by how long the inflow into the lake would raise the lake surface elevations to a pre-determined level. As the eroded material was removed, DWR began releasing water through the turbines at Hyatt PP, giving DWR more flexibility in managing the lake elevations. The FCO Spillway gates were closed for the season on May 19. At that time, releases from Hyatt PP exceeded inflows into the Lake and Lake Oroville’s water surface elevation could be managed by Hyatt PP to reach a target elevation of 700-feet by November 1.

Damaged FCO Spillway Releases

January 30 – February 27

March 17 – March 27

April 14 – May 1

May 10 – May 19

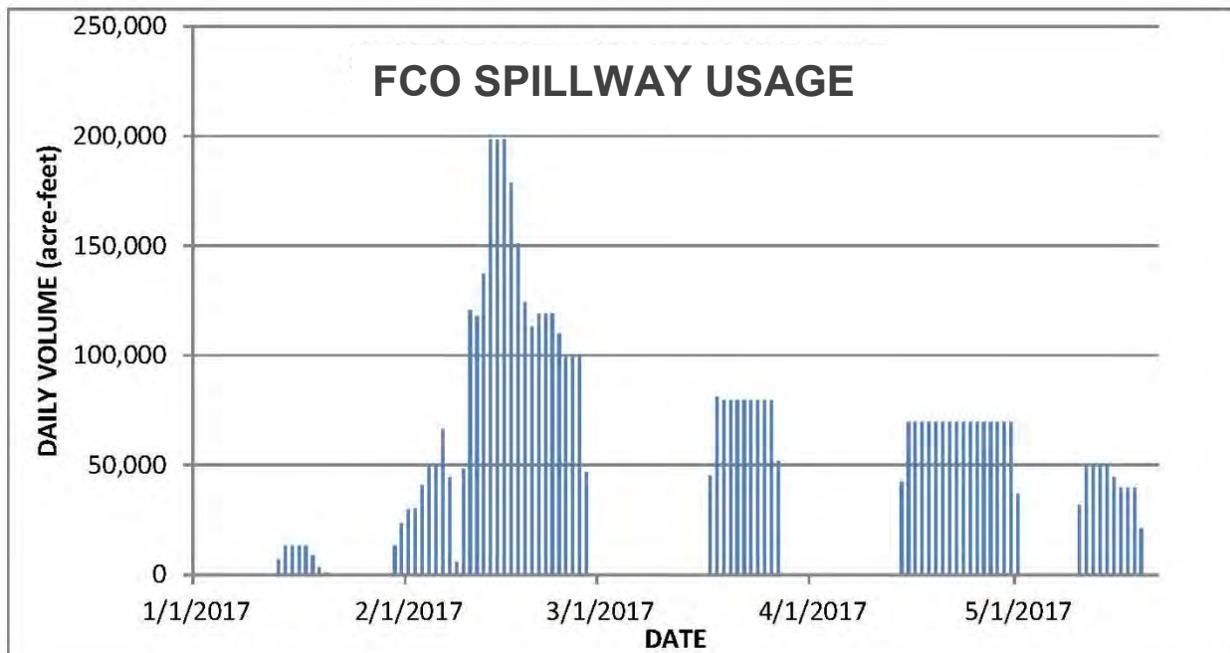
Zero Flow Outages

February 28 – March 16

March 28 – April 13

May 2 – May 9

May 20 – present



5.2 Access Roads, Stockpiles and Staging Areas

Numerous access roads, stockpile locations, staging areas, and work pads were constructed to accommodate heavy equipment usage, hauling routes, dredged material, cranes, inspections, and surveys within the direct vicinity of the FCO and Emergency Spillways. Acreages of disturbance are provided under the Recovery Section 6.6.

Equipment usage included, but is not limited to: excavators, bulldozers, dump trucks, front-end Loaders, chainsaws, tractors.

5.3 Emergency Spillway

When the flows over the Emergency Spillway weirs were stopped and the water surface elevation of Lake Oroville was reduced, emergency armoring of the hillside below the weirs commenced. New access roads were cut in across the hillside to replace the roads that were washed out and to access all areas of the hillside; large diameter rock was placed into scour holes using helicopters; sections of the hillside were graded and excavated to create benches; approximately 107,000 cy of concrete was placed on the hillside immediately downstream of the weirs to prevent additional erosion should the water surface elevation increase and the Emergency Spillway be forced into operation again; staging areas and work pads were created; and additional grubbing and tree removal continued adjacent to the FCO Spillway. Soon after, a temporary “shoofly” alignment for high voltage power lines was constructed on the Emergency Spillway hillside, above the original 230kV alignment.

Equipment usage included but is not limited to: helicopters, excavators, trucks, bulldozers, hand tools and cranes.

5.4 Flood Control Outlet Spillway

No immediate actions were taken on the FCO Spillway while it was being used to make releases. Immediate activities were limited to the areas surrounding the FCO Spillway, including the construction of access roads to provide access to all sections of the spillway. Crane pads were constructed to facilitate the use of cranes to move equipment into/out of the spillway chute. The construction of the access roads necessitated the removal of trees and grubbing of the hillside. The erosion of the hillside by the failure of the FCO Spillway created unstable conditions and posed a danger to construction personnel on the left side of the FCO Spillway. Because the hillside is composed of bedrock, blasting of the hillside was ultimately necessary to cut back the unstable slopes. During the flow outages, temporary access points were constructed to allow DWR access to inspect the chute and perform stabilization activities. Shotcrete was placed under the remaining slabs on the upper chute to help prevent further erosion of the rock under the slabs; coring of the concrete chute and the underlying bedrock commenced to better understand the condition of the rock; and crews began anchoring the remaining upper chute slabs to the underlying bedrock.

Equipment usage included: cranes, self-propelled coring and drilling equipment, excavators, explosives, concrete pumps, hand tools and vehicles.

5.5 In-Water Debris Removal

It is estimated that approximately 2.2 million cy of eroded material washed into the TDP below the FCO and Emergency Spillways, creating a “plug” between the TDD and Hyatt PP. This “plug” caused the tailrace water elevation to rise over 20 feet. The high tailrace elevation prevented the use of the hydroelectric turbines, which meant that water could not be released from Lake Oroville except through the FCO Spillway. Once the surface elevation of Lake Oroville dropped below the invert of the FCO spillway, 813.6 feet, there would be no way to release water from Lake Oroville. In addition, the water elevation in the tailrace was now higher than the elevation of the Powerplant causing flooding within the facility. Removing the “plug” became a very critical task and DWR used excavators on barges, as well as land-based excavators, bulldozers, and front-end loaders to dredge the TDP and remove the “plug.” This operation allowed the water levels in the tailrace to recede to a level where operation of Hyatt PP could resume.

The material that eroded from the spillways was composed of natural rock. Because the eroded bedrock becomes looser and the void space between the rock pieces increases, a swell factor is applied to properly estimate the volume of material eroded to the volume of deposited material. The swell factor converts the naturally compacted rock volume to a loose equivalent. Assuming a 20% swell factor, 60,000 cy more material was deposited than eroded.

Dredging within the TDP began on February 27, 2017. During the Response Phase dredging (Feb 27, 2017 - June 1, 2017), approximately 1.4 million cy of debris was removed from the TDP and as of November 1, 2017, a total of 2.0 million cy of debris have been removed from the TDP. Debris from the dredging operations was transported to one of the three large spoil pile locations set up on the project site.

Equipment used included, but is not limited to: excavators, transport barges, bulldozers, front-end loaders, dump trucks.

5.6 Land-Based Debris Removal

The land based operation consisted of a peak of approximately 20 ‘end dump’ dump trucks and 10-15 excavators at once hauling debris to two of the three large spoil sites within the Project Area.

Equipment used included: dump trucks, bulldozers, and excavators.

5.7 Emergency Powerlines

To mitigate for the immediate threat of sudden failure of the transmission lines within the vicinity of the FCO and Emergency Spillways, due to the flow path of the water flowing over the Emergency Spillway and erosion along the left embankment of the FCO Spillway, both Pacific Gas and Electric (PG&E) and DWR had to first install temporary 'shoofly' lines while a permanent reroute of the lines was developed. The permanent reroute of both sets of powerlines have been analyzed in two Environmental Assessments dated August 2017 by the Federal Energy Regulatory Commission.

5.7.1 PGE Transmission Line - Shoofly

During the initial phases of the Oroville Incident, and prior to the use of the Emergency Spillway, DWR developed maps of the expected pathway of water that would flow over the Emergency Spillway including those areas of the hillside that were at risk of erosion from this flow. PG&E had an existing alignment of steel lattice transmission towers carrying two 230kV circuits (three lines per circuit) that transected lower portions of the Emergency Spillway hillside. Based on the expected flow path, PG&E determined that at least two of their towers were directly at risk should the Emergency Spillway be used.

PG&E immediately removed a 3,000-foot segment of the alignment, including three towers on the north side of the TDP and began installation of a temporary shoofly alignment to bridge the two ends of the interrupted alignment. The shoofly consisted of a single 230kV circuit, or half of the original alignment's power supply. Concurrently, PG&E started work on a new permanent reroute of the interrupted section of the original alignment. The reroute would replace the 3,000-foot section that was removed, but similar to the shoofly's alignment, the permanent realignment would circumvent the portions of the hillside that could be at risk if the Emergency Spillway was used again in the future. PG&E's reroute needed to be completed by June 30, 2017 to meet two critical deadlines: 1) restore both circuits to meet the high-power demands of the summer season and 2) remove the temporary shoofly alignment which was in the pathway of DWR's permanent reroute of their power lines.

Equipment usage included, but is not limited to: helicopters, cranes, excavators, bulldozers.

5.7.2 DWR Transmission Line - Shoofly

Following the Governor's State of Emergency Declaration on February 12, 2017, it was determined that continued erosion of the area surrounding spillway was inevitable and use of the Emergency Spillway was causing further erosion. As the flows progressed in February, the spillway sustained increasing damage to the concrete structure

including the left- and right-wing walls near the erosion path. The fast flow of water began eroding the soil surrounding the spillway, causing increased undercutting of the spillway moving back upstream toward two Table Mountain 230kV Transmission Line Towers 1/4 (one over four). These towers and transmission lines, which are located about 150 feet away from the damaged section of the spillway, carry station service from PG&E's Table Mountain Substation to Hyatt PP when needed and transmits the power Hyatt PP generates from the six hydroelectric generators to PG&E's Table Mountain Substation. If Hyatt became inoperable, the immediate implication was that there would be no release of water through Hyatt to assist with maintaining the elevation of the lake, water temperature control on the river, and loss of station service power to control the gates for the FCO spillway. The flow of water over the emergency spillway created large amounts of debris and erosion, an additional risk to these two towers and two other towers identified as 1/5 (one over five), located north-west of the damaged section of the FCO Spillway.

DWR began development of alternative power transmission line paths from Hyatt PP to prevent complete power loss should the erosion compromise the transmission line towers. The first task was to establish a temporary reroute of the transmission lines in case the transmission line towers 1/4 and 1/5 fail during the emergency. Though the other task was to begin development of a permanent reroute solution out of the inundation zone, this aspect of the project has been filed with FERC and will no longer be discussed or analyzed in this document.

The temporary relocation of the transmission lines, or shoofly, was located uphill above the spillway erosion path and the original transmission line route. This temporary reroute would only provide limited power since only two of the three circuits would be available. Thus, the capacity of Hyatt to move water out of Lake Oroville would be severely restricted if one of the transmission circuits were to fail. Time was of the essence to complete the permanent reroute.

Equipment usage included but is not limited to: Helicopters, cranes, excavators, bulldozer.

6. Recovery Actions

Those actions affiliated with the Emergency Recovery, as documented below, include the development of plans and specifications for the reconstruction of the FCO and Emergency spillways, equipment and personnel mobilization, development of road access to the site, and demolition and construction of the spillways.

6.1 Reconstruction of the Emergency Spillway

The major new features of the Emergency Spillway reconstruction include the Crest Cutoff Wall, the Secant Cutoff Pile Wall, the sloped wall RCC Buttress, and the RCC splash pad. Additional construction details are provided below and under Section 6.2.

6.1.1 Crest Cut-Off Wall

Work on the Emergency Spillway Crest Cut-off Wall includes:

- Selective demolition of asphalt pavement and base right of approximate stations 9+00 to 16+00, including guard shack located right of Sta. 10+25;
- Selective demolition of the Emergency Spillway “Bump” from Sta. 10+00 to Sta. 18+00 and the transition section from Sta. 18+00 to 18+30;
- Excavating a 10-foot deep, 2-1/2-foot wide vertical trench from Sta. 10+00 to Sta. 18+30, and stockpiling of the excavated material;
- Cleaning the cut-off trench invert and side walls using an air jet and an air-water jet, and removing and stockpiling loose solids and liquids from the cut-off trench using a vacuum truck and small excavator;
- Concrete, Erosion Resistant Concrete and reinforcing steel in the lower trench and formed profile section of the cut-off.

The cut-off trench will be excavated from the top down on both abutments, and the excavated material will be windrowed continuously during trenching. The windrowed material will be removed and stockpiled on site, as needed or as directed, to prevent material from falling back into the cut-off trench prior to placing concrete. As the trencher completes the excavation near the lowest point of the cutoff trench, a smooth bucket backhoe may be used to remove the bulk of the loose cuttings remaining in the trench.

Once the cut-off trench is at full depth, the cut-off trench invert and side walls will be cleaned, as directed, in a top-down sequence using an air jet and an air-water jet from standing outside the cutoff trench. The final pass of cleaning will be done by an air-water jet with a suitable amount of water, as approved, to provide a clean surface.

Cast-in-place concrete will be used to create the new cut-off wall (see Structural Concrete in Section 6.2).

Equipment usage includes: Excavators, backhoes, air jets, air-water jets, concrete mixing trucks.

6.1.2 Secant Pile Wall

The secant pile wall consists of a series of overlapping 36-inch-diameter drilled shaft elements which create an erosion cutoff wall located approximately 750 feet downslope of the Emergency Spillway. Work includes:

- Selective demolition of the Emergency Spillway rock slope protection along alignment of secant piles;
- Drilling holes for primary secant piles;
- Concrete in the holes of primary secant piles;
- Drilling overlapping holes for the secondary secant piles;
- Concrete and reinforcing steel in the holes of secondary secant piles;
- Steel reinforcement above the secant piles in the curb cap.

Equipment usage includes but is not limited to: excavators, bulldozers, loaders, pile drivers, rotary drill rigs, augers, concrete mixing trucks, steel piles, shoring equipment.

6.1.3 Roller Compacted Concrete (RCC) Buttress and RCC Splashpad

Construction of the RCC Buttress (sloped wall) and RCC splashpad (apron) on the hillside of the emergency spillway is proposed for 2018. This addition of these features will dissipate the energy of any water flows and provide erosion protection between the weir and the secant pile wall.

The RCC Buttress will be a curve-topped berm of roller compacted concrete placed against the existing spillway monoliths to increase monolith stability. Additional drains will also be added to the monoliths to improve stability.

The RCC Splashpad will be a 5- to 10-foot-thick apron of roller compacted concrete covering the formerly exposed hillside between the weir extending down to the secant pile wall. The RCC Splashpad will be contoured to direct flows to the main drainage channel where additional armoring in the channel will further reduce risk. The RCC surface will also be stair-stepped to help dissipate flow velocities and energies.

Equipment usage includes but is not limited to: excavators, rollers, bulldozers, and haul trucks.

6.2 Reconstruction of the Flood Control Outlet Spillway

The FCO Spillway will be restored to a capacity almost twice its highest historical outflow to prevent future use of the emergency spillway. The proposed design will allow approximately 270,000 cfs to pass through the FCO Spillway (historical maximum flow was 160,000 cfs).

The project includes the work associated with the FCO Spillway chute and will include removing and replacing the upper and lower FCO Spillway chute, restoring sections of the foundation, and strengthening the Emergency Spillway. The objective of the recovery is to get systems in place by November 1, 2017 to accommodate flows from the upcoming 2017/2018 winter storms. The following highlights the activities for the upper, middle and lower FCO Spillway chute:

Upper FCO Spillway chute (STA 13+00 to STA 29+00) work includes:

- Blasting, demolishing, and excavating to chute subgrade;
- Preparing the foundation;
- Constructing the drain system, leveling slab, and reinforcing the concrete chute.

Middle FCO Spillway Chute (STA 29+00 to STA 39+00) work is the most extensive, as the foundation has been scoured and eroded and requires foundation rebuilding. Work in this area includes:

- Blasting, demolishing, and excavating to provide base for RCC backfill;
- Constructing concrete backfill and RCC foundation for the reinforced concrete chute.
- Constructing the drain system and reinforcing the concrete.

Lower FCO Spillway Chute (STA 39+00 to STA 43+00) work includes:

- Blasting, demolishing, and excavating for cutoff walls;
- Constructing cutoff walls;
- Placing temporary shotcrete protection as necessary;
- Constructing RCC buttress and apron.

The main features indicated above for both the FCO and Emergency Spillways Reconstruction are discussed in more detail below.

- **Selective Demolition:** Partial or complete demolition will occur on the upper and lower FCO Spillway chute walls, footings, invert panels, and anchor dowels, and on the emergency spillway, which includes soil, rock, grout, and shotcrete excavation.
- **Earthwork:** Earthwork includes excavation, rock excavation (after blasting), select fill, and pervious backfill. Clearing and grubbing of project area will be completed prior to excavation, stockpiling, trenching, or fill operations. Excavation and fill placement will be made to lines and grades shown in the drawings.
- **Blasting:** Controlled blasting is used within the existing FCO spillway, and in areas outside the spillway to excavate and further demolish the damaged spillway.
- **Aggregate Rock Processing Plant:** A rock processing plant was developed to provide aggregate products for use in the RCC batch plant. The plant will primarily use existing stockpiles of rock and soil products dredged from the TDP.

The Contractor will develop the material processing areas including the layout design, and development of the processing plant, crushing operation, conveyors, wash operation, piping for water, and trial operation.

Following completion of aggregate production, the rock processing area including ditches and roads will be restored to pre-construction contours.

- **Foundation Preparation:** Foundation preparation is required within the FCO Spillway chute prior to placement of concrete products. The foundation on which structural concrete, dental concrete, or leveling concrete will be placed will be other concrete or clean rock that is free of large boulders, loose foundation rock, and debris or standing water. For areas where RCC is to be placed, the foundation will be clean rock that is free of debris and standing water.

The entire foundation surface will be scaled to remove all loose rock slabs, rock wedges, jutting points, or debris, including all concrete from the existing FCO Spillway chute structure.

After demolition of the FCO Spillway chute, the foundation will be cleaned down to intact/firm rock, loose debris will be removed, and methods such as pressure washing, or air blasting, will be used that will result in a high degree of cleanliness.

Dental Concrete will be used as specified by the Engineer to fill foundation cavities, depressions, and overhangs. Leveling concrete will be used to fill excavated treatment areas and backfill over-blast areas.

- **Roller Compacted Concrete (RCC):** RCC will be placed for foundation replacement for a portion of the FCO chute and at the Emergency Spillway (RCC Buttress Apron). Prior to placement of RCC, rock surfaces will be cleaned free of mud, silt, vegetation, water, and other detrimental materials, and be covered with a minimum 1-inch layer of Bonding Grout. RCC will be spread onto the fresh Bonding Grout.

An RCC batch plant was constructed on site to utilize the native material dredged from the TDP, as much as possible. The RCC batch plant is located in the Spillway Boat Ramp Parking Lot.

Drains: A network of various types of drains will be installed within the FCO chute to collect seepage. Drains will be located under the FCO chute slab and behind the FCO chute walls.

- **Anchor Bars:** Steel anchor bars will be placed within the FCO chute footprint to tie the structural concrete slab into the rock foundation and/or RCC.
- **Structural Concrete:** Structural cast-in-place concrete will be utilized to create the FCO chute slab and walls, footings, emergency spillway crest cut-off wall, and secant pile cut-off wall.

A structural concrete batch plant was constructed on site to utilize the native material dredged from the TDP, as much as possible. The structural concrete batch plant is located on Spillway left, toward the bottom portion of the Spillway.

An on-site central mixing concrete batch plant is required for production of concrete used to construct the spillway concrete. The plant will produce structural concrete, erosion resistant concrete, and leveling concrete. An off-site or on-site batching plant may be used to supplement the central mix concrete plant and to produce concrete for dental and leveling concrete, cut-off wall concrete, shotcrete, mass concrete, bedding mortar, and slush grout concrete.

6.3 Continued In-Water Debris Removal

The TDP must be able to convey adequate flow such that the original design boundary conditions are met; specifically, the TDD must meet the performance rating curve requirements under the FCO rating curve inflows and simultaneously prevent excessive backwater water surface elevations in the TDP. Because of this, the capacity and

functionality of the TDP was analyzed to determine whether the channel could adequately convey the pre-incident operational curve in its current condition (that is, after the final gate closure on June 1st), or if more removal was necessary. Ultimately, the hydraulic analyses determined that additional dredging would be required to restore the capacity of the TDP but that not all the debris would need to be removed. Therefore, approximately 320,000 CY of deposited material will remain in the TDP while still meeting the TDD performance requirements.

6.4 Powerlines

6.4.1 PG&E Shoofly Wreck-Out

Upon energization of the permanent rerouted PG&E lines, the shoofly was removed primarily via helicopter. PG&E crews removed all conductors and associated hardware via bucket trucks and line trucks. A vacuum truck was used to remove the rock at each location that was used as backfill when the towers were constructed. All material was hauled offsite. A helicopter was used to remove the poles and moved to an offsite location. In total, 13 light duty steel poles were removed as part of the original shoofly.

Equipment used includes, but is not limited to: Helicopter, crane, excavator, bucket truck, line truck, and vacuum truck.

6.4.2 DWR Shoofly and Original Lattice Tower Wreck-Out

Energization of the DWR permanent reroute occurred on or about September 22, 2017. The wreck-out of the original lattice transmission towers near the spillway was completed and the lattice towers were removed. The wreck-out of the shoofly towers may remain on hold until 2019. The wreck-out of all shoofly towers may involve the use of a helicopter, crane, bulldozer and excavator. Surrounding soils may be disturbed to create additional crane pads and to remove the concrete footings.

Equipment used includes, but is not limited to: Helicopter, crane, excavator and bulldozer.

6.4.3 13.8 kV Powerline and Associated Fiber Optic Communication System Replacement

A 13.8kV power feeder cable and associated fiber optic system was compromised during the Oroville Spillway incident. The 13.8kV distribution feeder cable (circuit) supplies station service power from the Thermalito Diversion Dam Powerplant (TDDP) hydroelectric generator (rated at 3.3 MVA) to the Hyatt PP. The main purpose of this generator is to provide station service power to Hyatt PP, power to the River Valve Outlet System, and power to the radial gates on Oroville Dam's Flood Control Outlet

Spillway. The circuit traverses the TDP's southern boundary from the TDDP to the Hyatt PP. A portion of this circuit, immediately upstream from the TDDP, is within the TDP, while the remaining portions are directly buried in the southern bank of the TDP.

Sections of the 13.8kV feeder cable were exposed by erosion which placed the cable at risk of failure by either high flows in the TDP or by the operation of heavy equipment used during the dredging of the TDP as part of the emergency response. The exposure of the 13.8kV cable, slope stability issues, and potential exposure of the fiber were not fully realized until after the TDP had been restored and emergency work shifted to rerouting the damaged 230kV transmission lines (i.e. Powerline Replacement Project). See Figure 6.4-1, Former and Proposed alignments for the 13.8 kV Powerline and Associated Fiber Optic Communication System Replacement Project.

Additionally, system communications between the TDDP, Hyatt PP, and the Oroville Operations and Maintenance (O&M) center rely on an existing fiber optic system. The fiber optic line is buried underground along the same corridor, and within the same trench in some places as the 13.8kV feeder cable. Its main purpose is for Supervisory Control and Data Acquisition (SCADA) communications between TDDP, Hyatt PP, and the O&M center. The O&M Center plays a key role in supporting the operations of the Oroville Communications Network.

These systems are critical components for the reliability and security of Hyatt PP. A "No Action" alternative was analyzed and the results showed that DWR may not meet its senior water rights obligations to maintain reliable and safe operation of the Oroville Dam while also ensuring a stable ecosystem for the Feather River. Without the replacement of these key components, Hyatt PP's reliability may be compromised putting at risk the operations of the Oroville complex which will directly impact the goal of the recovery operations on the Oroville Spillway. (CA Department of Water Resources, 2014)

The new fiber optic cable and power distribution line will be installed simultaneously. While the existing fiber optic cable will remain in-service, the 13.8kV cable will be decommissioned during construction. Once the new fiber optic line and power cable are constructed, power and communication will be transferred from the existing to the new lines to minimize disruption to Oroville Dam operations. DWR has conducted a routing study and impacts to the environment will be minimized during construction and operation of the new 13.8kV feeder and fiber optic cable.

The 13.8kV powerlines and fiber optic cable will be installed completely underground in conduit. This configuration will minimize the risk of outages due to vandalism and deterioration from exposure to elements and will minimize environmental impacts.

The alignment of the 13.8kV feeder cable will follow the Brad Freeman Trail from the TDDP to Hyatt PP. Project changes are continuing to be made to address potential environmental and cultural resources impacts. An additional section of the fiber optic line will be installed in underground conduit and will be routed adjacent to Oro Dam Boulevard and Glen Drive to the O&M Center.

Equipment to be used includes, but is not limited to: excavators, trenching equipment, shoring equipment, loaders and dump trucks.

6.4.4 230 kV Powerlines-Eagles Nest

A previous Environmental Assessment developed by FERC (FERC No. 2100-180) analyzed the impacts of the installation of the 230kV powerlines re-alignment. It discussed the bald eagle nest next to the alignment and the measures taken to avoid impacts to the bald eagle pair and juvenile. Since this filing, the tree was analyzed and determined to be a hazard tree that, in the future, could impact the 230kV powerlines. Thus, after the juvenile fully fledged, the tree was felled and the eagle nest removed and stored as per the subsequent United States Fish and Wildlife Service (USFWS) Eagle Nest Take Permit Requirements (MB53028C-0).

Additionally, a tree analysis was conducted and four trees on the south side of the TDP were chosen for surrogate nest structure installations.

Equipment used included, but is not limited to: cranes, work truck, chain saw, professional tree climbers.

6.5 Radial Gates

To ensure public safety and integrity of both the Oroville Dam and the TDD, and their associated features, DWR will repair components of the radial gates on both the FCO Spillway and TDD that were damaged during the Incident. Both sets of radial gates will be returned to their original functions. The work will include site preparation; mobilization and demobilization; radial gates repairs and replacement of tension rods, seals, and other hardware; and environmental site protections.

The project footprint includes staging areas and the creation or improvement of access roads on the lakeside of the FCO Spillway. Access to the site will be limited to designated access routes. Parking of vehicles and construction equipment will be limited to the confines of the project site. Temporary gates and fences will be installed wherever necessary to keep construction equipment confined to the project site.

6.6 Access Roads, work pads, staging areas, and spoils sites

Due to the types of work, the number of contractors, and the accessibility required to restore the spillways; numerous access roads, work pads, staging areas, and spoil locations were cleared of vegetation.

Table 6.1 provides a rough estimate of areas potentially impacted by project activities that are necessary to complete the emergency spillway and FCO spillway restoration, including additional spoils locations and access roads.

Table 6.1 – Area Estimates for Major Project Activities

Feature Type	Size (acres or miles)
Access Roads	28.31 miles
Spoil Piles	41.17 acres
Crane Pads	0.83 acres
Concrete Batch Plants	7.47 acres
Kiewit Areas ¹	314.9 acres

¹Kiewit Areas include the entirety of the FCO and Emergency Spillways, access, staging, spoils, offices, etc. This is a general footprint for their project area.

6.6.1 Burma Road

The only access point for construction traffic to enter the site is an existing bridge over the FCO Spillway. This bridge has a load limit restriction that reduces the rate that concrete and other truck traffic can enter the construction site.

In order to accommodate heavy equipment and truck access for transporting construction materials to the construction site, DWR proposed to widen an existing single-lane dirt road (Burma Road).

Burma Road, which extends approximately 4.8 miles in total length, was a construction access route during the building of Oroville Dam in the 1960s. It forms a portion of the Brad-Freeman trail and is also used by State Parks for safety patrols. Burma Road had two single-lane bridges, primarily used for pedestrian or equestrian access, but could accommodate passenger vehicles. The existing road width ranged from about 19 feet to about 35 feet, with small V-ditches on the upslope side. In many places, the road was cut into the slope, with steep faces both below and above. The road has never been paved but the southwest end was graveled and cobble had been placed along wet

spots throughout. There are also many small pipe culverts conveying water under the roadway.

The northeastern 1.3 miles of the road lies within the existing emergency response construction zone. Thus, no additional work was proposed in this area because the road had already been altered to accommodate heavy equipment.

Therefore, during the DWR Response Actions, portions of Burma Road were widened (approximate width 28 feet, including a 22-foot-wide road bed and flanking V-ditches using a mix of cut and fill methods) to accommodate larger trucks and heavy equipment. Box culverts were installed at two of the stream crossings to allow heavy equipment and materials access to the Oroville Spillway repair site and Spoils Site #3. Portions of the 3.5 miles that needed improvement, but had sufficient width, required only culvert replacements, overhead vegetation trimming, and/or rock added to the road bed.

Equipment used included, but is not limited to: graders, bull-dozers, dump trucks, excavators, water trucks, fill material, and culverts.

6.6.1.1 Burma Road, Power Canal Road and Cherokee Road – New Construction

Additional improvements to Burma Road are being proposed to accommodate larger construction vehicles to the Oroville Spillways construction site. Improvements that are being considered include: paving, widening and/or maintaining ~0.8 miles of Power Canal Road between Table Mountain Boulevard and Cherokee Road, ~0.4 miles of Cherokee Road between Power Canal Road and Burma road, and ~5.7 miles of Burma Road from Cherokee Road to the Lake Oroville Spillway Boat Launch Facility, a total of 6.9 miles of roadway. Because the road, as is, cannot handle large vehicles/large loads, specifically around tight curves, the radii at tight curves would need to be increased to allow for the large trucks and large loads to easily maneuver the one-way route up to the Spillway, for continuing Recovery activities. The pavement width would need to be widened by up to 30 feet around curves, and may require culverts to be extended, potential vegetation removal and/or trimming, and placement of fill.

Equipment to be used includes, but is not limited to: Excavators, dump trucks, graders, pavement equipment, rollers and chainsaws.

6.7 Borrow Material

The material recovered from the TDP was stockpiled and is actively being processed for concrete production. Other materials not utilized in concrete production are being utilized on site as common backfill for roadways and working pads. Concrete demolished during the restoration of the spillway is being recycled into road base. Due to the amount of concrete required to complete both the FCO and Emergency Spillways, it has been determined that the hard rock excavated from the TDP will be

insufficient to complete the project. Therefore additional sources of material are needed from the OWA and Spillway left.

6.7.1 Oroville Wildlife Area – Pervious Backfill Material

The Oroville Wildlife Area (OWA) is recognized for its vast mine tailings (i.e. cobble material). The cobble within the OWA has been assessed utilizing a gradation sampling procedure. The rock was deemed usable as pervious backfill for the walls of the FCO Spillway. Approximately 80,000 cy of rounded 3-8-inch rock will be required for the pervious backfill. Two locations within the northern portion of the OWA have been identified for potential excavation. Each site will accommodate a staging area and may require additional roadway improvements. Highway 162 and Canyon Drive will be the main haul routes from the OWA to the Spillway. Depending on the urgency, work at the OWA and transport may occur at night as well as during the day. If used, it is anticipated that this material will be excavated from an area within the OWA starting in early 2018. See Appendix B, Figure 6.7-1 for a map of the proposed Borrow Sites within the OWA.

Equipment to be used includes but is not limited to: excavators, dump trucks, loaders and water trucks.

6.7.2 Spillway Left – Borrow Site Excavation

In order to meet the needs for the RCC, DWR is exploring the use of the Spillway Left hillside for RCC material needs. It is estimated that 380,000 cy of coarse rock material will need to be removed from a quarry at Spillway Left. The total project footprint comprises a maximum vertical depth of 80 feet, and an area of 7.1 acres. See Appendix B, Figure 6.7-2 for Left of Spillway Borrow Material Location.

Equipment to be used includes, but is not limited to: excavators, dump trucks, bulldozers, loaders, water trucks, rock drills and controlled blasting techniques.

6.8 Feather River Fish Hatchery

The FRFH was built in 1967 as mitigation for the loss of Chinook salmon and steelhead spawning habitat due to the construction of Oroville Dam. The Facility is located along the north embankment of the Feather River, approximately four river miles downstream from the Oroville Dam on property owned by DWR in Oroville, Butte County, CA (near latitude N 39°31'5.20" and longitude W 121°33'11.62"). The FRFH includes the Fish Barrier Dam, fish ladder, collection and holding tanks, enclosed spawning facility and early incubation facilities, grow-out ponds, aeration tower and settling ponds, and fish transport vehicles. The main hatchery building houses the spawning operation and incubators. The Thermalito Annex Fish Facility (Thermalito Annex) is a FRFH satellite

facility located about ten miles from the FRFH along the west side of the Thermalito Afterbay and provides additional fish-rearing capacity.

On February 7, 2017, when signs of the FCO Spillway failure were observed, it became evident that the fish at the FRFH were at risk. An effort to protect the fish and the facilities that support them was initiated and included:

- Movement of fish to the Thermalito Annex which relies on groundwater wells, rather than river water
- Creation of a sediment settling basin within the rearing channel to pump clean, settled water into the headboxes in the rearing channel
- Development of alternative sources of water using a fire hydrant
- Cleaning out of mud in the incubation stacks and inland ponds
- Monitoring and maintaining turbidity and water quality levels
- Use of supplemental medicated and probiotic feed to improve the health of the fish
- Additions of salt to prevent disease
- Cleaning of raceways

Equipment used includes, but is not limited to: Fish planting trucks, skid steers, generators, fire hoses, carbon filters, manifolds, charcoal filters, aerators, pumps, nets.

6.9 Boundary Fence

Cattle that roam various properties to the north of the TDD typically have access to the water's edge. A boundary fence was installed that aligns with the FERC boundary to keep cattle from entering the project area and for safe use of Burma Road. In March, approximately 3.4 miles of 5-strand barbed wire fencing with t-posts and wooden supports was installed over a period of 6-8 weeks. Selective trees and/or vegetation were trimmed or removed within a 6-foot swath on the DWR side of the fence from the Spillway Boat Ramp parking lot to Morris Ravine. Tree stumps were left in place. The fence crosses but was not placed within stream channels.

Equipment used includes, but is not limited to: motorized track wheelbarrow, all-terrain vehicles, excavator, water buffalo, backhoe with rubber tires, small auger, wood chipper, loader, and trucks.

6.10 Miscellaneous Oroville Recovery Actions

Additional projects have occurred throughout the project site, aiding in the overall Recovery Actions. Some of these less defined actions include bridge shoring, road repairs, air station setup, office site construction, geology monitoring, and intake water

line and wheel wash stations. These projects are discussed in the broader context of the Oroville Recovery Project, specifically as they relate to the work at the Emergency Spillway (or Spillway right) and the FCO Spillway including Spillway left.

7. Environmental Analyses

7.1 Scope of the Analyses

The geographic scope of this analysis is restricted primarily to the FERC Project 2100 boundary, including the FCO and Emergency Spillways and contiguous hillside, the adjacent lakeside area just to the northeast of the Spillways, Hyatt PP to the east, TDP and the TDD, downstream Feather River, and portions of the OWA. However, some Environmental Analysis sections will generally analyze potential impacts that are outside of the FERC Project Boundary as needed such as Transportation, Recreation, Biological Resources, Cultural Resources, Air Quality, and Noise. The temporal scope of this environmental analysis focuses on the period from the start of response actions in February to the known Recovery actions that will continue at least until site restoration in 2019. The resources potentially affected by this proposal include Aesthetic Resources, Air Quality, Biological Resources including Threatened and Endangered Species, Terrestrial and Aquatic Resources, Cultural Resources, Geology, Soils and Topography, Hydrology and Water Resources, Noise, Recreation, and Transportation. See Appendix B, Figure 7.1-1 for a depiction of the Scope for these analyses.

7.2 Aesthetics

The Aesthetics environment encompasses the visual resources within the emergency project area.

7.2.1 Affected Environment

The Oroville Facilities are in Butte County. Lake Oroville, including the spillways and the TDP, are in the eastern half of the county which begins near the foothills of the Sierra Nevada Mountains and continues east to the range's upper slopes. This part of the county is largely undeveloped and retains much of its natural character, with scattered rural residences and small communities. Vegetative cover in the foothills area includes chaparral, mixed foothill pine/oak woodland, and mixed coniferous forest.

The western half of Butte County is situated along the eastern edge of the Sacramento Valley. This part of the county is primarily flat, and land use is largely agricultural with scattered areas of development ranging in intensity from scattered rural residential to suburban to urban. The aesthetic environment of this part of the county is influenced by human development activities; however, it retains a rural character. The agricultural

areas in this part of the county generally include irrigated row crops and orchards in the flatter areas and grazing in the foothills. Thermalito Forebay and Afterbay are in the western portion of Butte County. Further information on aesthetic resources can be found in the 2006 FERC Draft Environmental Impact Statement (DEIS) (Federal Energy Regulatory Commission, 2006).

7.2.2 Environmental Effects

Views of the area are now dominated by heavy construction equipment, large cleared areas, and construction activities. The impacts to Aesthetics are considered temporary and though construction will continue through 2019, current and future site stabilization, re-vegetation, and restoration efforts will assist in returning the aesthetic quality of the project area to a pre-project level over time.

When possible, projects are being designed to minimize aesthetic impacts. For example, the 13.8 kV powerline/fiber optic communication lines and vaults will be buried underground so as not to interrupt the visual landscape of the recreational trails. Though new fence lines were installed, they were built to match those already in existence and do not adversely affect the aesthetics landscape or its rural character. The new FCO Spillway footprint and visual character will match that of the previous chute so there will be no adverse effects from the FCO Spillway rebuild. The Emergency Spillway which previously consisted of open woodland below the apron will be dominated by a concrete splashpad and buttress that will extend down the hillside.

7.3 Air Quality

This section analyzes the potential air quality impacts as they relate to the emergency response and the subsequent, and on-going recovery operations.

7.3.1 Affected Environment

The Oroville Dam and Spillway are in the low foothills of the Sierra Nevada Mountain Range along the eastern margin of the Sacramento Valley in Butte County, California. Prior to the February 2017 Oroville Spillway emergency incident, the moderate to steep slopes surrounding the spillways was covered with native grasses, brush, and trees. Several pre-existing dirt roads and paved roads were located adjacent to the flood control and emergency spillways.

The site is founded on metamorphosed volcanic bedrock of the Smartville Ophiolite or Smartville Complex (Saucedo & Wagner, 1992). The Smartville Complex is composed of dark gray to green-gray, steeply dipping, strongly foliated, metamorphosed, basaltic to diabasic volcanoclastic sediments, pillow basalt, breccia, dikes, and sills. Locally, the bedrock is hard, dense, fine- to medium-grained, greenish-gray to black, and generally

massive, but with a slight foliation (regional structure) typically present; the foliation consists of a strong joint set, zones of sheared or schistose rock, and relic bedding. Previous geologic mapping by Creely (1965) described the then unnamed metavolcanic bedrock unit as containing less than 20 percent acicular or fibrous pale green actinolite.

Asbestiform actinolite is a regulated amphibole mineral that is associated with lung cancer, mesothelioma, asbestosis, and other respiratory health hazards. Asbestos is regulated under federal, State, and local laws, regulations, and ordinances for occupational health and air quality. In March 2017, the Butte County Air Quality Management District (BCAQMD) determined that the site is within an area of naturally occurring asbestos (NOA), and subject to federal, State, and local air quality regulation.

Air quality baseline information is not available for the area surrounding the spillways from before the February 2017 spillway emergency. However, with periodic rainfall, established vegetation, limited public access, and only routine maintenance activities, it is likely that air quality impacts from site activities prior to the February 2017 spillway emergency were minimal. It is likely that occasional airborne dust was generated at less vegetated or eroded areas at the site during moderate-to-high wind conditions.

7.3.2 Environmental Effects

Air quality impacts from the emergency response and the subsequent on-going recovery operations have varied depending on the specific activities, weather conditions, and time of year. The initial response to the February 2017 spillway emergency consisted of clearing vegetation from the sides of the flood control spillway and downstream of the emergency spillway for better observation of spillway conditions and to remove trees and other debris that could wash down and accumulate against the Thermalito Diversion Dam. Roads were also excavated and graded across the site to allow access to various parts of the spillways and to the Thermalito Diversion Dam staging area. temporarily affected Dust generation from construction vehicles and heavy equipment was minimized by a combination of winter moist soil conditions and mitigated through active dust control using water trucks.

As the spillway emergency transitioned to the recovery phase and with active construction starting in the spring, the potential for temporary air quality impacts was greater. The grading of numerous access and haul roads to facilitate construction, along with active excavation and blasting of soil and rock to stabilize the lower chute of the flood control spillway had, had the potential to impact temporarily affected air quality. Other activities that could potentially affect air quality, if performed without the prescribed dust mitigation, include rock crushing operations to produce aggregate for concrete, operation of a cement batch plant, and the creation of soil and rock stockpiles. dredging of.

Aside from general particulate dust impacts to air quality from these activities, naturally occurring asbestos in the airborne dust may be a potential threat to air quality. Air sampling and analysis for asbestos fibers has detected the presence of asbestiform actinolite structures in both the interior work areas and at the perimeter of the site. Appendix B, Figures 7.3-1 and 7.3-3 show the location of site perimeter air sampling locations. Appendix A, Table 7.3-1 and Table 7.3-2 contain details of the perimeter dust and NOA air sampling locations, respectively. When ongoing ambient air monitoring exceeded the Action Level of 0.005 structures per cubic centimeter, additional mitigation measures were implemented to reduce dust emissions. Biweekly dust and asbestos sampling reports for the site can be found at the BCAQMD's website (Butte County Air Quality Management District, 2017).

Other regulated asbestiform minerals that were occasionally detected in air monitoring include tremolite and chrysotile. Tremolite is another amphibole asbestos mineral that is associated with actinolite. Chrysotile is an asbestos mineral associated with the ultramafic rock serpentinite.

During the emergency phase of the project, air monitoring was conducted to determine if there were detectable levels of asbestos. The samples were collected so management could make a determination as to the proper respiratory protection needed for employee protection. Personal air sampling results showed that most tasks produced fiber concentrations below the OSHA-established Permissible Exposure Limits (PEL) of 0.1 fibers per cubic centimeter as an 8-hour time weighted average. Work tasks involved in the rock crushing operation produced air sample results that indicated that respiratory protection was warranted.

While minimal impacts to air quality will continue throughout construction during the recovery phase of the spillway emergency, those impacts will be limited as mitigation measures are implemented. The application of mitigation measures has generally been successful in reducing dust emissions from emergency response and recovery activities.

7.3.3 Mitigation

Early meetings and coordination with the BCAQMD, the Butte County Health Department, and the California Air Resources Board (CARB) helped develop guidance, mitigation, and monitoring for general dust control and airborne naturally occurring asbestos. A Dust Control and Air Monitoring Plan was developed and submitted to the BCAQMD in March 2017 to address general dust control. With additional guidance and consultation, primarily from the BCAQMD, a Naturally Occurring Asbestos Dust Mitigation Plan (ADMP) was developed and submitted in April 2017. The ADMP describes what measures and practices will be implemented to reduce, monitor, and

mitigate for airborne NOA dust. Since the initial version the ADMP has been revised several times, and will likely be revised in the future as conditions and/or practices change during construction; the currently approved version is Revision 3.0, dated September 2017. See Appendix A, Table 7.3-3.

Mitigation measures for general dust control were developed and implemented early during the emergency response and have continued through recovery activities. The application of water on dirt roads, bare soil, and soil/rock borrow stockpiles has been the main mitigation method. Other mitigation measures included pre-wetting the ground prior to and sometimes during blasting and spray bars along the conveyors to help reduce dust during rock crushing operations.

Additional mitigation measures to reduce airborne dust includes: employee training on speed limits, the use of track-out prevention devices such as rumble strips at the transition between paved and unpaved roads, covering of the soil/gravel in dump trucks during transport, applying gravel to high-traffic unpaved areas and roads, and applying hydroseed mixtures to open excavations and other exposed soil to prevent water and wind erosion. Additional soil stabilization through the application of gravel or pavement on horizontal areas and the establishment of permanent vegetation on exposed cut slopes and some open spaces have been implemented, while a project area-wide restoration plan will begin in 2019, at the conclusion of the construction. Spoil piles may be graded into a more stable geometry and hydroseeded or planted to permanently stabilize the soils.

Additional mitigation measures also included construction contract and specification requirements for the Contractor to submit an Air Quality Control Plan that includes measures the Contractor will follow to reduce fugitive dust and other emissions.

7.3.4 Agency Coordination, Public Involvement, and Permits

As mentioned in the previous section, many regulatory agencies have been involved with air quality aspects of the 2017 Oroville Spillway Emergency. The primary agency that DWR has worked with is BCAQMD. Other agencies include CARB, the Butte County Health Department, and the U.S. Environmental Protection Agency (USEPA). In addition to the governmental agencies involved, DWR's industrial hygiene consultant contractor, Safety Management Systems (SMS) of Bakersfield, California has provided numerous resources and expertise with air monitoring and preparing work plans, reports, and other documents related to safety and air quality.

The Dust Control and Air Monitoring Plan was developed and submitted to the BCAQMD in March 2017 to address controlling fugitive dust emissions under BCAQMD Rule 205. In March 2017, the BCAQMD determined that the Oroville Dam Spillway is

within an area of naturally occurring asbestos, and falls under the requirements of 17 CCR 93105. One of those requirements is to prepare and submit an ADMP for approval.

The Butte County Health Department was consulted early in the process of developing the ADMP regarding overall health issues related to NOA. In support of their regulatory responsibility, the BCAQMD consulted with CARB in conducting air monitoring and reporting requirements under 17 CCR 93105 and 17 CCR 93106, as well as part of the development and approval of the ADMP. USEPA was notified of demolition work in and around the spillway involving asbestos -containing construction materials as required by the National Emissions Standards for Hazardous Air Pollutants (NESHAP) per 40 CFR 261, Subpart M. All site work, along with preparation of the ADMP, also considered and included California Division of Industrial Relations (Cal/OSHA) Construction Safety Orders per 8 CCR 1529.

Press briefings were held regularly during the emergency response phase and into the beginning of the recovery phase of the project. There was one public complaint to Cal/OSHA asserting that DWR was allowing their contractor to fill in a wetland with asbestos. DWR responded to the complaint by providing sample and analytical data demonstrating that no asbestos was present, and no further action was necessary. It should be noted that DWR has installed a number of web cameras overlooking the site so that regulatory agencies and the public can observe the operations, including any fugitive dust emissions resulting from construction activities.

Permitting requirements related to air quality consist of the Dust Control and Mitigation Plan and the Asbestos Dust Mitigation Plan described above. Other permitting requirements included internal combustion engine stationary equipment (generators, rock crushers, etc.) used onsite to be CARB emissions compliant or individually permitted by the BCAQMD.

7.4 Terrestrial Resources

7.4.1 Affected Environment

The Oroville Facilities are located within the eastern edge of the Sacramento Valley and the lower foothills of the Sierra Nevada. Vegetation in this area differs with elevation changes from the valley floor (elevation 100 feet above mean sea level at the lower end of the OWA) to the upper elevation of the mountain range (about 1,200 feet above mean sea level). The vegetation changes from valley grasslands to foothill woodlands (characterized by blue-oak/foothill pine woodlands with varying amounts of chaparral) to mixed conifer forests in the higher elevations.

The lands around Lake Oroville and the TDP are composed of open to dense woodland, forest, and chaparral communities consisting of mixed oak woodlands, foothill pine/mixed oak woodlands, and oak/pine woodlands and chaparral. In the lower elevations, around the Oroville Dam and the TDP, vegetation is mostly blue or mixed oak with varying proportions with foothill pine woodland, open grasslands, and small proportions of chaparral. Primary woodland species include interior and canyon live oaks, blue oak, and foothill pine. The open areas within the woodlands consist of annual grassland species and chaparral vegetation, which is characterized by tough waxy evergreen leaves, including whiteleaf manzanita, buckbrush, toyon, and scrub oak.

A total of 219 species of non-native plants were identified within the FERC project boundary during relicensing surveys conducted in 2002 and 2003. Of these species, 39 are target species identified as noxious or invasive plants by the California Department of Food and Agriculture, California Invasive Plant Council, U.S. Department of Agriculture, and the Plumas National Forest. The largest concentration of noxious or invasive species is located within the OWA. However, noxious and invasive species also occur in areas with existing land disturbance near roads, trails, and in the immediate vicinity of the spillway and power facilities. Similar land disturbance will occur within the new access routes, and areas cleared during project activities.

7.4.1.1 Wildlife Resources

DWR conducted field investigations for relicensing in 2002, 2003, and 2004. Vegetation was mapped within the Oroville FERC boundary, a 1-mile buffer beyond the boundary, and the Feather River floodplain (within the Federal Emergency Management Area (FEMA) 100-year floodplain) downstream of the FERC project boundary.

At that time, 24 habitat types (using the California Wildlife Habitat Relationships (CWHR) classification system) were found to occur within the areas surveyed within the FERC Project boundary. Within the Oroville Emergency project area, 15 habitat types occurred prior to the Emergency Response and Recovery actions. (See Table 7.5-1 under Botanical Resources)

The riparian habitat present within the OWA is the largest remaining block of riparian habitat along the Feather River and provides breeding habitat for a variety of neotropical migrant birds. These habitats also serve as nursery areas for many wildlife species including two large mixed heron/egret rookeries.

The OWA, west of the City of Oroville, is managed by the California Department of Fish and Wildlife (CDFW) for wildlife habitat and recreational activities. Habitats within the OWA include lacustrine, riverine, freshwater emergent, valley foothill riparian, and

annual grassland and dryland grain/seed crops. This area encompasses 6,000 acres including and surrounding the Thermalito Afterbay and the 5,000 acres adjacent to and straddling 12 miles of the Feather River.

7.4.1.2 Wildlife Species

DWR used the CWHR database to predict wildlife species occurrences within the FERC area. 334 wildlife species were predicted to occur within the FERC project boundary, as determined during the relicensing surveys, though less are likely to be found within the Emergency Project Area.

Generally, the area provides seasonal or year-round habitat for a variety of wildlife species including mountain lions, bobcat, raccoons, beaver, mink, badger, gray fox, weasels, coyotes, tree and ground squirrels, rabbits, deer, skunks, ringtails, bears, and many species of waterfowl and bird's native to the area. The project area is known to provide year-round habitat for several species of migratory birds (See Table 7.4-1) as well as non-native vertebrates including bullfrog, house sparrow, bobwhite quail, ring-necked pheasant, rock dove, wild turkey, European starling, opossum, black rat, Norway rat, house mouse, muskrat, red fox, and feral pig.

Waterfowl are an important group of wildlife, for both commercial and recreational purposes in the lower elevation areas of Butte County. Lands managed for commercial grain production or natural wetlands support high wintering densities of ducks, geese, swans, and shorebirds. These lands also provide waterfowl nesting and brooding habitat. Portions of the OWA within the project boundary are managed by CDFW to provide habitat for nesting and wintering waterfowl. Of the numerous recreational activities available at the OWA, about three percent of the recreational use of this area is related to hunting. The Thermalito Complex provides resting and foraging habitat for open water and diving waterfowl species (ruddy duck, bufflehead, scaup, ring-necked duck, common goldeneye, and common merganser), which is generally lacking in surrounding agricultural areas. Habitat for nesting and brooding waterfowl and nesting grebes, however, is limited in the Thermalito Afterbay due to water level fluctuations and recreational high-speed boat use.

As part of an agreement with DWR, CDFW conducts a regular habitat enhancement program in the OWA that includes the planting of upland nesting cover and foraging vegetation for waterfowl, along with thinning/removal of vegetation around the Thermalito Afterbay brood ponds and dredging ponds under their management. The thinning/removal activities are conducted to provide improved access for waterfowl. About 200 acres of land are tilled and planted each year and remain as suitable nesting/foraging habitat for about five years before they begin to revert to grasslands dominated by non-native grasses. In addition, CDFW thins and removes vegetation in

and around ponds and rock piles to provide recreational access to the various habitats. Upland game species in the project area include mourning dove, wild turkey, ring-necked pheasant, and several species of quail.

A summary of wildlife habitats within or near the Oroville Spillway Emergency Response and/or Recovery areas is included under *Botanical Resources* in Table 7.5-1.

An inquiry on September 6, 2017 utilizing the IPaC Resource List for Butte County generated the following list of birds protected under the Migratory Bird Treaty Act that have the potential to be found within the Oroville Emergency Project Area:

Table 7.4-1. Migratory Bird Treaty Act Species.

Species	Season(s)
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Year-round
Black Swift (<i>Cypseloides niger</i>)	Breeding
Black-chinned sparrow (<i>Spizella strogularis</i>)	Breeding
Brewer’s Sparrow (<i>Spizella breweri</i>)	Breeding
Burrowing Owl (<i>Athene cunicularia</i>)	Year-round
California Spotted Owl (<i>Strix occidentalis occidentalis</i>)	Year-round
Calliope Hummingbird (<i>Stellular calliope</i>)	Breeding
Flammulated Owl (<i>Otus flammeolus</i>)	Breeding
Fox Sparrow (<i>Passerella iliaca</i>)	Year-round
Green-tailed Towhee (<i>Pipilo chlorurus</i>)	Breeding
Lawrence’s Goldfinch (<i>Carduelis lawrencei</i>)	Breeding
Least Bittern (<i>Ixobrychus exilis</i>)	Breeding
Lewis’s Woodpecker (<i>Melanerpes lewis</i>)	Wintering
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	Year-round
Long-billed Curlew (<i>Numenius americanus</i>)	Wintering
Mountain Plover (<i>Charadrius montanus</i>)	Wintering

Species	Season(s)
Nuttall's Woodpecker (<i>Picoides nuttallii</i>)	Year-round
Oak Titmouse (<i>Baeolophus inornatus</i>)	Year-round
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	Breeding
Peregrine Falcon (<i>Falco peregrinus</i>)	Year-round
Rufous Hummingbird (<i>Selasphorus rufus</i>)	Breeding, Migrating
Rufous-crowned Sparrow (<i>Aimophila ruficeps</i>)	Year-round
Sage Thrasher (<i>Oreoscoptes montanus</i>)	Breeding
Short-eared Owl (<i>Asio flammeus</i>)	Year-round
Swainson's Hawk (<i>Buteo swainsoni</i>)	Breeding
Tricolored Blackbird (<i>Agelaius tricolor</i>)	Year-round
Western Grebe (<i>Aechmophorus occidentalis</i>)	Year-round
White Headed Woodpecker (<i>Picoides albolarvatus</i>)	Year-round
Williamson's Sapsucker (<i>Sphyrapicus throideus</i>)	Year-round
Willow flycatcher (<i>Empidonax traillii</i>)	Breeding
Yellow-billed Magpie (<i>Pica nuttalli</i>)	Year-round

On the south side of the TDP and adjacent to the transmission line reroute corridor, there was a foothill pine tree containing a primary and a secondary bald eagle's nest. Because the tree was in close proximity and leaned into the transmission line reroute corridor, the tree qualified as a hazardous tree and needed to be removed for safety purposes. Once the eaglet had successfully fledged and the eagles had left the nest for the season, DWR applied for and received an Eagle Nest Take Permit (MB53028C-0) to remove both nests before felling the tree. Relocation of the primary nest is a recommendation in the Permit. However, due to the size and weight of the nest and the potential large construction footprint it would take to relocate it, DWR determined it was not feasible to install the nest in another tree. DWR, in coordination with the USFWS, had the primary nest removed intact. DWR has received an Eagle Nest Exhibition Permit (MB70367C-0) from the USFWS to display the primary nest at the Lake Oroville

Visitor Center. DWR worked with the USFWS and CDFW to install four surrogate nest structures that utilize material from the secondary nest. Bald eagles have been removed from the list of threatened and endangered species since 2007, but are still protected under the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918.

As of January 2018, this pair has been observed nesting on the north side of the TDP having successfully fledged a juvenile in the early summer of 2017.

7.5 Botanical Resources

7.5.1 Affected Environment

A variety of factors influence botanical resources in the project vicinity. Vegetation patterns correspond with elevational changes and depend on precipitation, temperature, soils, aspect, slope, and disturbance history. Unique geologic and geomorphic conditions exist that also determine plant habitats and species. The primary parent rock types around Lake Oroville are granitic, volcanic, metamorphic, and sedimentary. Unique formations include serpentine outcrops located within the West Branch and North Fork arms of the reservoir and gabbro-derived soils located along the South Fork arm of the reservoir. Vernal pools and swale complexes are a common part of the valley grassland habitats downstream of Lake Oroville. These pools are of the northern hardpan type that occurs in areas of hummocky ground on terrace-alluvial derived Redding soils. These formations tend to support a number of endemic and rare plant species.

Botanical field investigations for the FERC relicensing of the Oroville Facilities included surveys for vegetation mapping, noxious weeds, special-status plant species, and riparian and wetland resources. Surveys were conducted during 2002, 2003, and 2004.

The vegetation communities within the Emergency Response and Recovery activity areas that could be impacted by construction activities include upland forest/woodland, upland herbaceous, upland shrub/scrub, disturbed/urban/bare, riparian forest/woodland, riparian shrub/scrub, wetland, open water, aquatic/submerged (descriptions of each community type are available in the FERC DEIS for Oroville Facilities, Docket No. P-2100, Section 3 Environmental Analysis). Invasive and noxious weeds also inhabit nearly all the above listed plant communities. (See Table 7.5-1)

Noxious weed species in the study area are most prolific in the OWA. The species of greatest concern to native riparian and wetland plant communities and wildlife habitat in this area include giant reed, tree of heaven, scarlet wisteria, parrots feather, and Himalayan blackberry. Tree of heaven is intermingled with the valley elderberry, habitat for the federally threatened valley elderberry longhorn beetle (VELB) (discussed in

section 7.9, *Threatened and Endangered Species*) in about 250 acres of the OWA. (Federal Energy Regulatory Commission, 2006)

Table 7.5-1 Vegetation Communities Associated with Emergency Project Areas

Community	Association	CWHR
Aquatic/Submerged	Algae	Lacustrine
	Mixed Aquatic	
	Mosquito Fern	
	Water-mean	
	Water Primrose	
Disturbed/Other	Disturbed	Barren
	Eucalyptus	Eucalyptus
	Gravel Tailings	Barren
	Gravel/Sandbar	Riverine
	Orchard	Deciduous Orchard/Evergreen Orchard
	Pasture	Irrigated Hay Field
	Rock Outcrop	Barren
	Urban	Urban
Open Water	Canal	Riverine
	Lake	Lacustrine
	Pond	Lacustrine
	Riverine	Riverine
Riparian Forest/Woodland	Black Willow Riparian Forest	Valley Foothill Riparian
	Black Willow/White Alder Riparian Forest	
	Cottonwood/Black Willow Riparian Forest	
	Foothill Cottonwood Riparian Forest	
	Fremont Cottonwood Riparian Forest	
	Mixed Willow Riparian Forest	
	Non-native Riparian Forest	
	Valley Mixed Riparian Forest	
	Valley Oak Riparian forest	
	Riparian Shrub/Scrub	
Blackberry/Willow Scrub		
Mixed Riparian Scrub		
Mixed Willow Scrub		
Narrowleaf Willow Scrub		
Non-native Riparian Scrub		
Mixed Chaparral		
Upland Forest/Woodland	Blue Oak-Foothill Pine Woodland	Blue Oak-Digger Pine
	Blue Oak-Foothill Pine Woodland/Chaparral	Blue Oak Woodland
	Blue Oak Woodland	
	Blue Oak Woodland/Chaparral	Blue Oak-Digger Pine
	Foothill Pine-Mixed Oak Woodland	

Community	Association	CWHR
	Foothill pine-mixed Oak Woodland/Chaparral	
	Foothill Pine Woodland/Chaparral	
	Mixed Oak Woodland	Montane Hardwood
	Valley Oak Woodland	Valley Oak Woodland
Upland Herbaceous	California Annual Grassland	Annual Grassland
	Disturbed Grassland	
Wetland	Mixed Emergent Vegetation	Freshwater Emergent Wetland
	Seep/Wet Area	

7.6 Aquatic Resources

7.6.1 Affected Environment

The aquatic environments associated with the Spillways Emergency and Recovery actions include the TDP and the Lower Feather River, below the FBD. The FRFH and the OWA ponds are also discussed in this section. Warmwater and coldwater recreational fisheries are supported in these areas.

Fish species of primary management concern found within the Emergency Project Area include the following special status species:

- Spring-run Chinook salmon (*Oncorhynchus tshawytscha*)
- Central Valley steelhead (*O. mykiss*)
- Green sturgeon (*Acipenser medirostris*)
- Fall-run Chinook salmon (*Oncorhynchus tshawytscha*)
- Sacramento splittail (*Pogonichthys macrolepidotus*)
- Pacific lamprey (*Entosphenus tridentatus*)
- River lamprey (*Lampetra ayresi*)
- Hardhead (*Mylopharodon conocephalus*)
- Species that are recreationally or commercially important: Fall-run Chinook salmon, Central Valley steelhead, American shad (*Alosa sapidissima*), coho salmon (*O. kisutch*), striped bass (*Morone saxatilis*), and four species of black bass.

The overall fish species composition within the TDP and downstream in the Feather River is listed in Table 7.6-1. The table also indicates whether each species is native or introduced, identifies the general geographic distribution of the species by water body, and summarizes both the regulatory and abundance/management status of each species within the project area.

Table 7.6-1. Fish Species typically found within the Thermalito Diversion Pool (TDP) or the Lower Feather River (LFR), below TDP. (Excerpted from (Federal Energy Regulatory Commission, 2006))

Common Name Scientific Name	Regulatory Status¹	California Native or Introduced	Location	Abundance/Mgmt. Status
Pacific lamprey (<i>Entosphenus tridentatus</i>)	FSC	Native	LFR	CDFW watch list
River lamprey (<i>Lampetra ayresi</i>)	CSC FSC	Native	LFR	CDFW watch list
Green sturgeon (<i>Acipenser medirostris</i>)	FT CSC	Native	LFR	Threatened or endangered
White sturgeon (<i>Acipenser transmontanus</i>)	--	Native	LFR	Stable or decreasing
American shad (<i>Alosa sapidissima</i>)	--	Introduced	LFR	Widespread and stable
Threadfin shad (<i>Dorosoma petenense</i>)	--	Introduced	LFR	Infrequently observed
Common carp (<i>Cyprinus carpio</i>)	--	Introduced	TDP LFR	Widespread and expanding
Golden shiner (<i>Notemigonus crysoleucas</i>)	--	Introduced	TDP LFR	Widespread and expanding
Hardhead (<i>Mylopharodon conocephalus</i>)	CSC	Native	TDP LFR	CDFW watch list

Common Name Scientific Name	Regulatory Status¹	California Native or Introduced	Location	Abundance/Mgmt. Status
Hitch (<i>Lavinia exilicauda</i>)	--	Native	LFR	CDFW watch list
Sacramento pikeminnow (<i>Pogonichthys macrolepidotus</i>)	--	Native	TDP LFR	Stable or increasing
Sacramento splittail (<i>Potonichthys macrolepidotus</i>)	CSC FSC	Native	LFR	Special concern
Sacramento sucker (<i>Catostomus occidentalis</i>)	--	Native	LFR TDP	Stable or increasing
Black bullhead (<i>Ameiurus melas</i>)	--	Introduced	LFR	Widespread and stable
Brown bullhead (<i>Ameiurus nebulosus</i>)	--	Introduced	LFR	Widespread and stable
White catfish (<i>Ameiurus catus</i>)	--	Introduced	LFR	Widespread and stable
Channel catfish (<i>Ictalurus punctatus</i>)	--	Introduced	LFR	Widespread and stable
Wakasagi (<i>Hypomesus nipponensis</i>)	--	Introduced	TDP LFR	Widespread and expanding
Fall-run Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	CSC FSC	Native	LFR	CDFW watch list
Spring-run Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	ST FT	Native	LFR	Threatened or endangered
Central Valley steelhead (<i>Oncorhynchus mykiss</i>)	FT	Native	LFR	Threatened or endangered

Common Name Scientific Name	Regulatory Status¹	California Native or Introduced	Location	Abundance/Mgmt. Status
Rainbow trout (<i>Oncorhynchus mykiss</i>)	--	Native	TDP LFR	Widespread and stable
Brown trout (<i>Salmo trutta</i>)	--	Introduced	LFR	Widespread and stable
Brook trout (<i>Salvelinus fontinalis</i>)	--	Introduced	LFR TDP ¹	Widespread and stable
Prickly sculpin (<i>Cottus asper</i>)	--	Native	TDP LFR	Stable or increasing
Riffle sculpin (<i>Cottus gulosus</i>)	--	Native	LFR	CDFW watch list
Striped bass (<i>Morone saxatilis</i>)	--	Introduced	LFR	Widespread and stable
Bluegill (<i>Lepomis macrochirus</i>)	--	Introduced	LFR TDP	Widespread and stable
Green sunfish (<i>Lepomis cyanellus</i>)	--	Introduced	LFR	Widespread and stable or expanding
Redear sunfish (<i>Lepomis microlophus</i>)	--	Introduced	LFR	Widespread and stable
Black crappie (<i>Pomoxis nigromaculatus</i>)	--	Introduced	TDP LFR	Widespread and stable
White Crappie (<i>Pomoxis annularis</i>)	--	Introduced	LFR	Widespread and stable

¹ (CA Department of Water Resources, June 30, 2003)

Common Name Scientific Name	Regulatory Status¹	California Native or Introduced	Location	Abundance/Mgmt. Status
Largemouth bass (<i>Micropterus salmoides</i>)	--	Introduced	TDP LFR	Widespread and stable
Smallmouth bass (<i>Micropterus dolomieu</i>)	--	Introduced	TDP LFR	Widespread and stable
Redeye bass (<i>Micropterus coosae</i>)	--	Introduced	LFR	Localized
Spotted bass (<i>Micropterus punctulatus</i>)	--	Introduced	LFR	Widespread and expanding
Tule perch (<i>Hysterocarpus traski</i>)	--	Native	TDP LFR	Stable

¹FT – Federally Threatened species; FSC – Federal Species of Concern; CSC – State of California Species of Concern.

Thermalito Diversion Pool

The Thermalito Diversion Pool (TDP) extends from Oroville Dam to the TDD. The TDD creates the TDP, which acts as a water diversion point and includes diversion to the Thermalito Power Canal to the west and to the historical Feather River channel known as the Low Flow Channel (LFC) to the south. The TDP is approximately four miles in length and has a storage capacity of 13,350 acre-feet (af) with a maximum water surface area of 320 acres at water surface elevation of 225 feet MSL (crest elevation 233 feet).

The Feather River Fish Barrier Dam (FBD) is downstream of the Thermalito Diversion Dam and immediately upstream of the FRFH. The flow over the FBD maintains fish habitat in the LFC of the Feather River between the FBD and the Thermalito Afterbay outlet (TAO), providing attraction flows for the TAO and for the hatchery. (California Department of Water Resources, 2003). The TAO at RM 59 marks the point of re-introduction of bypassed flows, increasing discharge and beginning the high flow channel (HFC). The HFC extends from the TAO to the confluence with Honcut Creek at RM 44. (Federal Energy Regulatory Commission, 2006)

The FBD is at the upstream end of the LFC and is an impassable barrier to fish directing fish into the fish ladder entrance to the FRFH. Because the FBD is an impassable

barrier to fish, no anadromous or threatened or endangered listed species are naturally present in the TDP (refer to Table 1 for Fish Species Composition). However, Chinook Salmon and Coho Salmon are on the Fish Species Composition list for TDP, as they are planted in Lake Oroville, and through spill events can end up in the TDP.

The water temperature requirements create primarily coldwater fishery habitat in the TDP, which is dominated by coldwater salmonids, including rainbow trout, brook trout, brown trout, and Chinook salmon. Although the TDP is not currently stocked with fish, the lack of barriers between the TDP and the Thermalito Forebay allows fish stocked in Thermalito Forebay to migrate freely into the TDP (Federal Energy Regulatory Commission, 2006).

Feather River Downstream of Oroville Dam

Oroville Facilities releases are managed for many purposes, one of which is to protect and benefit cold-water fisheries. Fish species of primary management concern present in the Feather River include spring-run Chinook salmon, fall-run Chinook salmon, Central Valley steelhead, rainbow trout, green sturgeon, white sturgeon, Pacific lamprey, river lamprey, and Sacramento splittail. Chinook salmon are very abundant in the Feather River as an estimated 20,000 to 200,000 Chinook salmon return to the Feather River annually

Minimum flows and ramping criteria in the Feather River were established in the August 1983 Agreement between DWR and CDFW and in the 2004 National Marine Fisheries Service (NMFS) Biological Opinion for operation of the SWP/Central Valley Project (CVP). The agreement specifies that DWR release a minimum of 600 cfs into the Feather River from the Thermalito Diversion Dam for fisheries purposes. Therefore, the LFC is operated at 600 cfs or greater with variations in flow occurring primarily during flood control releases and in the summer to meet downstream temperature requirements for salmonids. When flows are 2500 cfs or less, down-ramping rates for the LFC are set at 300 cfs/ 24 hours and 200 cfs/24 hours for the high flow channel. In both the low flow and HFC, ramping rates can be exceeded for flood control purposes, mechanical and electrical failures, or due to unusual or major maintenance.

Minimum flows in the HFC of the Feather River from the TAO (RM 59) to the confluence with the Sacramento River (RM 0)) are generally maintained between 1000 and 1700 cfs (based on unimpaired runoff) but can be reduced up to 25% if the reservoir is expected to draw down below 733 feet (approximately 1.5MAF). The HFC is typically reduced to 2,500 cfs or less by October 15 to prevent Chinook salmon redd dewatering during the primary egg incubation period, October 15 through November 30. If the flow exceeds 2500 cfs during this time period, DWR must not reduce the flow by more than 500 cfs below the highest one-hour flow. The flow regime within this reach

varies significantly depending on runoff and month, from a possible low of 750 cfs to flood flows as high as 160,000 cfs. Small flow contributions from Honcut Creek and the Bear River and larger flow contributions from the Yuba River also influence flow in this segment. Shanghai Bench, a clay riffle located between RM 26 and RM 25, had been identified as the most likely natural, flow-related impediment to upstream migration in the Feather River (DWR, 2002d). This bench collapsed in 2012 and no longer appears to effect fish passage.

Water temperatures tend to be coldest in the upper-most portions of the Feather River near the FBD, and warm progressively as they move downstream during the spring, summer, and fall. The LFC water temperatures have been managed to comply with terms of the October 2004 NMFS biological opinion about the effects of the long-term operations, criteria, and plan of the CVP in coordination with operations of the SWP, which superseded all previous biological opinions regarding the CVP and SWP long-term operations, criteria, and plan. (Federal Energy Regulatory Commission, 2006).

Feather River Fish Hatchery

The FRFH facilities include the FBD, a fish ladder, holding tanks, hatchery buildings, and raceways. DWR constructed the FRFH in 1967 to compensate for salmonid spawning habitat lost upstream with the construction of the Oroville Dam. CDFW operates the hatchery. The FRFH uses water diverted from the TDP, which receives cold, hypolimnetic water (which rarely exceeds the mid to high 50s [°F]) from Lake Oroville. The hatchery water intake temperatures are monitored for operational compliance with the 1983 Oroville Operating Agreement between DWR and CDFW.

The fish ladder gates are opened on or about September 15 to allow adult spring-run and fall-run Chinook salmon to enter the hatchery. Spring-run are typically ready for spawning in late September. Fall-run spawning commences on approximately October 8. DWR and CDFW have recently initiated a program to externally mark and return to the river all early returning Chinook and are incorporating only the early run fish into the FRFH spring-run Chinook broodstock. A portion of these marked early run fish (i.e., those that do not return to the hatchery in the fall or are not harvested) spawn naturally in the Feather River (70 FR 37,160). Unmarked fish (no external tag) entering the hatchery are considered fall-run. When the gates are open, upstream migrating fish can move into the 0.5-mile-long ladder leading to the hatchery. All salmon adults entering the hatchery are retained for egg taking or are culled. About 9,000 to 18,000 salmon and 2,000 steelhead are artificially spawned annually, producing 6 million fall-run Chinook salmon, 2 million spring-run Chinook salmon, and 400,000 steelhead

Salmon and steelhead are raised at the FRFH, transported in oxygenated temperature controlled tanks, and released into the Feather River, Lake Oroville, other California

reservoirs, and San Pablo Bay near San Francisco Bay. Chinook salmon are released from the hatchery as young-of-the-year smolts, while steelhead are released to the Feather River as yearlings.

DWR has implemented disease control procedures that minimize both the outbreak of disease in the hatchery and the possibility of disease transmission to wild fish populations (DWR, 2004j). Hatchery operating procedures, such as periodic examinations by fish pathologists and disinfecting procedures are designed to control disease in hatchery stocks. (Federal Energy Regulatory Commission, 2006).

Oroville Wildlife Area Ponds

In general, the OWA contains more than 75 warmwater ponds and sloughs, along with complexes of emergent marsh and flooded cottonwood, willow, and sycamore trees, totaling about 12,000 acres (11,200 acres within the project boundary). The OWA pond water levels are replenished, in part, by the Feather River, which seeps through the porous levees and substrates, or floods into the OWA during high flow events. There are at least four overflow weirs into the OWA in Reach FR-10 between RM 53.5 and 64.0. After the floods in the Feather River in 1997, DWR repaired a levee in the OWA with a culvert that connects flows directly from the Feather River into the OWA, and has resulted in areas of the OWA being permanently inundated. The permanently inundated area increased the amount of potential fish and wildlife habitat in the OWA, but species of invasive aquatic plants are growing to densities that reduce the quality of or eliminate potential fish habitat.

The OWA ponds are currently managed as a warmwater fishery. Sufficient habitat exists in many of the ponds for warmwater game fish, such as largemouth bass, bluegill, redear sunfish, and crappie, to naturally reproduce. No fish are currently being stocked and general fishing regulations apply. The OWA ponds vary in depth and configuration; the deeper ponds stay flooded year-round and contain the primary fishes. However, during some years, some of the shallower ponds and wetland areas contain fish carried into them by floodwaters formed by high river levels or by local runoff during periods of heavy precipitation. These flooding periods raise the water level in the low-lying, flat areas of the OWA such that vast areas of water become directly connected to the river. These high-water events introduce fish to ponds that may ultimately go dry and redistribute fish in the deeper, perennial ponds. This condition is more pronounced during very high releases from Lake Oroville.

Largemouth bass, channel catfish, white catfish, bluegill, green sunfish, and carp are all abundant in the OWA ponds, along with populations of black and white crappie. Electrofishing on Robinson Borrow Pond (also called Granite Pond) in April 2003 collected carp, Chinook salmon, largemouth bass, and Sacramento sucker.

The OWA ponds and wetland areas become too warm during the late spring to sustain salmonids, so any salmonids that are present at that time typically do not survive. The extent of this periodic salmonid presence and the stranding effect has not been determined. (Federal Energy Regulatory Commission, 2006)

For additional information on the fish species within the Emergency Project Area please see the FERC DEIR, Environmental Analysis Section 3.

7.7 Environmental Effects to Terrestrial and Aquatic Resources

Construction during the Recovery and Response phases of the Oroville Spillway Emergency will both temporarily and permanently disturb land, vegetation, and aquatic resources within the Project Area. Upwards of 300+ acres of terrestrial habitat have been potentially impacted within the proximity of the spillways. In addition, the project has temporarily and may permanently disturb habitat and displace wildlife, aquatic and avian species, during the following activities:

- Vegetation clearing
- Construction for access roads, work pads, staging areas and spoil sites
- Spillways reconstruction
- In-water debris removal
- Land-based debris removal
- Emergency shoofly line installation and wreck-outs
- 13.8kV powerline and associated fiber optic communication system replacement
- 230 kV powerline alignment relocation
- Eagle's nest removal
- Radial gates maintenance
- Excavation of borrow material
- Feather River Fish Hatchery response and recovery actions
- Boundary fence installation
- Miscellaneous Oroville recovery actions

In general, land clearing activities have the potential to cause loss of wildlife habitat due to habitat disturbance and/or removal, increased noise and vibrations, increased dust and air pollution, and increased vehicle strikes and other human interactions with wildlife. Most of the activities described below would have first required vegetation clearing to occur prior to the subsequent action and thus a large majority of the potential environmental impacts would have occurred during the land clearing process and less so during the action itself, unless otherwise described.

7.7.1 Vegetation Clearing

Upwards of 300+ acres of vegetation within the Project Area has been removed or disturbed as a part of the Oroville response and recovery actions. Vegetation clearing and grubbing has the potential to disturb and/or displace nesting birds, injure nestlings, disturb or destroy animal burrows and habitat and disturb and/or remove mature vegetation communities and special status plant species. Vegetation clearing within riparian areas has the potential to reduce shaded aquatic habitat and provide increased opportunities for bank erosion and contribute to turbidity increases within the TDP. In addition, the disturbance and removal of existing vegetation has the potential to create conditions conducive to the introduction and spread of invasive plant species, which could out-compete and displace native species, thereby reducing biodiversity and altering compositions of existing native communities.

The environmental permits DWR received to proceed with this type of work included:

- Migratory Bird Treaty Act Permit (No. MB30372C-5) for the relocation of up to 25 nests within the FERC boundary (United States Fish and Wildlife Service, June 8, 2017-March 31, 2018);
- Bald and Golden Eagle Protection Act (BGEPA) Take Permit (No. MB22883C-0), for health and safety purposes (United States Fish and Wildlife Service, February 17, 2017-August 31, 2017);
- BGEPA Nest Take Permit (No. MB53028C-0) (United States Fish and Wildlife Service, September 7, 2017-December 31, 2017), for hazard tree removal containing nests.

7.7.2 Access Roads, Work Pads, Staging Areas and Spoil Sites

The improvement and/or creation of access roads, stockpile locations, work pads and staging areas first required clearing and grubbing of vegetation. This activity has the potential to impact plant and wildlife habitats, increase injury or mortality due to increased vehicular traffic, noise, and human presence. Working at night time increases the potential for nocturnal species encounters, including injury or mortality due to collisions. The soil compaction that results from these types of activity may hamper natural re-vegetation and therefore reduce biodiversity.

In coordination with USFWS, two valley elderberry shrubs were removed during these activities. These impacts are covered under Section 7.10.2.2.2.

The environmental permits DWR received in order to proceed with this type of work included:

- Emergency Regional General Permit (RGP 8) (No. SPK-2017-00264) – Burma Road (United States Army Corps of Engineers, March 28, 2017-September 28, 217)
- Clean Water Act (CWA) Section 401 Water Quality Certification (WQC) (WDID# 5A04CR00266) – Burma Road (Central Valley Regional Water Quality Control Board)
- RGP 8 (No. SPK-2017-00444) - Lakeside Spillway Road Improvements and Construction (United States Army Corp of Engineers, 2017)
- CWA Section 401 WQC (WDID#5A04CR00269a) – Lakeside Spillway Road improvements and construction (Central Valley Regional Water Quality Control Board, 2017)
- CWA Section 404, Nationwide Permit 33 (non-reporting) – Continued Lakeside Spillway road improvements and construction (United States Army Corps of Engineers, 2017)
- CWA Section 401, WQC 5A04CR00278 – Continued Lakeside Spillway Road Improvements and Construction Activities (Central Valley Regional Water Quality Control Board, 2017)

7.7.3 Spillways Reconstruction

The actions associated with the FCO and Emergency Spillways first involved the clearing and grubbing of vegetation and the creation of access roads, staging areas and stockpile locations. See Sections 6.1 and 6.2 for an explicit listing of the main spillway actions. These actions further involved the blasting of bedrock and the proposed removal of ~370,000 cy of rock, as explained in Section 6.7.2 Spillway Left-Borrow Site Excavation. Reconstruction within the spillways, therefore, has the potential to impact local wildlife due to the disturbance or destruction of burrows and nesting habitats, increased dust, and thus air quality concerns, along with the increased vehicular traffic, night work and potential impacts associated with vegetation clearing and constructing of access roads, staging areas and stockpile locations.

7.7.4 In-Water Debris Removal

Approximately 2.2 million cy of debris was washed into the TDP. An estimated 1.4 million cy of accumulated sediment and concrete material has been removed. The excavated material has been stockpiled at three separate spoil pile locations throughout the project area. Prior to the stockpiling of debris material, the spoils locations required vegetation clearing and grubbing and thus may have impacted plant and wildlife habitat, as explained in Section 7.6.1 *Vegetation Clearing*. Activities within the TDP that occurred during both the Response and Recovery phases created increased turbidity,

high flows, debris, siltation and temporary blocking of the channel. Turbidity was monitored at various locations along the TDP and did not exceed thresholds for extended periods of time.

Debris removal from the TDP has the potential to increase disturbance to aquatic species, including common waterfowl, amphibians, fish and wetland plant species due to heavy equipment operations within the TDP, changes to water quality both locally and downstream, bed and channel disturbance, and hazardous material spills.

During the event, daily site visits were made to various locations along the TDP by an Environmental Scientist(s) for such activities as water quality monitoring and daily environmental inspections. Site inspectors, contractors, and other various staff working near and on the water from vessels and barges also conducted site inspections during their work activities and reported any issues to the Environmental Compliance group. During these site visits, no fish mortalities were observed, therefore it is assumed that the in-water debris removal activities did not have a significant effect on the TDP fisheries. Fish may have migrated downstream, adapted to the changing environment, or found refuge in low turbidity areas during the activities as they would do in naturally occurring storm events.

Environmental permits received to proceed with the In-water Debris Removal include:

- RGP 8 (No. SPK-2017-00153) (United States Army Corps of Engineers, 2017)
- CWA Section 401 WQC (WDID#5A04CR00265) (Central Valley Regional Water Quality Control Board, 2017)
- RGP 8 (No. SPK-2017-00153) extension (United States Army Corps of Engineers, 2017)

7.7.5 Land-Based Debris Removal

Debris that remained on the hillside from the damaged FCO Spillway and debris left from the overland flows from the emergency spillway were removed to prepare the site for reconstruction. Potential impacts related to this land-based debris removal included those impacts related to vegetation clearing in Section 7.7.1 and the building of access roads as in Section 7.7.2.

7.7.6 Emergency Shoofly Line Installation and Wreck-Outs

The installation of the emergency shoofly lines and poles over the spillway required vegetation removal and clearing and thus may have potentially impacted plants and wildlife and/or disturbed or destroyed habitat as a result of habitat disturbance and/or removal, increased noise and noise vibrations, increased dust and the potential for vehicle collisions and other human interactions with wildlife.

The removal, or “wreck-out”, of the shoofly line, the associated poles, and the original lattice towers that were part of the permanent alignment over the FCO Spillway may have a lower level of wildlife disturbance since the removal of or ‘wreck-outs’ will occur outside of the bird nesting season, and during daylight hours. Wildlife may potentially be affected by increased noise and vehicular traffic that may occur as a result of pole/lattice tower and/or line removal activities. If the poles remain into the next nesting season, removal may potentially impact nesting and /or roosting habitat.

7.7.7 13.8kV Powerline and Associated Fiber Optic Communication System Replacement

Installation of the 13.8kv powerline and fiber optics communication line may entail vegetation trimming and clearing, trenching and/or directional drilling, water crossings, increased vehicular traffic, and resulting noise and dust generation. Wildlife impacts may result from the removal and/or disturbance of underground burrows, terrestrial habitat disturbance and/or removal, disturbance or removal of vegetation during the migratory bird and special status bird species nesting season, aquatic species disturbance due to low level vibrations and/or habitat disturbance, and increased traffic and noise. Special status botanical species (*Clarkia biloba* ssp. *brandegeae*) may be impacted by activities associated with the installation of the powerline and fiber optic cable at the northwest-west end of the trenching corridor. Through avoidance, minimal trimming/removal, placement of the lines underground, shallow trenching in locations and working in the middle of roadways, impacts to Waters of the US and riparian areas can be minimized or avoided entirely. All appropriate environmental laws, regulations, minimization and mitigation requirements will be adhered to.

7.7.8 230 kV Powerlines – Eagle Nest Removal

A review of the new 230kV alignment by a qualified forester for “Danger Trees” was conducted to determine if remaining trees posed reliability and safety risks to the powerlines. Clearing standards for Right of Way (ROW) construction and maintenance were based on North American Electric Reliability Corporation (NERC) requirements and included the identification and removal of trees located outside the clearing boundaries that pose a potential risk to the transmission lines (i.e., Danger Trees).² Individual Danger Trees were initially identified via LiDAR data and Power Line Systems Computer Aided Design and Drafting (PLSCADD)³ modeling analysis and then verified in the field. Factors for selecting Danger Trees for removal included tree species, overall

² Danger, or hazard trees, are trees outside the clearing boundaries which could affect safe operation of the lines should they fall. Identification is based on safe clearance from (1) falling trees to an “at-rest” position; (2) swung conductors to standing trees; (3) trees growing into the conductors (estimated 20 feet in 10-year period for all species). Danger Trees are identified on Strip Maps and marked in the field.

³ www.powline.com

height, form (e.g., excessive branching and/or leaning), and vigor, as well as adjacent slope aspect and gradient. During this process, a bald eagle nest tree, known as the Glen Pond Nest, was identified in the modeling analysis as a Danger Tree and then subsequently confirmed in the field.

Therefore, following fledging and the adult Eagles vacating the nest for the season, DWR applied for and obtained an Eagle Nest Take Permit (Permit Number: MB53028C-0, expires 12/31/2017). This permitted DWR to remove the eagle nest on September 15, 2017.

Considering the weight of the nest, the need for additional construction access and crane pads for potential eagle nest relocation, the potential impacts to surrounding habitat, the questionable integrity of surrogate trees, the potential inability to handle the additional weight, and overall safety, it was determined that relocating the nest was not feasible. DWR consulted with the USFWS and proposed to install up to four surrogate nest structures utilizing material from the secondary nest. This approach was accepted via email correspondence on November 6, 2017. DWR has also received an Eagle Nest Exhibition Permit from the USFWS to display the primary nest at the Lake Oروville Visitor Center.

The surrogate structures were installed on November 28, 2017 and on or about December 12 and 13, 2017. A nest evaluation and selection process was developed to locate candidate trees within DWR owned property, in relative proximity to the original nest location. Characteristics that were assessed included:

- Prominence – high ridge trees with clear, unobstructed views of the TDP
- Form – high or super-canopy trees with upper nest crotches or branching that facilitate nest enhancements, including sufficient perch locations
- Health/Vigor – a healthy, sufficiently sound tree free from obvious disease and insect concerns
- Safe Access – the ability for tree and ground support staff to safely work around a candidate tree during artificial nest construction and installation

Impacts include bald eagle habitat loss, and vegetation removal. Mitigation for this loss includes the installation of up to four surrogate nest structures plus the ‘cleaning up’ of one prominent tree to potentially facilitate eagle use for nesting. The nest installation was designed with little ground disturbance activity beyond minor foot traffic and tree climbing.

Environmental permits received for this work are listed under Section 7.7.1 above.

7.7.9 Excavation for Borrow Material

The Oroville Wildlife Area is a likely source of additional material for use as pervious backfill in the construction of the FCO Spillway. This action may have potential terrestrial wildlife impacts due to increased vehicular traffic within the wildlife area both during the day and at night as well as increased dust and potential impacts to air quality due to the estimated >5,500 truck trips. The specific areas being evaluated are within or near aquatic and upland habitat for the federal and State listed Giant Garter Snake (GGS) and the federally listed Valley Elderberry Longhorn Beetle (VELB). The FERC relicensing surveys mapped GGS habitat, VELB habitat and Yellow Billed Cuckoo (YBCC) habitat in Area 'A' of the OWA. Specific sites within Area 'A' are being evaluated and proposed for excavation of material that will be used for the pervious backfill. These sites are referred to as OWA Site 1 and OWA Site 2. Excavation activities may begin as soon as mid-January 2018. In coordination with USFWS and CDFW, appropriate avoidance, minimization and mitigation measures will be implemented and may vary based on the site chosen.

Though habitat for the Yellow Billed Cuckoo (identified as large swaths of mature trees with associated understory) was mapped near the OWA Area 'A', the identified project activities will not come close to or impact habitat for this species.

7.7.10 Radial Gates Maintenance

The FCO Radial Gates structure is a known nesting location for swallows. Repair work on the gates was delayed until after the nesting season. Per compliance with the MBTA, the nests were knocked down prior to work commencing. Access and staging for these repairs are within the lakebed of Lake Oroville, thus requiring CWA permits. A list of the permits obtained for these actions are provided in Section 7.7.2- Access Roads, Work Pads, Staging Areas and Spoil Sites, for the Lakeside Spillway Road Improvements and Construction.

Repairs to the TDD Radial Gates will entail the use of already existing access routes. Gate removal will occur over the water utilizing heavy equipment. It is anticipated that repairs will occur at a designated and already disturbed staging location within the Project Area, near the TDD. Further details are unknown. This activity may also affect nesting birds and may cause a slight and temporary disturbance within the water depending upon how the gates are removed. It is anticipated that any fish within the area will move due to the disturbance.

7.7.11 Feather River Fish Hatchery-Response and Recovery Actions

It is known that elevated levels of suspended sediment are associated with negative effects to salmonid spawning, growth, and reproduction processes (University of

Washington, 2001). Elevated sediment in hatchery water can: smother eggs and deprive the embryos of required oxygen to survive and develop; reduce juvenile feeding success, leading to reduced growth rates; gill trauma; and disruption of homing performance. These effects can impact salmonids in both the hatchery and natural environment.

In order to respond as necessary to the spillway emergency and the resulting potentially harmful levels of dissolved oxygen and turbidity that could affect the health and survival of eggs and fry housed at the facility, CDFW staff began monitoring for such effects within the FRFH on February 9, 2017. Monitoring continued until May 17, 2017.

7.7.12 Boundary Fence Installation

A five-strand barbed wire fence was installed in March to keep cattle out of the Project Area. A six-foot swath of vegetation was cleared and holes were excavated for post placement. The project could have potentially impacted habitat for nesting birds, terrestrial wildlife, including burrow habitats. Biological monitors were onsite to conduct pre-construction nest surveys, daily construction inspections, and worker education regarding best management practices. Any impacts were temporary in nature and will be mitigated through a Project area-wide planting/revegetation plan.

The fence crosses several drainages; however, material was not removed from, nor placed into these drainages and thus, the fence did not affect these drainages.

7.7.13 Miscellaneous Oroville Recovery Actions

The Recovery also included miscellaneous activities occurring within areas that had already been disturbed either by previous Response and Recovery activities or by initial construction of the Oroville Facilities. Because these activities occurred within previously disturbed areas, they had negligible effects on terrestrial wildlife resources.

7.8 Agency Coordination, Public Involvement and Permits for Terrestrial and Aquatic Species

DWR has sought consultation and/or compliance for the following environmental laws and regulations:

- National Environmental Policy Act (NEPA)
- California Environmental Quality Act (CEQA)
- National Historic Preservation Act (NHPA)
- California Endangered Species Act (CESA)

- Federal Endangered Species Act (FESA)
- California Fish and Game Code
- Clean Water Act (CWA)
- Rivers and Harbors Act
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act (BGEPA)

The list of those agencies that DWR has consulted with for compliance with these environmental regulations includes:

- Federal Energy Regulatory Commission (FERC)
- Federal Emergency Management Association (FEMA)
- California Office of Emergency Services (Cal OES)
- United States Fish and Wildlife Service (USFWS)
- USFWS National Eagle and Wildlife Repository
- United States Army Corps of Engineers (USACE)
- Central Valley Regional Water Quality Control Board (CVRWQCB)
- California Office of Historic Preservation (Cal OHP)
- State Historic Preservation Officer (SHPO)
- National Marine Fisheries Service (NMFS)
- California Department of Fish and Wildlife (CDFW)

Environmental Permits are discussed in Section 7.7 as they relate to each activity.

7.9 Best Management Practices

To the extent possible, best management practices (BMP) have been enlisted prior to and during construction activities to reduce environmental impacts. BMPs include but are not limited to:

- Full time environmental monitoring and pre-project surveys (e.g., nesting bird surveys prior to tree felling)
- Onsite weekly environmental awareness training for new personnel (i.e. W.E.A.P or Worker Environmental Awareness Program training)
- Nesting and/or juvenile migratory bird relocation efforts to a wildlife sanctuary (per requirements of MBTA permit)
- Implementation of site specific speed limits
- Dust control measures (e.g. water trucks)
- Preservation of existing vegetation where feasible (e.g. retaining riparian vegetation as much as possible)

- Erosion control materials (e.g. silt fencing, sediment basins, fiber rolls, gravel bag berms, straw bale barriers, hydro-seeding)
- Clearly delineated exclusionary areas for environmentally sensitive sites
- Solid waste management
- Blasting alarms/notifications
- Temporary and/or permanent culvert installations
- Regular vehicle maintenance to prevent leaks
- Locating equipment maintenance and fueling areas away from waterways
- Implementation of Storm Water Pollution Prevention Plan(s)
- Implementation of Dredging Water Quality Plan
- Watercraft decontamination procedures for invasive species
- Site stabilization, habitat restoration and revegetation plan, including soil de-compaction and utilization of felled logs for slope stabilization and habitat improvements
- Measures implemented at FRFH are included in Section 7.7.11.

Since sufficient habitats exist in the immediate surrounding areas and adjacent to the project area, the majority of wildlife and avian species are expected to temporarily disperse to less disruptive locations. The construction-specific effects should be temporary and should not create long-lasting adverse effects. Implementation of BMPs and the fulfillment of permit requirements should reduce the overall effects on terrestrial resources within the project area. Effects to vegetation and wildlife should be considered temporary in nature and not present an adverse effect to the terrestrial environment. Upon the completion of construction activities, restoration activities will take place to accelerate the return of pre-project conditions.

7.10 Threatened and Endangered Species

7.10.1 Affected Environment

A list of federally-listed species that have the potential to occur in the project area was generated from various sources. The list below utilizes the lists generated during the Oroville Facilities relicensing studies and has been updated with data from the California Natural Diversity Database (California Department of Fish and Wildlife, 2018) and a September 2017 USFWS online IPaC database generated list. Table 7.10-1 below provides a list of the federally listed species and critical habitat that may occur within the project area:

Table 7.10-1. Federally listed species with potential to occur in the project area.

Species	Federal Status	State Status
<i>Birds</i>		
Southern bald eagle (<i>Haliaeetus leucocephalus</i>)	D	SE
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	T	E
Least Bell's vireo (<i>Vireo bellii pusillus</i>)	E	E
<i>Reptiles</i>		
Giant Garter Snake (<i>Thamnophis gigas</i>)	T	ST
<i>Amphibians</i>		
California red-legged frog (<i>Rana draytonii</i>)	T	—
California Tiger Salamander (<i>Ambystoma californiense</i>)	T	T
Sierra Nevada Yellow-legged Frog (<i>Rana sierrae</i>)	E	T
<i>Fish</i>		
Delta Smelt (<i>Hypomesus traspacificus</i>)	T	E
Steelhead – Central Valley DPS (<i>Oncorhynchus mykiss</i>)	T	—
Chinook Salmon – Central Valley Spring-run ESU (<i>Oncorhynchus tshawytscha</i>)	T	T
Green Sturgeon - Southern DPS (<i>Acipenser medirostris</i>) -	T	—
<i>Insects</i>		
Valley Elderberry Longhorn Beetle (<i>Desmocerus californicus dimorphus</i>)	T	—
<i>Crustaceans</i>		
Conservancy Fairy Shrimp (<i>Branchinecta conservatio</i>)	E	—

Species	Federal Status	State Status
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	T	—
Vernal Pool Tadpole Shrimp (<i>Lepidurus packardi</i>)	E	—
Flowering Plants		
Butte County Meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>Californica</i>)	E	SE
Greene's Tuctoria (<i>Tuctoria Greenei</i>)	E	SR
Hairy Orcutt Grass (<i>Orcuttia pilosa</i>)	E	SE
Hoover's Spurge (<i>Chamaesyce hooveri</i>)	T	—
Layne's Ragwort (<i>Packera layneae</i> = <i>Senecio layneae</i>)	T	SR
Slender Orcutt Grass (<i>Orcuttia tenuis</i>)	T	E
Hartweg's golden sunburst (<i>Pseudobahia bahiifolia</i>)	E	SE
Pine Hill flannelbush (<i>Fremontodendron decumbens</i>)	E	SR
Critical Habitat		
Birds		
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Proposed	—
Amphibians		
California Red-legged Frog (<i>Rana draytonii</i>)	Final designated	—
Fish		
Chinook Salmon (<i>Oncorhynchus tshawtscha</i>) - Central Valley Spring Run ESU	Final designated	—
Steelhead (<i>Oncorhynchus mykiss</i>) Northern CA DPS	Final designated	—

Species	Federal Status	State Status
<i>Crustaceans</i>		
Conservancy Fairy Shrimp (<i>Branchinecta conservatio</i>)	Final designated	—
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	Final designated	—
Vernal Pool Tadpole Shrimp (<i>Lepidurus packardi</i>)	Final designated	—
<i>Plants</i>		
Butte County Meadowfoam (<i>Limnanthes floccose</i> ssp. <i>Californica</i>)	Final designated	—
Greene’s Tuctoria (<i>Tuctoria greenei</i>)	Final designated	—
Hairy Orcutt Grass (<i>Orcuttia pilosa</i>)	Final designated	—
Hoover’s Spurge (<i>Chamaesyce hooveri</i>)	Final designated	—

7.10.2 Environmental Effects

7.10.2.1 Species not impacted by Project Actions

The USFWS issued a Biological Opinion (BiOp) on April 9, 2007 for the Oroville Facilities Relicensing Project (FERC 2100), Butte County, California, that addressed the effects of issuing a new license for the Feather River Project on federally-listed threatened and endangered species (United States Fish and Wildlife Service, 2007). The National Marine Fisheries Service issued a separate Biological Opinion on December 5, 2016, which identified critical habitat for Central Valley spring-run Chinook salmon, California Central Valley steelhead, and the Southern distinct population segment of North American green sturgeon in the Feather River extending upstream to the Fish Barrier Dam but no farther (National Marine Fisheries Service, 2015).

DWR conducted habitat surveys during the relicensing process for the Feather River Project, and a review of those surveys was performed to determine the potential for threatened and endangered species habitat to occur within the project area. The Oroville Emergency Response and Recovery Actions will not impact the following species, and therefore, they will no longer be discussed in this document:

- The project area does not contain nor will it impact vernal pools and their associated species. This includes: Conservancy Fairy Shrimp, Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp; California Tiger salamander; Butte County Meadowfoam, Greene's Tuctoria, Hairy Orcutt Grass, Hoover's Spurge, and Hartweg's Golden Sunburst.
- No serpentine or Gabbro-derived soils are located in the project area near Oroville Dam or downstream along the Thermalito Diversion Pool or Oroville Wildlife Area. These soils do exist in the FERC Project boundary along the shores of Lake Oroville in the vicinity of the North Fork, West Branch of the North Fork and the South Fork of the Feather River. However, there is no potential habitat for Layne's ragwort and Pine Hill flannelbush in the Oroville Emergency Response and Recovery Project Area and they will not be impacted by construction activities.
- According to previous surveys, see USFWS 2004, the Yellow-billed cuckoo may be found within the FERC Project boundary, however, habitat does not exist along the TDP. Habitat does exist within the OWA; however, this area is more than ¾ of a mile south of OWA-2 and thus will not be impacted by construction activities.
- The 2007 USFWS BiOp states that although suitable habitat for California red-legged frog (CRLF) exists within the FERC Boundary this species is not currently known to occur within the FERC project boundary. They are, however, known in the North Fork drainage, upstream of the Oroville Dam. Thus, the emergency actions will not impact CRLF.
- According to the USFWS 2004 Biological Assessment, habitat for the mountain yellow-legged frog does not occur within the FERC Project Boundary based upon the elevation distribution of this species.
- Delta smelt do not occur within the FERC Project boundary. In studies conducted by CDFW, DWR, and the Bureau of Reclamation, larval and juvenile Delta smelt were collected from Roe Island in Suisun Bay north to the confluence of the Sacramento and American Rivers. (United States Fish and Wildlife Service, 2004)
- The Least Bell's Vireo has not been found within the FERC Project Boundary and therefore is not expected to be impacted by the Oroville Emergency Response and Recovery Actions.

The emergency project does have the potential to impact the following federally protected species:

- Southern bald eagle (*Haliaeetus leucocephalus*)
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

- Giant garter snake (*Thamnophis gigas*)
- Chinook salmon (*Oncorhynchus tshawtscha*)
- Steelhead (*Oncorhynchus mykiss*)
- Green sturgeon (*Acipenser medirostris*)

7.10.2.2 Federally Protected Species Potentially Impacted by Project Actions

7.10.2.2.1 Southern Bald Eagle

The USFWS listed the southern bald eagle as an endangered species in March 1967. After a federal status review, the species was down-listed to threatened in 1995 (60 FR 35999) (United States Fish and Wildlife Service, 2004). The bald eagle was federally delisted in 2007 (72 FR 37345). In California, this species is currently State-listed as endangered and a Fully Protected Species. The protections provided to the bald eagle under the federal BGEPA, the federal Migratory Bird Treaty Act (MBTA), and the California Endangered Species Act will continue to remain in place.

Bald eagles historically nested throughout California near sea coasts, major rivers, and lakes. More than 160 pairs currently nest in California (up from 28 pairs in 1978) while hundreds of additional bald eagles migrate into California during the winter. Nesting habitat is described as old-growth trees and snags in remote mixed stands near water (Zeiner et al., 1990). In a 1979 survey of 95 bald eagle nest sites in northern California, 87 percent were in dominant or co-dominant ponderosa pine or sugar pine (Lehman). Associated stands were generally open (less than 40 percent canopy cover) and within 1 mile of a water body. About one-third of the nest sites were within 0.1 mile of a water body, and 85 percent of the nests had an unobstructed view of the water body. Seventy percent of the nests were associated with reservoirs.

In addition to the Glen Pond nest, four active bald eagle nest territories currently exist within the project boundary, with one additional active nest territory present on the North Fork upstream of the project boundary. Three active nests are along the shoreline of Lake Oroville and one is on the Feather River in the southwest portion of the OWA.

Population monitoring (2002 through 2004) indicates that reproduction (1.0 fledgling/active nest) meets the FWS' Bald Eagle Pacific Recovery Plan goals (FWS, 1986). Winter bald eagle surveys indicate that Lake Oroville receives extensive wintering use by both adult and immature eagles; however, other project aquatic habitats receive relatively minor wintering bald eagle use (DWR, 2004b). DWR has implemented conservation measures in response to the draft programmatic biological assessment. These include measures designed to protect bald eagle nesting territories by prohibiting human activity near the nests. These measures include the following: (1) administrative closure of land and shoreline areas to human entry during the nesting season around the four bald eagle nest territories; (2) signage, patrol, and enforcement

of closure; (3) nest and population surveys; (4) habitat improvement measures; and (5) limitations on current and future habitat disturbance. DWR also has prepared and implemented bald eagle territory management plans for the four bald eagle territories currently active on or within 0.25 mile of project lands. (Federal Energy Regulatory Commission, 2006)

Biology and Ecology

Although no data have been summarized for more recent years, the upward trend in nesting population appears to be continuing. In northern California, bald eagles are year-round residents (USFWS 1986; pers. comm., M. Perkins 2004). Hundreds of additional bald eagles migrate into California during the winter from nesting territories throughout Washington, Oregon, Alaska, and Canada.

In most of California, the breeding season lasts from about January through July or August (CDFW Website). Females lay between one and three eggs; two is the most common clutch size (Stalmaster, 1987). Both the female and male incubate the eggs; incubation typically lasts about 35 days. Both parents bring prey back to the nest to feed the eaglets; one study documented as many as seven items brought to one nest in one day (Stalmaster, 1987). Chicks fledge when they are 11 or 12 weeks old. Fledglings disperse from the nest area as early as several weeks after fledging.

Bald eagle nesting territories vary greatly in size. Various estimates include: 0.06 square miles (mi²) in eastern Canada (Gittens, 1968), 0.09 mi² in Alaska (Hensel and Troyer 1964), 0.42 mi² in Minnesota (Mahaffy 1981), and 0.60 mi² in Michigan (Mattsson 1974). The most typical territory size is likely 0.4 to 0.8 mi² (Stalmaster, 1987). Eagles normally do not build a nest within 0.6 mi of another occupied nest, although there are exceptions. Territory shape can be nearly circular to oval, to almost linear, depending on the configuration of trees and water. Lake Britton in Shasta County has one of the highest known nesting densities, with average distances between territories of 1.5 mi. (Detrich 1980).

The FERC Action Area provides both nesting and wintering habitat for the bald eagle, as described below. The following information is specific to the Glen Pond Nesting Territory Management Plan as this is the eagle pair potentially impacted by the Oroville Emergency Response and Recovery actions.

Glen Pond Nesting Territory

The following information is taken from the Lake Oroville Bald Eagle Management Plan for the Glen Pond Nesting Territory (CA Department of Water Resources, 2007). The nest tree at this location was removed because it was identified as a hazard tree to the

new alignment of the 230 kV Powerlines. Please refer to the Management Plan for further detail and figures.

Under Section 10(a)(2) of the Federal Power Act, FERC must consider “comprehensive plans” developed by state agencies or agencies authorized by federal law. ESA recovery plans and resource/land management plans adopted by agencies, as well as biological opinions on other actions in the same geographic area, may influence FERCs consideration of a license application. The 2007 USFWS BiOp states that DWR’s eagle management plan, “...will be implemented for all of the known active bald eagle nesting territories located within the proposed project boundary [i.e. FERC boundary], in coordination with [CDFW] and the Service.” Thus, DWR agreed to develop a Bald Eagle Nest Territory Management Plan for any newly discovered nest territories within 30 days of the territory’s discovery. The plan(s) are to be revised as needed based on nest monitoring results over the first breeding season of use.

The Glen Pond Nesting Territory was discovered in 2007. It is this nesting territory that is impacted by construction activities related to the Oroville Emergency Recovery Actions.

The nest was located east of Glen Pond on the southern ridge of the TDP (T 19 N., R 3 E., NE ¼ Section 3.). The physical setting of the nest territory is rolling foothill pine/black oak woodland with a northerly aspect. Slope is variable but generally ranges from 15 to 20 percent with the base of the nest tree at an approximate elevation of 370 feet.

Land ownership within this territory is a mixture of state and private land. The nest tree is located on private property owned by PG&E and is immediately adjacent to state land owned by DWR. The state land is maintained and operated by the California Department of Parks and Recreation (DPR). No livestock grazing occurs on the State or PG&E land at the time of this report.

Foothill pine and black oak comprise the dominate overstory, with an understory of live oak, buckbrush, and poison oak. Overstory is moderate with an average canopy cover near the nest of 30 percent. Several small clearings are found within this territory and consist of grasses and star thistle. There are a very limited number of suitable nest trees within the territory. Very little fire fuel accumulation is present.

Only one nest was present within this territory. The nest tree was a mature foothill pine with an approximate height of 175 feet. The dimensions of the nest were obtained upon removal of the nest, intact. The nest dimensions averaged 6.5’ width and 4.8’ depth. The nest had good canopy cover and was located approximately 480 feet from the south bank of the TDP in a small stand of mature foothill pines.

The TDP is a day use recreation area and receives use by kayakers, car-top boats, and shoreline fishermen. No public motorized watercraft or hunting is allowed. Multiuse trails run adjacent to the north and south banks of the TDP. These multiuse trails are used by hikers, mountain bikers, and equestrians. In addition, the Brad Freeman Trail is accessible by vehicle and is used by DWR, DPR, and PG&E staff to access the area. The TDP fishery consists of cold water salmonids including rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*).

History

This nest was first discovered in January 2007 by DWR staff surveying for the nationwide mid-winter bald eagle survey. No adult bald eagles were observed in the territory during this survey; however, DWR staff observed two adult bald eagles exhibiting nesting behavior within the territory one week later.

Monitoring

Monitoring Lake Oroville and the Thermalito Complex (TDP, Forebay, and Afterbay) for new, as well as known, nesting territories occurs annually from February through July by DWR staff. Early in the season (February through April) the entire shoreline is surveyed by boat and truck, surveying all potential nest trees. If nest territories are located, reproduction, foraging areas and field assessments of potential for project related effects are monitored.

As specified in the 2006 Biological Opinion, DWR will develop a Bald Eagle Nest Territory Management Plan for any newly discovered nest territories within 30 days of the territories discovery. The plans will be revised as needed based on nest monitoring results over the first breeding season of use.

Environmental Effects to Southern Bald Eagle

The Glen Pond Territory eagle pair has nested in the same tree consecutively for the last 10 years. Though construction activities for the reroutes of the 230kV powerlines continued by both DWR and PG&E throughout the eagle nesting season, the eagle pair successfully reared one juvenile that fledged in June 2017.

DWR biologists first observed the use of this nest site, the “Glen Pond” nest, by bald eagles in 2007, but breeding has not always been successful (DWR Ryan Martin, Pers Comm). During the initial response activities, DWR biologists requested an eagle take permit for Health and Safety Reasons (Permit No. MB22883C-0), 10 days following the Oroville Spillway Emergency, as it was expected that the eagles would, once again, utilize the nest in the Glen Pond tree. The nest was located approximately 20 feet from the top of the tree in a large fork leaning westerly toward the DWR right of way (ROW).

The resident pair returned in the spring of 2017 and produced a single eaglet that successfully fledged on or about June 5, 2017. The use of the nest site was continually monitored and documented by biologists from DWR, PG&E, and the consulting staff hired for environmental compliance purposes as part of the actions related to the spillway, dredging and powerlines projects during emergency response and recovery.

The nest was located in the upper portion of a prominent, approximately 175 feet high, forked foothill (or gray) pine (*Pinus sabiniana*) situated east of Glen Pond on the southern ridge of the TDP (See Appendix B, Figure 7.10-1 for a location map, and Appendix A, Figure 7.10-1 for a recent photo of the tree). The nest tree was positioned within a small stand of blue oak (*Quercus douglasii*) and gray pine situated along the eastern edge of a cleared access road, east of the DWR permanent reroute structures P/Q7 and P/Q8, on private property owned by PG&E. The tree itself was in a mature, declining stage with several large branches either missing or broken, and scattered, dead, smaller branches within the upper canopy. The nest site was immediately adjacent to State land owned by DWR. The nest is approximately 6.5 feet in diameter, 4.8 feet in depth and composed of tightly woven small to medium sized branches (estimated maximum base diameter <1.3 inches). The nest was located approximately 20 feet from the top of the tree in a large fork leaning westerly toward the new 230 kV ROW. A smaller, alternate nest was constructed on a separate large fork of the same tree by the resident pair in 2017 and generally leans in the opposing direction towards an underground fiber optics line reroute currently under construction.

PG&E determined that should the tree fail and fall over, there would be a high risk of contacting the power lines, which could cause cascading failure of the transmission lines and towers and could cause a sustained power outage at Hyatt PP. This would potentially inhibit the ability of Hyatt PP to move water which could lead to another emergency situation during high water events, like in 2017. In addition, it could cause two lines to contact each other causing a high current fault/flashover event becoming a safety risk if personnel and/or dry vegetation are in the area.

Due to the main spillway failure, PG&E also had to relocate one of their existing transmission lines as part of their emergency response to the main spillway failure. This resulted in PG&E installing: (1) a new temporary shoofly line (March 2017) along portions of the eastern edge of the new permanent alignment (i.e., east of structures P/Q5 through P/Q8); and (2) a permanent transmission line along portions of the western edge of the new permanent alignment (i.e., west of structures P/Q5 through P/Q8). The location of the new PG&E line immediately to the west of the reroute prevented the ability to shift the route location further west and away from the nest.

In coordination with the USFWS, DWR secured an Eagle Nest Take permit (No. MB53028C-0) to remove the primary nest and fell the nest tree. DWR is required to

make a reasonable attempt to relocate the primary nest to a new suitable tree within the eagle pair's territory.

As explained in Section 7.7.8, DWR must comply with the NERC regulations and therefore removal of the eagle nest tree was a necessity for safety and liability reasons.

The eagle nest was removed, intact, on Friday September 15, 2017. A bulk of the material from the secondary nest was placed in the bed of a pick-up truck. Both the primary nest and secondary nest materials were transported to the Oroville Field Division offices at the Hyatt Powerplant for storage until a decision could be made on next steps. The tree was felled later that day removing the potential safety concerns prior to the powerlines being energized on or about September 22, 2017.

In coordination with the USFWS and CDFW, on November 28, DWR and its various contractors installed two of four surrogate nest structures within nest trees that were assessed for access, property ownership, current and potential future constraints, tree health, and canopy location. Two additional nest structures were installed in surrogate trees on December 14 and 15, 2017. A fifth tree was trimmed to attract potential eagle nesting as well.

On December 26, 2017, DWR in coordination with the DPR received an Eagle Nest Exhibition Permit (Permit Number: MB70367C-0) to display the intact eagle nest at the Lake Oroville Visitor Center, providing an opportunity for public outreach and education on bald eagles and the Oroville Emergency Response and Recovery actions. On or about January 17, 2018, the Glen Pond nesting pair relocated to the north side of the TDP, in the same general vicinity as their old territory.

7.10.2.2.2 Valley Elderberry Longhorn Beetle

The current range of the VELB extends throughout the Central Valley from approximately Shasta County in the north to Fresno County in the south including the valley floor and lower foothills. Most VELB have been documented below 500 feet in elevation, however, areas above 500 feet with suitable habitat and known VELB occurrences in the area may contain VELB populations. (USFWS 2017)

The beetle primarily inhabits riparian habitat and adjacent uplands and depends on its host plant the valley elderberry throughout its life cycle. Valley elderberry longhorn beetles, which spend most of their 2-year life cycle boring within the stem in a larval stage, emerge from March through June as adults to lay eggs, completing the life cycle (Barr, 1991). DWR mapped and surveyed elderberry bushes using the FWS protocol within 100 feet of all project features within the project boundary, including roads, levees, campgrounds, and trails. No protocol level surveys were conducted within the portion of the OWA bordering the Feather River and downstream of the Feather River.

In these areas, elderberry shrubs were mapped, and VELB presence was assumed based on prior sampling (DWR, 2004b).

Elderberry bushes are one of the most common shrub species in high terrace habitats within the portion of the OWA bordering the Feather River. More than 90 acres of elderberry shrubs have been mapped on project levees in this area. Elderberry shrubs are rare along the shores of Lake Oroville, Thermalito Forebay, and Thermalito Afterbay. Several small patches of elderberry shrubs are present within the FERC study area between Oroville Dam and Table Mountain Boulevard. (Federal Energy Regulatory Commission, 2006)

Environmental Effects to Valley Elderberry Longhorn Beetle

During the relicensing surveys, approximately 95 acres of valley elderberry were delineated within the project boundary, with 0.402 acre around Lake Oroville, 2.255 acres in the area downstream from the Oroville dam and north of Highway 162, and 91.831 acres in the OWA south of Highway 162 and Larkin Road. Forty-five elderberry stems greater than 1 inch in diameter (preferred size of the valley elderberry longhorn beetle) were mapped along the Feather River corridor between Oroville Dam and the Fish Barrier Pool and along the Thermalito Power Canal, elderberry shrubs with stems greater than 5 inches in diameter in high density were located along the levees within the portion of the OWA bordering the Feather River.

During the initial emergency response activities (February 2017), elderberry shrubs were identified within or near work areas, 25 ft. buffer zones were flagged and construction crews were instructed to avoid the plants as much as possible. In mid-March, it was determined that an elderberry shrub in the active construction area on the hillside left of the FCO Spillway would need to be removed. DWR contacted the USFWS. Following that discussion, the plant was surveyed for number of stems and presence or absence of exit holes. The plant was removed on March 29, 2017 and transplanted to a suitable location near the Thermalito Afterbay. In early April 2017, it was determined another shrub located on the hillside left of the FCO Spillway needed to be removed for emergency construction activities. On April 13, 2017, DWR notified the USFWS. Following this discussion, the plant was surveyed for exit holes and number of stem. This shrub was relocated to the Oroville Wildlife Area. Correspondence on April 18, 2017 with USFWS acknowledged the emergency nature of the transplant and that DWR would discuss additional requirements at a later date. Both plants are being monitored and as of September 2017, the plants had survived the hot summer and were doing well.

The removal of rock material from the OWA for use as pervious backfill at the FCO Spillway has the potential to impact additional elderberry shrubs. Boundaries were modified to avoid environmental impacts as much as feasible, however, habitat for

VELB occurs throughout the OWA. Due to the emergency nature of this activity, DWR consulted, informally, with the USFWS on October 18, 2017 via phone, with a follow-up email on October 20, 2017. After follow-up phone calls and emails, a project description and conservation measures were submitted to the USFWS for consideration. On November 8, 2017, the USFWS sent an email to DWR and FERC acknowledging that under the emergency consultation procedures, they were providing recommended Conservation Measures to avoid and minimize effects to listed species and habitat and that DWR would provide a summary of the measures that were implemented in the forthcoming request for formal consultation.

On October 23, 2017, the USFWS provided DWR with some general and species-specific conservation measures. A copy of the USFWS Conservation Measures and DWR's Project Description document were included in the December 12, 2017 letter to FERC. The conservation measures are outlined below; however, DWR is unable to implement some USFWS recommended measures as written and has developed modifications. DWR's modification to specific measures are italicized below. These modifications have the same intention of reducing potential impacts to upland habitats that may be associated with the federally and State listed as threatened Giant Garter Snake (*Thamnophis gigas*) and the federally listed as threatened Valley Elderberry Longhorn beetle (*Desmocerus californicus dimorphus*) when project activities commence in December 2017

General Conservation Measures:

1. Prior to the start of construction activities, all construction personnel will participate in mandatory worker environmental awareness training.
2. Environmentally Sensitive Areas (ESAs) will be delineated with flagging or other Best Management Practices (BMPs).
3. DWR and the construction contractor will implement general wildlife protection measures during construction that will include, but may not be limited to:
 - a. Limit construction activities to daylight hours.
Construction may need to occur at night to complete the FCO Spillway Chute walls in a timely fashion.
 - b. Confine clearing to the minimal area necessary.
 - c. Clearly delineate the boundary of the project footprint using fencing, flagging, or other means.
 - d. Avoid wildlife entrapment by completely covering, or providing escape ramps for all excavated steep-walled holes or trenches.
 - e. Inspect the work area and any equipment left on sight overnight for federally-listed species prior to the start of construction activities each day.
 - f. Observe posted speed limit signs on local roads and observe 15-mile-per

hour speed limit.

A 25-mile per hour speed limit is needed because of the distance from the FCO Spillway Chute site, the proposed amount of truck trips (~5,500), and the need to complete the activities in a timely manner. A boundary modification has been put in place to avoid impacts to upland GGS habitat.

- g. Dispose of garbage in wildlife-proof containers and remove from the construction site regularly.
 - h. Retain a qualified biological monitor to be present or on call during construction activities with potential to affect federally-listed species.
DWR will use an experienced biological monitor that is familiar with GGS and VELB, but may not have the handling experience that is often required of a 'qualified biological monitor'. The boundary modification for OWA-2 avoids upland GGS habitat for OWA-2. OWA-1 does not have GGS habitat nearby. DWR does have a qualified biological monitor that will be available via phone for any questions that a site monitor may have.
4. DWR or the construction contractor will develop and implement spill prevention, control, and countermeasure plan (SPCCP) to minimize the potential for, and effects from spills of hazardous, toxic, and petroleum substances.
The construction contractor will develop and implement an environmental protection plan (EPP) (as opposed to a spill prevention, control, and countermeasure plan (SPCCP)) which is utilized for the same purpose - to minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and operation activities, as well as equipment available to minimize the effects of unearthing previously undocumented hazardous materials. Implementation of this measure will comply with State and Federal water quality regulations. The EPP, in coordination with the stormwater pollution prevention plan (SWPPP), will describe spill sources and spill pathways in addition to the actions that will be taken in the event of a spill (e.g., an oil spill from engine refueling will be cleaned up immediately with oil absorbents) or the exposure of an undocumented hazard.
 5. The National Pollutant Discharge Elimination System Program (NPDES) requires projects that would result in ground disturbance of greater than 1 acre to obtain a general construction activity stormwater permit.
 - a. **Timing of construction.** All construction activities will occur from May 1 through October 1.
All construction activities will occur beginning as early as December 2017 and may extend into early to mid-2019 due to the urgency in completing the FCO Spillway Chute. The project will avoid impacts to upland GGS

habitat and will avoid the VELB flight season and thus the project timing should not contribute to additional impacts.

- b. **Stabilize grading spoils.** Grading spoils generated during construction may be temporarily stockpiled in staging area.
The site will be stabilized per recommendations of the Qualified SWPPP Developer (QSD) and/or the Qualified SWPPP Practitioner (QSP).
 - c. **Permanent site stabilization.** The construction contractor will install structural or vegetative methods to permanently stabilize all graded or disturbed areas once construction is complete.
The site is characterized by unnatural mine tailings with very rare flooding events. The Project QSD will determine a need for site stabilization with vegetative methods.
 - d. **Staging of construction equipment and materials.** Equipment and materials will be staged in designated staging areas.
 - e. **Minimize soil and vegetation disturbance.** The construction contractor will minimize ground disturbance and disturbance of existing vegetation.
 - f. **Install sediment barriers.** The construction contractor will install silt fences, fiber rolls, or similar devices to prevent soil-laden water from leaving the area.
The construction contractor will install silt fences, fiber rolls, or similar devices to prevent sediment-laden water from leaving the construction area, as determined by the project's QSD.
6. If project activities must occur during non-daylight hours, a qualified biologist will establish monitoring measures.
 7. Dirt access and haul roads and spoils areas within the action area will be watered
at least twice each day when being used during dry periods during construction.
Dirt access and hauls roads and active construction areas within the project area will be kept sufficiently watered to minimize dust (as opposed to twice each day).
 8. After completion of construction activities, the construction contractor will remove any temporary fill and construction debris.
Temporarily disturbed upland areas will be reseeded with a Service-approved native seed mix and channel vegetation will be allowed to recolonize, as per the discretion of the Project QSD.

The following measures will be implemented to avoid, minimize and/or mitigate (as opposed to just 'mitigate') for potential impacts to valley elderberry longhorn beetle (the following is taken from the Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle and does not necessarily reflect the recommendations as provided in the USFWS Conservation Measures):

- a) *Timing: As much as feasible, all activities that would occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB, which is considered March - July. All work will implement dust abatement measures within 20 ft. from the drip-line*
- b) *Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity. All work outside of the flight season will implement dust abatement measures within 20 feet from the drip-line. All work during the flight season will implement dust abatement measures within 100 feet of elderberry shrubs;*
- c) *All elderberry shrubs within 20 feet of the project footprint will have a 20-foot buffer delineated with high visibility materials, beginning at the drip-line. All construction activity will avoid these buffers and associated elderberry shrubs.*
- d) *A Translocation Plan will be submitted and approved by the USFWS prior to the removal and transplanting of shrubs. Four (4) to six (6) elderberry shrubs within the project footprint will be transplanted to a USFWS approved location following the USFWS-approved Transplanting Plan. The plan will include a revegetation component following the Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (USFWS 2017 https://www.fws.gov/sacramento/documents/VELB_Framework.pdf)*

Where avoidance and minimization measures are infeasible, DWR, developed and is improving upon an Elderberry relocation plan (utilizing comments received from the USFWS on November 30, 2017) to move shrubs to an already identified mitigation site, just east of the OWA-Site 1 within the OWA. The plan includes planting additional elderberries and associated species utilizing the most recent USFWS 2017 Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle. The plants will be monitored for up to five years using the defined success criteria. If the success criteria are not met, additional plantings may be needed.

7.10.2.2.3 Giant Garter Snake

The Giant Garter Snake (GGS) is endemic to the wetlands of the central valley of California. Historical range is believed to include valley floor wetlands from the vicinity of Butte County south to near Bakersfield. Historically, giant garter snakes were found in natural wetlands associated with flood basins.

Thirteen sub-populations of giant garter snake have been identified. The northern extent of the current range of this species is described as Sacramento and Contra Costa counties (Fox, 1951), Gridley (Hansen and Brode, 1980), and to the vicinity of Chico (Rossman and Stewart, 1987). In addition to natural wetlands, giant garter

snakes are now found in agricultural wetlands (rice), managed wetlands (duck clubs and State and federal refuges), agricultural drains, ponds, and other artificial waterways.

The Draft Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*) (Miller and Hornaday, 1999) describes the essential habitat components for this aquatic reptile as follows: (1) adequate water during the snakes' active season (early spring through mid-fall) to support dense populations of prey; (2) the presence of emergent herbaceous cover (cattails and tules) for escape cover and foraging habitat; (3) grassy upland habitat adjacent to waterways for basking; and (4) higher elevation upland habitat for flood flow refuge. This species is absent from larger rivers, riparian woodlands, and wetlands with sand, rock, or gravel substrates (Miller and Hornaday, 1999).

Suitable GGS habitat was identified within portions of Thermalito Forebay, Thermalito Afterbay, the OWA, and lands subject to rice agriculture adjacent to the Thermalito Afterbay but outside the project boundary. About 4,280 acres of suitable habitat have been identified within the study area. DWR observed no giant garter snakes during the relicensing studies. DWR conducted habitat surveys in the areas of potential project affects near recreational developments and other project facilities, and non-protocol level field surveys were conducted during 2 weeks in August 2002 (DWR, 2004b). However, unconfirmed sightings of this species have been received historically from biologists working near Robinson Borrow Pond (adjacent to the project boundary), Cherokee Canal (2 miles west of Thermalito Afterbay), and within Thermalito Afterbay. No suitable habitat is present at Lake Oroville. Several small, isolated patches of backwater habitats along the Feather River within the project boundary provide suitable habitat. The rice fields and canals along the western border of Thermalito Afterbay have suitable habitat for giant garter snake. These canals are located primarily on private property and outside of the project boundary. Rice fields and agricultural ditches provide habitat for most of the existing populations of the giant garter snake (FWS, 1997), and these areas are expected to have populations of giant garter snake. Further, these canals offer dispersal channels for giant garter snake to eventually move into the OWA waters that have potentially suitable habitat. State Route 99 serves as a partial barrier to this dispersal habitat. (Federal Energy Regulatory Commission, 2006)

Environmental Effects to Giant Garter Snake

No habitat for GGS exists in the vicinity of Oroville Dam and the TDP; therefore, no impacts to GGS are expected from construction activities in this area.

The rock borrow activities proposed at the OWA may potentially impact upland habitat deemed suitable for GGS. Using buffers and best management practices, it is not anticipated that there will be impacts to GGS within the OWA. Informal consultation with the U.S. Fish and Wildlife Service (USFWS) was initiated on October 18, 2017 via phone with a follow-up email on October 20, 2017. After follow-up phone calls and

emails, a project description and conservation measures, were submitted to the USFWS for consideration. On November 8, 2017, the USFWS sent an email to DWR and FERC acknowledging that under the emergency consultation procedures, they were providing recommended Conservation Measures to avoid and minimize effects to listed species and habitat and that DWR would provide a summary of the measures that were implemented in the forthcoming request for formal consultation. On October 23, 2017, the USFWS provided DWR with some general and species-specific conservation measures. This project may start construction in early 2018. On November 1 and November 16, 2017, DWR provided the "Oroville Wildlife Area – Borrow Material Sites Project Sites" project description to the USFWS and CDFW, respectively. A copy of the USFWS Conservation Measures and DWR's Project Description document with additional conservation measures were included in the December 12, 2017 letter to FERC, and are also provided in the VELB discussion in Section 7.10.2.2.3, above. The GGS Species Specific Conservation Measures are as follows:

- The project will take place in early 2018 and extend, as needed. The project boundary is designed to avoid impacts to upland GGS habitat.
- A biologist will conduct pre-construction surveys in suitable giant garter snake habitat during the installation of all SWPPP BMPs, vegetation clearing within or adjacent to aquatic habitat, and the establishment of staging areas within 100 feet of aquatic habitat (during the active season) or 200 feet of aquatic habitat (during the inactive season). The project is designed to avoid impacts to upland GGS habitat.

Formal and consultation with the USFWS in this regard may be required following the OWA project activities.

7.10.2.2.4 Fish

Fish at Feather River Fish Hatchery

The FRFH saw some delayed development and mortality in fish, impaired water quality and sediment build-up, and increased maintenance and monitoring by CDFW hatchery crews. For example, the FRFH started with 9 million fall-run Chinook eggs with the goal of planting 7 million fish, but only 5.5 million fall-run were planted. There was a total of 3 million spring-run eggs with a goal of 2 million fish, but only 1.69 million spring-run were planted.

Mitigation Measures:

- Transfer fish to Thermalito Annex – Because the Annex relies on groundwater wells to furnish its water and there were no known problems with water quality at that location, approximately two million spring-run Chinook salmon and 4.2

million fall-run Chinook salmon were transferred to the Thermalito Annex on February 9-11., 2017

- Provide cleaner water at FRFH - To mitigate for the high turbidity and provide cleaner water to the remainder of the fish, a sedimentation area was created with the help of CDFW engineers and a private contractor. This was done by using the rearing channel (20 wide' x 10' deep x 2,850' long). The channel has a series of head boxes that hold water for the first 600'. At the 600-foot section, a pump was set, powered by a generator, to provide cleaner water to the head box where the remainder of the fish were located. This was used until the turbidity in the water coming out of the sedimentation area was the same as the water coming into the hatchery.
- Reduce turbidity coming in to hatchery building - After many years of low numbers of Steelhead, in early 2017 the hatchery received a high number of adult Steelhead, resulting in about 1 million eggs. The eggs were in various stages of development making it difficult to move. The water to the facility comes from an intake close to the TDD, and because the turbidity coming into the hatchery from the intake reached 850 NTU's at one point, there was concern the eggs might suffocate if left untreated. With the help of CDFW Engineers, FRFH personnel, DWR personnel, private contractors, Cal-Fire, Central Valley Regional Water Quality Control Board (CVRWQCB) staff, and NMFS staff, a plan was developed to use water from an adjacent fire hydrant with a charcoal filter to remove the chlorine from the water. A set of manifolds were constructed to provide water to each incubator stack. Because domestic water is warmer and has low oxygen, a second set of manifolds was built to combine raw water to the stacks to decrease the temperature and provide more oxygen. To make sure there was enough oxygen in the water, a column filled with plastic rings was built to break the water as it enters the incubators, increasing the oxygen to the eggs.
- Relocation of equipment to higher ground – in the event of higher waters, crews moved equipment to the upper parking lot
- Maintain water quality levels – Crews continued to monitor water quality and adjusted as necessary.

Ensure health of remaining fish – Fish were provided with medicated and probiotic feed to improve health. Salt was also added for disease prevention. The following federally listed fish species are currently being evaluated for potential impacts that may have occurred as a result of the emergency incident.

Central Valley Spring-run Chinook Salmon

Central Valley (CV) spring-run Chinook salmon were originally listed as threatened on September 16, 1999 (64 FR 50394). This Evolutionarily Significant Unit (ESU) consists of naturally spawned spring-run Chinook salmon originating from the Sacramento River

basin. The FRFH spring-run Chinook salmon population has been included as part of the CV spring-run Chinook salmon ESU in the most recent CV spring-run Chinook salmon listing decision (70 CFR 37160, June 28, 2005). Although FRFH spring-run Chinook salmon production is included in the ESU, because all the FRFH spring-run Chinook salmon are adipose fin clipped, the take prohibitions in the regulation for threatened anadromous fish (50 CFR 223.203) promulgated under ESA section 4(d) do not apply to these fish. Critical habitat was designated for CV spring-run Chinook salmon on September 2, 2005 (70 FR 52488).

In the 2011 status review of the CV spring-run Chinook salmon ESU, the authors concluded that

The ESU status had likely deteriorated on balance since the 2005 status review and the Lindley et al. (2007) assessment, with two of the three extant independent populations (Deer and Mill creeks) of spring-run Chinook salmon slipping from low or moderate extinction risk to high extinction risk. Additionally, Butte Creek remained at low risk, although it was on the verge of moving towards high risk, due to the rate of population decline. In contrast, spring-run Chinook salmon in Battle and Clear creeks had increased in abundance since 1998, reaching levels of abundance that place these populations at moderate extinction risk. Both of these populations have likely increased at least in part due to extensive habitat restoration. The Southwest Fisheries Science Center concluded in their viability report (Williams et al. 2011) that the status of CV spring-run Chinook salmon ESU has probably deteriorated since the 2005 status review and that its extinction risk has increased. The degradation in status of the three formerly low- or moderate-risk independent populations is cause for concern.

In the 2016 status review of the CV spring-run Chinook salmon ESU, the authors concluded

... with a few exceptions, CV spring-run Chinook salmon populations have increased through 2014 returns since the last status review (2010/2011), which has moved the Mill and Deer creek populations from the high extinction risk category, to moderate, and Butte Creek has remained in the low risk of extinction category. Additionally, the Battle Creek and Clear Creek populations have continued to show stable or increasing numbers the last five years, putting them at moderate risk of extinction based on abundance. Overall, the [Southwest Fisheries Science Center] concluded in their viability report that the status of CV spring-run Chinook salmon (through 2014) has probably improved since the 2010/2011 status review and that the ESU's extinction risk may have decreased, however the ESU is still facing significant extinction risk, and that risk is likely to

*increase over at least the next few years as the full effects of the recent drought are realized (Williams et al. 2016). The 2015 adult CV spring-run Chinook salmon returns were very low. Those that did return experienced high pre-spawn mortality. Juvenile survival during the 2012 to 2015 drought has likely been impacted, and will be fully realized over the next several years.*⁴

The Central Valley spring-run Chinook salmon ESU is now listed as endangered under the California Endangered Species Act. A final critical habitat designation was published on September 2, 2005, with an effective date of January 2, 2006. NMFS identified the Feather River downstream of Oroville Dam as critical habitat for Central Valley spring-run Chinook salmon. NMFS further ruled that it is premature to include areas upstream of Oroville Dam until ongoing recovery planning efforts in the Central Valley identify above-dam unoccupied areas that are essential for conservation of these ESUs (70 FR 52,630).

Chinook salmon are native to California rivers, including the Feather River. Chinook salmon have a varied life history. Within the Sacramento River System, three different ESUs of Chinook are recognized based on the time of year that upstream migrations begin. Spring-run Chinook salmon normally begin migration during March and continue through the beginning of September, holding in coldwater pools until ready to spawn. Fall-run Chinook salmon begin upstream migration in the summer and last until December. Although not located within the FERC project area, a small winter-run population of Chinook salmon also exists within the Sacramento River system, with upstream migration beginning in December (DWR, 2004f, 1982; 64 FR (179) 50,394–50,415; Moyle, 2002; Sommer et al., 2001).

Fall-run Chinook salmon, considered ocean-type, enter the Feather River in late summer and fall and typically spawn shortly after arriving on the spawning grounds in late September through December (Sommer et al., 2001; Yoshiyama et al., 1998). Water temperature strongly influences the timing of adult Chinook salmon spawning activity. When daily average water temperatures decrease to about 60°F, female Chinook salmon begin to construct nests (redds) into which their eggs (simultaneously fertilized by the male) are eventually released. Fertilized eggs are subsequently buried with streambed gravel. Spawning activity in the Feather River occurs from late August through December and generally peaks in mid to late November (Myers et al., 1998).

Most juvenile Chinook salmon emigrate from the Feather River within a few days of emergence, and 95 percent of the juvenile Chinook have typically emigrated from the Oroville Facilities project area by the end of May. Chinook exhibiting the typical spring-

⁴NMFS, Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response and Fish and Wildlife Coordination Act Recommendations for Relicensing the Oroville Facilities Hydroelectric project, Butte County California (FERC project No. 2100-134), December 5, 2016.

run life history are found holding at the Thermalito Afterbay outlet and the fish barrier dam as early as April. Water temperatures reported to be optimal for rearing of Chinook salmon fry and juveniles are between 45 and 65°F (NMFS, 2002; Rich, 1987; Seymour, 1956). Juvenile fall-run Chinook salmon normally rear for 1 to 7 months in freshwater before migrating to the ocean (Yoshiyama et al., 1998), and normally spend 4 to 5 years in the ocean (Moyle, 2002). Juvenile Chinook salmon in the Feather River have been reported to emigrate from about mid-November through June, with peak emigration occurring from January through March (DWR, 2002c; Painter et al., 1977). (Federal Energy Regulatory Commission, 2006)

Central Valley Steelhead

Steelhead are native to California rivers. On March 19, 1998, NMFS listed the naturally spawned Central Valley steelhead as threatened under the ESA (63 FR 13,347). In June 2005, NMFS determined that hatchery stocks are to be included in a steelhead Distinct Population Segment if they are no more than moderately diverged from local, native populations in the watershed(s) in which they are released.

In their final listing determination published January 6, 2006 (71 CFR 834), NMFS concluded that the threatened Central Valley Steelhead Distinct Population Segment includes all naturally spawned populations of steelhead (and their progeny) below natural and manmade barriers in the Sacramento and San Joaquin rivers and their tributaries. The listing excludes steelhead from San Francisco and San Pablo bays and their tributaries, and includes steelhead from the FRFH.

Critical habitat for Central Valley steelhead was designated by NMFS in September 2005 (70 FR 52,488), and includes the Feather River downstream of Oroville Dam.

Most of the natural steelhead spawning in the Feather River occurs in the low flow channel, particularly in its upper reaches near Hatchery Ditch, a side-channel located between RM 66 and 67. Limited steelhead spawning also occurs below the Thermalito Afterbay Outlet. Soon after emerging from gravel, a moderate percentage of the fry appear to emigrate. The remainder of the population rears in the river for at least 6 months to 1 year. Studies have confirmed that juvenile rearing and probably adult spawning are associated with secondary channels within the low flow channel (DWR, 2005a). The lower velocities, smaller substrate size, and greater amount of cover (compared to the main river channel) likely make these side-channels more suitable for juvenile steelhead rearing.

Currently, this type of habitat comprises less than 1 percent of the available habitat in the low flow channel (DWR, 2001b). Juvenile steelhead in the Feather River emigrate from about February through September, with peak emigration occurring from March through mid-April. However, empirical and observational data suggest that juvenile

steelhead potentially emigrate during all months of the year in the Feather River. (Federal Energy Regulatory Commission, 2006)

Green Sturgeon

Green sturgeon (*Acipenser medirostris*) are a species of ancient fish highly adapted to benthic environments, and very marine oriented. They enter freshwater mainly to spawn, but reside in bays, estuaries, and near coastal marine environments for the vast majority of their lifespan. They are known to be long-lived. Green sturgeon captured in Oregon have been age-estimated up to 52 years old, using a fin-spine analysis (Farr and Kern 2005). They are iteroparous, meaning they can spawn multiple times within their lifespan.

Green sturgeon are divided into two distinct population segments (DPSs): a northern DPS (nDPS) and a southern DPS (sDPS) (Figure 2-19). While individuals from the two DPSs are visually indistinguishable and have significant geographical overlap, current information indicates that they do not interbreed, nor do they utilize the spawning areas of each other's natal rivers. The sDPS of green sturgeon is the only one that is listed under the ESA, although the nDPS is a species of concern.

The sDPS green sturgeon includes those green sturgeon that spawn south of the Eel River, and these fish primarily spawn within the Sacramento River (Figure 2-20). Recent information indicates that sDPS green sturgeon will spawn in the Feather River (Figure 2-24) in some years (Seesholtz, A., Manuel, M., Van Eenennaam, J., 2014) and that spawning is also suspected in the Yuba River (National Marine Fisheries Service, 2015).

Environmental Effects to Special Status Fish Species

Background

Following the observation of the spillway failure on February 7 and activation of the Emergency Action Plan on February 8, 2017, DWR biologists contacted the National Marine Fisheries Service (NMFS) to discuss the emergency situation and the potential impacts downstream and to the FRFH. See Section 7.7.11 for a description of actions taken to address elevated levels of suspended sediment in the water flow into the FRFH. During the next couple of weeks, DWR, NMFS, and CDFW kept in communication and monitored the situation at the FRFH and developed contingency plans to release fish from the hatchery if conditions became unsuitable for rearing. As days turned into weeks, the conversation turned to monitoring the effects of potential stranding of salmonids and green sturgeon in the lower Feather River associated with emergency operations.

As described in Section 5.1, eroded debris from the spillways and adjacent hillsides were creating a blockage within the TDP and causing the water surface elevation in the TDP to rise which put Hyatt PP at risk of flooding. Beginning February 28, 2017, the FCO Spillway was shut down for periods of time to allow the eroded material to be removed from the TDP and the toe of the FCO Spillway. The length of each outage was based on a calculation of how long the inflow into the lake would take to raise the lake surface elevation to a pre-determined level. As the eroded material was removed and the water elevation of the TDP was reduced, DWR began releasing water through the turbines at Hyatt PP. The zero-flow outages reduced all flow from Lake Oroville however, water was released from the Thermalito Diversion Dam into the LFC to maintain a minimum flow of 600 cfs. Water was also discharged from the Thermalito Afterbay Outlet (TAO) so that flow entering the HFC never dropped below the minimum flow of 1,700 cfs during dredging operations.

On February 24, 2017, the NMFS sent a letter to FERC expressing concern regarding potential effects to CCV steelhead, sDPS Green Sturgeon, and spring-run Chinook Salmon from the proposed rapid reduction in flows from the FCO spillway of 60,000 cfs to zero. NMFS concerns included adverse impacts due to 1) a rapid reduction in flow which could result in stranding of fish in off-channel pools and 2) dredging within the TDP could result in increased sediment resulting in water quality concerns such as increased turbidity and effects to other parameters such as oxygen levels and pH affecting both fish within the Lower Feather River and the FRFH. NMFS provided a list of recommendations to minimize the effects on anadromous fish species, critical habitat, and EFH in the Feather River downstream of the Fish Barrier Dam during and after dredging operations. Although most of the recommendations from NMFS were followed, DWR was unable to implement some NMFS recommendations because of the intense nature of the dredging operations and the need for dredging to occur as quickly as possible. Measures were taken to provide minimum flows for in-river fish and to protect salmonids being housed at the FRFH, a large and challenging sampling effort was made to survey stranding pools, and fish rescues were performed. A Stranding Report was submitted to NMFS, FERC, CDFW, and FEMA on November 6, 2017 (DWR 2017). A summary of the NMFS recommendations and associated measures taken are listed below:

1. Reductions in flows should occur during hours of darkness on the Feather River to protect juvenile salmonids, especially Chinook Salmon.

Measures taken: During initial dredging activities, from February 27- March 17, decreases in release rates from Oroville Dam occurred mainly during daylight hours to provide for better monitoring of the FCO spillway, which was being visually monitored for damage on a continuous basis. Because the decreases in

release rates from Lake Oroville were so rapid there was no way to control the rate of decrease to the lower Feather River. Subsequent rapid reductions in releases to the FCO spillway also required visual inspection and therefore could not occur at night.

2. Reductions in flows (down ramping rate) should occur as slowly as possible, to allow fish to follow the receding water elevation.

Measures taken: On February 27, 2017, release rates from Oroville Dam FCO spillway were rapidly decreased to accommodate the required (emergency) assessments and continued to decrease until 0 cfs was released over the FCO spillway on February 28. There was concern that damage to FCO Spillway may be exacerbated during flow reductions below about 40,000 cfs due to the possibility of increased head cut erosion. Due to this concern flows could not be reduced as normal and rapid reductions ensued. On February 27 flow to the Feather River LFC was reduced from approximately 56,000 cfs to 600 cfs and in the HFC to approximately 2500 cfs (Figure 7.10-1). Three subsequent, although smaller reductions occurred during emergency operations through May. During the rapid reductions flows never went below minimums for either the low flow or high flow channel. Emergency down-ramping ceased in late May.

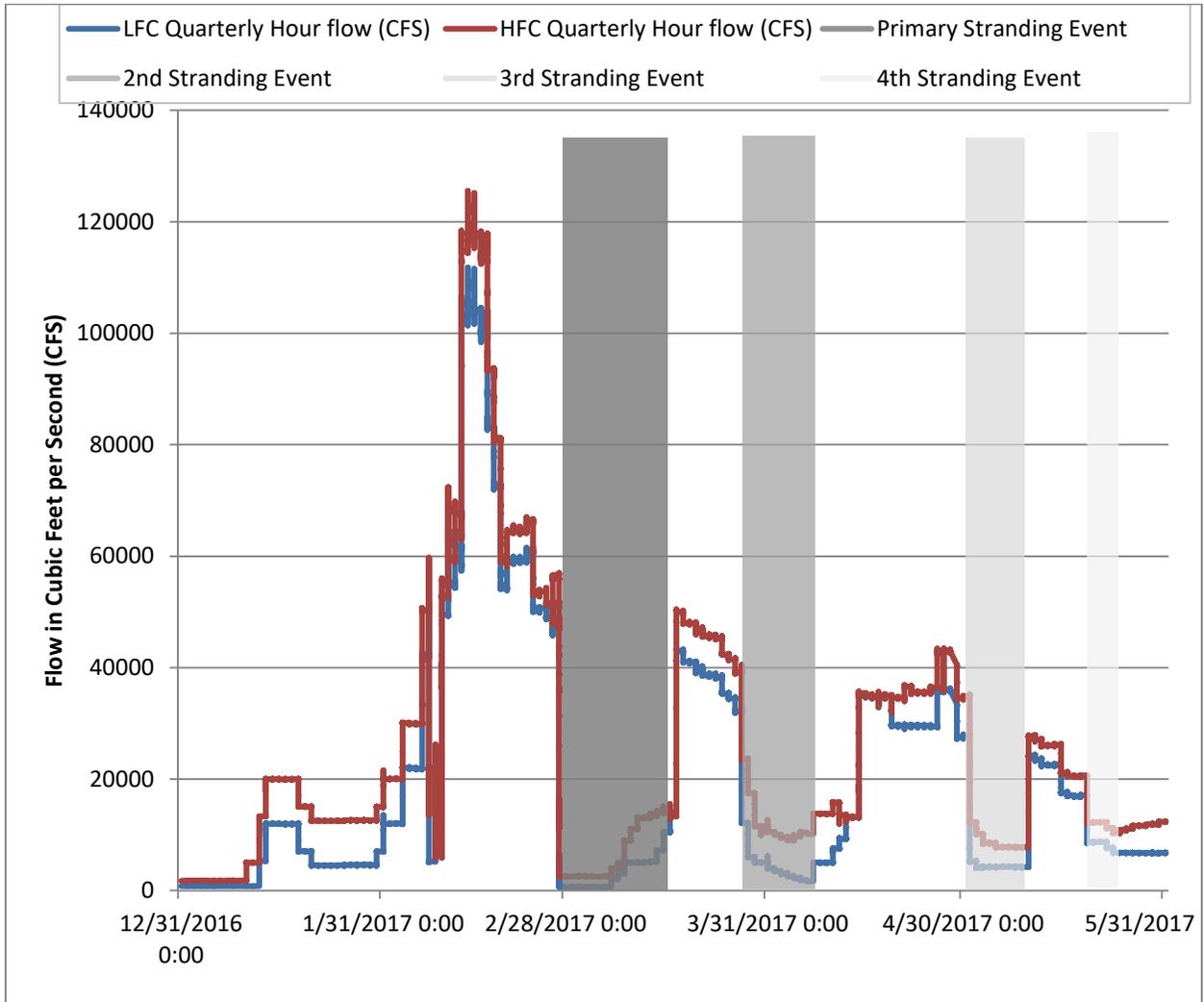


Figure 7.10-1. Changes in hourly flow levels (cubic feet per second: cfs) in the Low Flow Channel (LFC) and High Flow Channel (HFC) of the lower Feather River from base flows of 600 cfs for December through May, 2017. The primary flow reduction (Primary Stranding Event) occurred on February 27, 2017. Sampling weeks (stranding and fish rescue surveys) are shaded from lighter to darker gray for Week 1 (02/27/2017-03/03/2017), Week 2 (03/07/2017-03/09/2017), Week 3 (03/14/2017-03/15/2015) and Week 4 (05/22/17-05/25/17). Surveys occurred during Week 1 and Subsequent efforts continued during Weeks 2, 3, and 4. EDNA sampling also occurred during later reductions.

3. Minimum flows should be maintained at all times. Flows should not drop below the minimum instream flows. If flows are expected to drop below the minimum instream flows, DWR should release water from the spillway to ensure minimum instream flows are met.

Measures taken: Water was released from the Thermalito Diversion Dam into the LFC to maintain a minimum flow of 600 cfs. Water was discharged from the

Thermalito Afterbay Outlet (TAO) so that flow entering the HFC never dropped below the minimum flow of 1,700 cfs (Figure 7.10-1).

4. Consider initially dredging a channel through the debris that will allow water to flow to maintain minimum flows or more. Provide flow through the river valves and/or the powerhouse. Repairs at the powerhouse and river valves should be prioritized to provide water to the Feather River immediately.

Measures taken: Water was released from the Thermalito Diversion Dam into the LFC to maintain minimum flow of 600 cfs. Water was discharged from the TAO so that flow entering the HFC never dropped below the minimum flow of 1,700 cfs during dredging operations. Dredging operations were accelerated to remove material deposited in the Thermalito Diversion Pool. Removing this material allowed Hyatt PP to come back on-line so water could continue to be released from Lake Oroville and continue down the Feather River when lake levels dropped below the FCO spillway.

5. Address water supply issues (quantity and quality) at the FRFH and Thermalito Annex. Ensure adequate water is available to these facilities and that the turbidity, oxygen, and pH stay below levels that will stress fish.

Measures: CDWR and CDFW closely monitored water parameters and supply issues. To ensure adequate water to fish, approximately 2 million spring-run Chinook Salmon and about 4.2 million fall-run Chinook Salmon were moved to the Thermalito Annex facility. A sedimentation channel and filtration system was set up for the fish and steelhead eggs that remained at the FRFH. More details can be found in Section 7.10.1.2.4.1.

6. Monitor/survey for stranding in the Feather River and implement fish rescues as possible.
 - i. Take pictures and video of locations and fish sampled. Check the date stamp on the cameras. With the video frequently verbally record the time, date, and location.
 - ii. In the case of survey, the numbers and species of fish should be estimated and recorded.
 - iii. In the case of fish rescues, the numbers and species of fish should be identified, and pictures taken. Where possible and it will not significantly impact the implementation of fish rescue, tissue samples and scales should be collected. The date, time, location, presence or absence of adipose fins, and who collected the sample recorded on

the bag. Number the bags and locations. Freeze large fish as soon as possible.

Measures taken: Aerial surveys were performed to determine the extent of stranding ponds and focus field staff efforts on areas of potential concern. An aerial survey was completed on February 26 prior to the decrease in release rate and another on February 27 when flow in the LFC dropped to 600 cfs to determine the stranding pools in the LFC created by the decrease in flow. Two additional flights were completed on February 28; one to inform on-ground surveys and another to gather high-resolution aerial orthorectified photographs (orthophotographs) of the stranding areas on the entire lower Feather River, consisting of 67 RMs. The upper 53 RMs of the high-resolution aerial orthophotographs were used to map and measure stranding pond areas using ArcView GIS v.10.4. Please see the Stranding Report (Appendix D) for detailed sampling protocols, observations, and results.

On-the ground stranding pool surveys and rescues began on February 27 starting at RM14 through RM66 due to the floodplain that developed above the confluence with Sutter Bypass below RM 14 and reconnected with the mainstem of the lower Feather River. Larger ponds in the remaining 14 mi were sampled using eDNA techniques to detect the presence of salmonids and sturgeon. Primary on-the-ground surveys ended on March 15 when flows had increased to 40,000 cfs and most of the pools had reconnected with the lower Feather River. Additional stranding and rescue surveys were performed after each significant down-ramping event (Figure 7.10-1). Sampling indicated that far fewer stranded fishes were found after each successive event due to inundation of most ponded areas between ramp-downs.

Tissues samples and otoliths (adult steelhead) were collected from many salmonid mortalities. Information on location, date, and basic species information was recorded. Samples were preserved by freezing or alcohol. Photographs were taken of some locations to further document observations.

7. Monitor water quality, turbidity, DO, pH, and adjust dredging operations if these parameters reach levels that may adversely affect fish at the fish barrier dam or in the hatchery.

Measures taken: See *Measures taken* to Recommendation #5 for monitoring at FRFH. Fish and eggs being held at FRFH did not seem to experience adverse impacts, however juvenile growth was slowed at the Thermalito Annex due to overcrowding (CDWR, unpublished 2017). Steelhead eggs performed well due to actions taken by DFW staff to ensure adequate water quality. Over 720,000

steelhead yearlings were reared at the FRFH in 2017-18, nearly double normal mitigation (400,000). Yearling steelhead were planted into the Thermalito Afterbay (120,000) in January 2018 to promote recreational opportunities for anglers. Another 50,000

When the Thermalito Diversion Pool was being dredged, average turbidity in the Diversion Pool 300 ft downstream from the dredging peaked at 639 NTU on March 2, 2017 (Figure 7.10-2). Turbidity and total suspended solids gradually declined over several days following the spillway incident after peaking at 639 NTU on March 2 and then remained at values approximately between 30 and 70 NTUs and 10 and 30 mg/L, respectively, for a month.

8. Water should be released from the Thermalito Afterbay to augment flows in the Feather River, while maintaining water deliveries to the Thermalito Annex.

Measures taken: Water was released from the TAO into the lower Feather River to meet flow requirements.

9. If possible, install turbidity curtains or booms to reduce potential turbidity levels, to the maximum extent possible.

Measures taken: This was not possible due to the large area being dredged with multiple vessels as well as the high flows and the short timeframe that was available. DWR measured turbidity throughout the dredging operations in the Diversion Pool (Figure 7.10-2).

10. Coordinate with the Corps, Yuba County Water Agency, PG&E and the Nevada County Irrigation District to augment flows from storage in the Yuba watershed. Also coordinate with South Sutter Water District regarding the availability of water from the Bear River for flow augmentation.

Measures taken: Minimum flows were maintained in the LFC and the HFC during dredging, therefore no flow augmentation was necessary. Flows to the lower Feather River were quite high throughout the winter and spring except when flows were reduced for spillway inspections (Figure 7.10-1).

11. Deploy as many people as possible to survey and respond to fish stranding, and coordinate with CDFW.

Measures taken: An exceptionally large workforce consisting of staff from CDWR, CDFW, and the Pacific State Marine Fisheries Commission (PSMFC) was deployed to sample stranding pools and perform fish rescues during the first week of sampling following flow reductions for dredging. During the second

week, a reduced team from the same agencies sampled larger pools that were previously inaccessible. DWR continued to sample and rescue fish (as possible) immediately after each subsequent flow reduction (Figure 7.10-1).

12. Submit a report of the activities and results to NMFS within 30 days.

Measures taken: Due to the extensive nature of the rescue and sampling effort and the long duration of the work (well past 30 days) DWR was not able to submit a full report of the results of the stranding effort until November. However, DWR did submit email updates to NMFS as data was available during the stranding surveys and weekly meetings were held to discuss all aspects of the spillway response including water quality and stranding efforts.

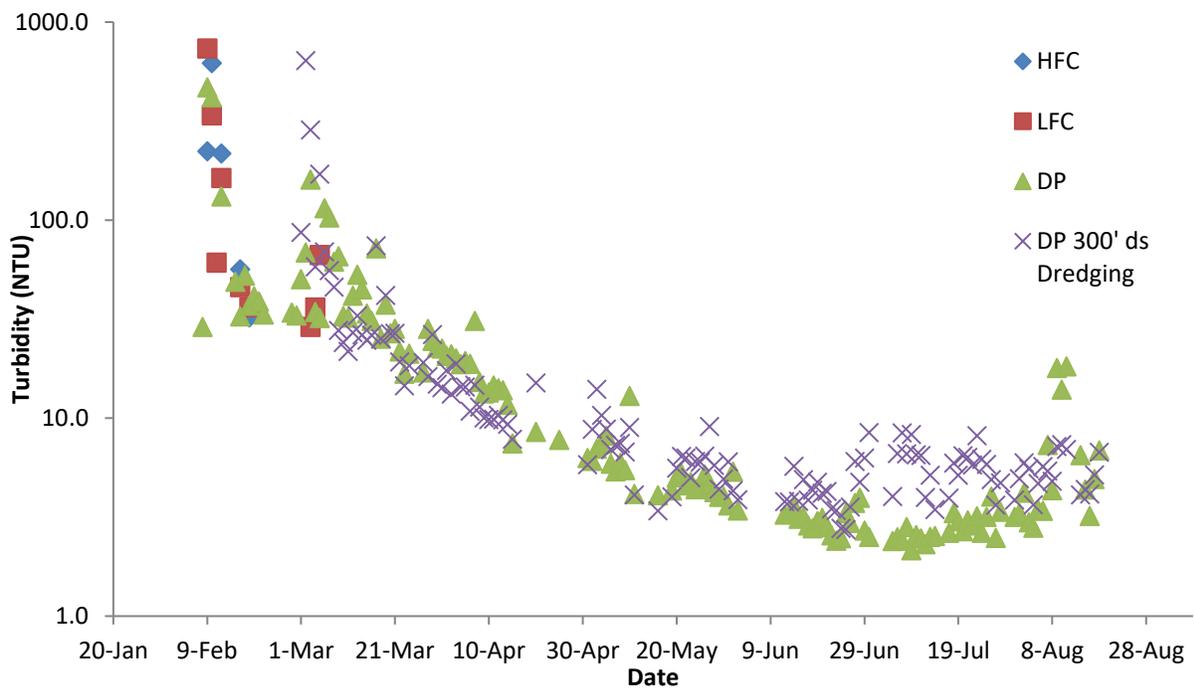


Figure 7.10-2. Turbidity (NTU) measured in the Feather River in the high flow channel (HFC), low flow channel (LFC), Diversion Pool (DP), and DP 300 ft downstream of the dredging in 2017. Note log scale on y-axis for turbidity.

Fisheries Environmental Effects Analysis

Emergency response activities that had potential to effect CV spring- and fall-run Chinook Salmon, CCV steelhead, and Northern American Green Sturgeon sDPS and their designated Critical Habitat include the emergency ramping of flows from the FCO Spillway into the Thermalito Diversion Pool and Lower Feather River resulting in rapid water level fluctuations and the release of additional sediment into the Lower Feather River from the use of the Emergency Spillway and the debris removal activities in the Diversion Pool. Potentially adverse effects to CV spring- and fall-run Chinook Salmon populations also include effects related to emergency operations at the FRFH.

Effects from Sediment

Description

It is estimated that approximately 2.2 million cy of eroded material washed into the TDP below the FCO and Emergency Spillways. As of November 1, 2017, a total of 2.0 million cy of debris have been removed from the TDP using heaving equipment such as excavators. The removal of debris in the Diversion Pool may have increased the turbidity by re-suspending sediment in the water column. Fish and other organisms in the Lower Feather River may have been exposed to increased turbidity and sedimentation as a result.

Turbidity measurements as high as 974 NTUs and total suspended solids as high as 753 mg/L were recorded at Auditorium Riffle in the Feather River LFC in the days following the incident (CDWR unpublished data; Figure 2). Turbidity and total suspended solids gradually declined over several days and turbidity was approaching 20 NTUs by mid-late March and holding between 10 and 20 NTUs by April 1. (CDWR unpublished data; Figure 2). Turbidity in the HFC peaked at 620 NTU on February 10, 2017 before decreasing over the next week.

High concentrations of suspended sediment can have both direct and indirect adverse effects on salmonids. The severity of these adverse effects depends on the sediment concentration, duration of exposure, life history timing, and sensitivity of the affected life stage. Increases in suspended sediment, sedimentation, and siltation above the background level related to the spillway incident could have potentially affected special-status fish and their habitat by (1) impeding adult holding and spawning, (2) reducing egg and alevin survival, (3) impairing juvenile survival and rearing behavior, and (4) reducing primary and secondary productivity. The increased turbidity and suspended sediment in the Lower Feather River downstream of the fish barrier dam had potentially adverse effects to CV spring- and fall-run Chinook Salmon, and CCV steelhead. The timing of turbidity and sedimentation impacts from the Oroville Spillway incident overlaps with the presence of rearing and emigrating juvenile CV spring- and fall-run

Chinook Salmon and CCV steelhead, upstream migrating adult CV spring-run Chinook Salmon, spawning CCV steelhead, and incubating CCV steelhead eggs. Specific potential impacts to each life stage are discussed in greater detail below.

Sediment effects on adult migration, holding, and spawning

Adult CV spring-run Chinook Salmon typically arrive at FRFH between late April and June (NMFS 2016). CV spring-run Chinook Salmon hold in large pools, mainly in the LFC upon arrival and through the summer before spawning in the fall (NMFS 2016). Adult CCV steelhead typically enter the Feather River from September to November and then hold until spawning (NMFS 2016). Adult CCV steelhead begin spawning in the Lower Feather River in late December, peak in late January and spawning is complete by the end of March (Cavallo et al. 2003, Hartwigsen and Reid 2009). Therefore, some upstream migrating and holding adult CV spring-run Chinook Salmon and holding and spawning adult CCV steelhead were exposed to elevated turbidity resulting from the Oroville Spillway incident.

Previous studies suggest that adult salmonids may be the life stage least impacted by elevated suspended sediment levels (Bash et al. 2001). Elevated turbidity does not appear to directly interfere with homing, although in extreme cases adult salmonids may stray from natal streams which have very high suspended sediment concentrations (Quinn and Fresh 1984). Elevated turbidity can, however, delay adult upstream migration and adult salmonids may seek out turbidity refugia (Bash et al. 2001). Several studies have documented active avoidance of turbid areas by adult salmonids (Bisson and Bilby 1982, Lloyd 1987, Servizi and Martens 1992, Sigler et al. 1984). Adult CV spring-run Chinook Salmon may have attempted to behaviorally avoid the elevated turbidity by seeking out less turbid locations. However, turbidity experienced in 2017 during adult migration of CV spring-run were approximately 10 NTU or less (April-June), similar to those experienced in 2006 and not a level that would cause significant delay or adult avoidance. Tributaries and areas of emerging subsurface flow may be used as turbidity refugia (Maslin et al. 1996, CFS unpublished data). However, there are few tributaries to the Lower Feather River. The main tributaries, the Yuba and Bear rivers, were turbid during this time as well. However, the Yuba River experienced extended turbidity into the spring, complicating the understanding of impacts from the spillway failure and the extreme rain and high flows experienced in 2017. Given the low probability of adult spring run Chinook Salmon presence during the peak of the incident when turbidities were elevated, any adverse impact would be minimal.

Sediment effect on eggs and alevin prior to emergence

CCV steelhead spawning in the lower Feather River primarily occurs from late December through March, egg incubation from approximately December through April,

and alevin emergence from approximately March through May (NMFS 2016). Therefore, elevated turbidity and fine sediment deposition from the Spillway Incident may have potentially impacted CCV steelhead egg to fry/larvae survival.

Elevated turbidity may have had adverse effects on CCV steelhead egg fertilization. A laboratory study determined that there is a negative relationship between suspended sediment concentration and egg fertilization in Sockeye (*O. nerka*) and Coho Salmon (*O. kisutch*, Galbraith et al. 2006) and this relationship likely is similar for other salmonids. Therefore, CCV steelhead spawning during elevated suspended sediment concentrations in the Lower Feather River may have had reduced egg fertilization. However, steelhead are naturally winter spawners in the Feather River and therefore likely evolved to spawn during highly turbid conditions. Furthermore, turbidity peaks didn't occur until February, a full month after steelhead typically start spawning in the Feather River.

Fine sediment introduced into the Lower Feather River deposited on spawning gravels may have reduced CCV steelhead egg to fry survival in 2017 and may impact both CCV steelhead and CV spring-run Chinook Salmon egg to fry survival in future years if the fine sediment was not transported out of the spawning gravels during the sustained high flows that occurred in the Feather River after the periods of high turbidity. Anadromous salmonids spawn in locations that have a low probability of scour during most flood events, but these areas are also more prone to sediment deposition (May et al. 2009). Observations of gravel movement in the Feather River after the 2017 high flows demonstrate that smaller and less compacted gravel was mobilized during the high flows, evidenced by the movement of most of the new spawning gravel DWR placed near the FRFH in 2014. Since salmonid spawning gravels were transported during high flows it is unlikely that fine sediment would then deposit in those same spawning areas given the forces need to mobilize much larger spawning gravel. Flows also continued to be high throughout the spring as turbidity significantly decreased, making it unlikely that fine material would be deposited into spawning gravels. The main mechanisms by which fine sediment impacts egg to fry survival are by reducing the supply of oxygenated water to the incubating eggs as a result of reduced gravel permeability (Greig et al. 2005, 2007, Yamada and Nakamura 2009) and the sediment oxygen consumption from interstitial sediments accumulated within salmonid redds (Sear et al. 2017).

Sediment effects on juvenile rearing

Feather River CV spring-run Chinook Salmon alevins emerge from the gravel in November and December (NMFS 2016). The majority of juvenile CV spring-run Chinook Salmon in the Lower Feather River emigrate as fry, with fry emigration peaking in December and then slowly declining from January to March (Bilski and Kindopp 2009).

A small number of CV spring-run Chinook Salmon remain in the Lower Feather River before emigrating in April and an even smaller number appear to emigrate in the winter as yearlings (Bilski and Kindopp 2009, DWR pers. comm). Recent research provides evidence that juvenile winter-run Chinook Salmon use the lowermost portions of the Feather River as non-natal rearing habitat (Phillis et al. 2018). The capture of juvenile CCV steelhead in Lower Feather River RSTs primarily occurs in March and April, with considerably lower catch in May and June (Bilski and Kindopp 2009). The majority of captured juvenile CCV steelhead were less than 150 mm FL, with very few larger smolt sized fish captured (Bilski and Kindopp 2009). Rearing juvenile CCV steelhead are present in the Lower Feather River year-round (Seesholtz et al. 2004). Therefore, elevated turbidity and suspended sediment resulting from the Spillway Incident may have adversely impacted rearing and migrating juvenile CV spring-run Chinook Salmon, winter-run Chinook Salmon, and CCV steelhead. However, sustained increased flows and the lengthy inundation of higher quality floodplain rearing habitat throughout the winter and spring was most likely a tremendous benefit for rearing and emigrating salmonids, providing food and cover not normally available, allowing an exceptional opportunity for growth and likely improved survival (Zabel and Williams 2002, Zabel and Achord 2004, Tomaro et al. 2012, Bond et al. 2008, Osterback et al. 2014).

Short-term increases in turbidity and suspended sediment may disrupt feeding activities or result in avoidance or displacement of fish from preferred habitat. Juvenile salmonids have been observed to avoid streams that are chronically turbid (Lloyd 1987) or move laterally or downstream to avoid turbidity plumes (Sigler et al. 1984). Bisson and Bilby (1982) reported that juvenile Coho Salmon avoid areas with turbidity exceeding 70 NTU. During periods of elevated turbidity in mainstem rivers, juvenile salmonids may find refuge in less turbid non-natal tributaries including intermittent streams (Maslin et al. 1996). Sigler et al. (1984) found that prolonged exposure to turbidities between 25 and 50 NTUs resulted in reduced growth and increased emigration rates of juvenile Coho Salmon and steelhead compared to controls. These findings are generally attributed to reductions in reactive distance, the ability of salmon to see and capture prey, in turbid water (Waters 1995). In laboratory studies, juvenile salmonids have been observed to transition from drift feeding to benthic feeding during periods of elevated turbidity (Gregory and Northcote 1993, Rowe et al. 2003). However, some field studies suggest that juvenile salmonids will continue to drift feed during turbid conditions despite the reduced reactive distance (Arndt et al. 2002, White and Harvey 2007). Chronic exposure to high turbidity and suspended sediment may also affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Waters 1995). Berg and Northcote (1985) observed changes in social and foraging behavior and increased gill flaring (an indicator of stress) in juvenile Coho Salmon at moderate turbidity (30-60 NTUs). In this study, behavior

returned to normal quickly after turbidity was reduced to lower levels (0-20 NTUs). Turbidity in the Lower Feather River appears to have remained at elevated levels for over two weeks (Figure 2), which may have reduced foraging success and growth for juvenile salmonids that remained in the Action Area, as has been observed in previous studies (Sigler et al. 1984). However, the elevated turbidity readings were taken high up in the system (the Diversion Pool and LFC) in the main river channel where suspended material would be highly mixed and greatest, whereas juvenile salmonids would be rearing along river margins and flooded habitats, far from the center of the river, where turbidities were much likely lower. Floodplain rearing generally provides opportunities for greater growth, and larger salmonid smolts tend to have better survival during emigration to the ocean and during their early marine life resulting in improved smolt to adult survival (Zabel and Williams 2002, Zabel and Achord 2004, Tomaro et al. 2012, Bond et al. 2008, Osterback et al. 2014).

Juvenile CV spring-run and winter-run Chinook Salmon that emigrated in response to elevated turbidity may have located high quality rearing areas on downstream floodplains inundated by high flows (Sommer et al. 2001, Katz et al. 2017). Juvenile CCV steelhead may also benefit from floodplain rearing opportunities, but this has not been studied. Juvenile salmonids forced to leave protective habitat due to elevated turbidity may have increased their exposure to predators. However, the increased predator exposure would likely be offset by greater cover provided by elevated turbidity and access to shallower floodplain habitats (Gregory and Levings 1998). Juvenile salmonids may also use turbidity as a cue for downstream migration, likely due to the cover from predators that it provides (Jensen et al. 2012). However, turbidity and flow are highly correlated in most river systems, so it is uncertain which factor provides the migration cue, but in 2017 both factors were likely operating.

Juvenile CV spring-run Chinook Salmon and CCV steelhead may have attempted to behaviorally avoid the elevated turbidity by seeking out less turbid locations; several studies have documented active avoidance of turbid areas by juvenile salmonids (Bisson and Bilby 1982, Lloyd 1987, Servizi and Martens 1992, Sigler et al. 1984). Tributaries and areas of emerging subsurface flow may be used as turbidity refugia (Maslin et al. 1996, CFS unpublished data). However, there are few tributaries to the Lower Feather River and the main tributaries, the Yuba and Bear rivers, were likely turbid during this time as well, but may have been less turbid than in the Lower Feather River. In alluvial rivers, water can move subsurface through gravel bars and then emerge on the downstream side as relatively clear water. Fish may actively seek out these locations to avoid elevated turbidity (CFS unpublished data). Alternatively, most juvenile CV spring-run Chinook Salmon, CCV steelhead, and non-natal rearing juvenile winter-run Chinook Salmon may have migrated downstream in response to elevated flows and turbidity.

Sediment effects on primary and secondary productivity

Fine sediment deposited into the benthos following a high turbidity event can adversely impact critical habitat and EFH, impairing growth and survival of juvenile salmonids (Suttle et al. 2004, Harvey et al. 2009). Accumulation of fine sediment can cause (1) a shift in benthic invertebrates from grazers to burrowers, which are unavailable as a food source for fish, and (2) increased activity as a result of lower prey abundance and reduced interstitial refuge (Suttle et al. 2004).

Deposited fine sediment can decrease production of the macroinvertebrate prey of juvenile salmonids (Wu 2000, Chapman 1988, Phillips et al. 1975, Suttle et al. 2004, Colas et al. 2013). Rivers with high fine sediment content tend to have low densities of macroinvertebrates and be taxon poor (Larsen et al. 2011, Buendia et al. 2013, Descloux et al. 2013). Low macroinvertebrate density from high fine sediment concentration leads to less available food for juvenile salmonids with potential impact on growth and survival (Suttle et al. 2004). Fine sediment resulting from the spillway incident which deposited in channel in the Lower Feather River could potentially reduce abundance of macroinvertebrates resulting in less food available for rearing Lower Feather River juvenile salmonids. There is no evidence that abnormal or adverse amounts of fine sediment deposited in areas where macroinvertebrates generally live. To the contrary, the movement of salmonid spawning gravel and sustained high flows supports the concept that fine sediment was unlikely to deposit in these areas and more likely to deposit in margins necessary for riparian vegetation recruitment.

Deposited fine sediment on floodplains may have beneficial impacts by providing substrate for riparian vegetation to grow (Harper et al. 2011). Riparian vegetation provides shade, cover, LWD, nutrients in the form of leaf litter, terrestrial food inputs, and velocity refugia during high flows, all of which benefit special-status fish species (Allan et al. 2003, Boone et al. 1997, Collins and Montgomery 2002, Lawrence et al. 2014, Inoue and Nakano 1998, Johansen et al. 2005, Collins et al. 2012, Crook and Robertson 1999).

Conclusion of Effects from Sediment

The turbidity and suspended sediment introduced into the Lower Feather River as a result of the Oroville Spillway incident had potentially adverse effects on CV spring-run Chinook Salmon, CCV steelhead, and their critical habitat. The Spillway Incident had potentially adverse effects on juvenile winter-run Chinook Salmon using the lower Feather River for non-natal rearing. It also had potentially adverse effects on Chinook Salmon EFH. Juvenile CV spring-run Chinook Salmon, winter-run Chinook Salmon, and CCV steelhead that remained in the Lower Feather River to rear during the elevated turbidity may have experienced reduced growth as a result of impaired reactive distance

and impacts to their macroinvertebrate food source from fine sediment deposited in channel. Fine sediment accumulation in spawning gravels may also have reduced egg to fry survival of CCV steelhead in the 2017 cohort and may impact both CCV steelhead and CV spring-run Chinook Salmon egg to fry survival in future years. Fine sediment accumulation negatively impacts the quality of salmonid spawning and rearing habitat which are critical habitat PBFs and two of the four major components of EFH; spawning habitat in particular is an EFH HAPC.

Although turbidity and suspended solids were high during and immediately following the incident, sustained flow pulses >40,000 cfs in spring of 2017 may have flushed sediment deposited during the incident and reduced or eliminated future impacts on spawning habitat and macroinvertebrate production. Furthermore, 2006 turbidity data demonstrates that increased turbidity is normal under higher flow events (Figure 7.10-3), although short-term turbidity experienced in 2017 was unusually high. Elevated turbidity may have had positive effects by providing increased cover during juvenile salmonid emigration as well as by providing substrate for riparian vegetation recruitment.

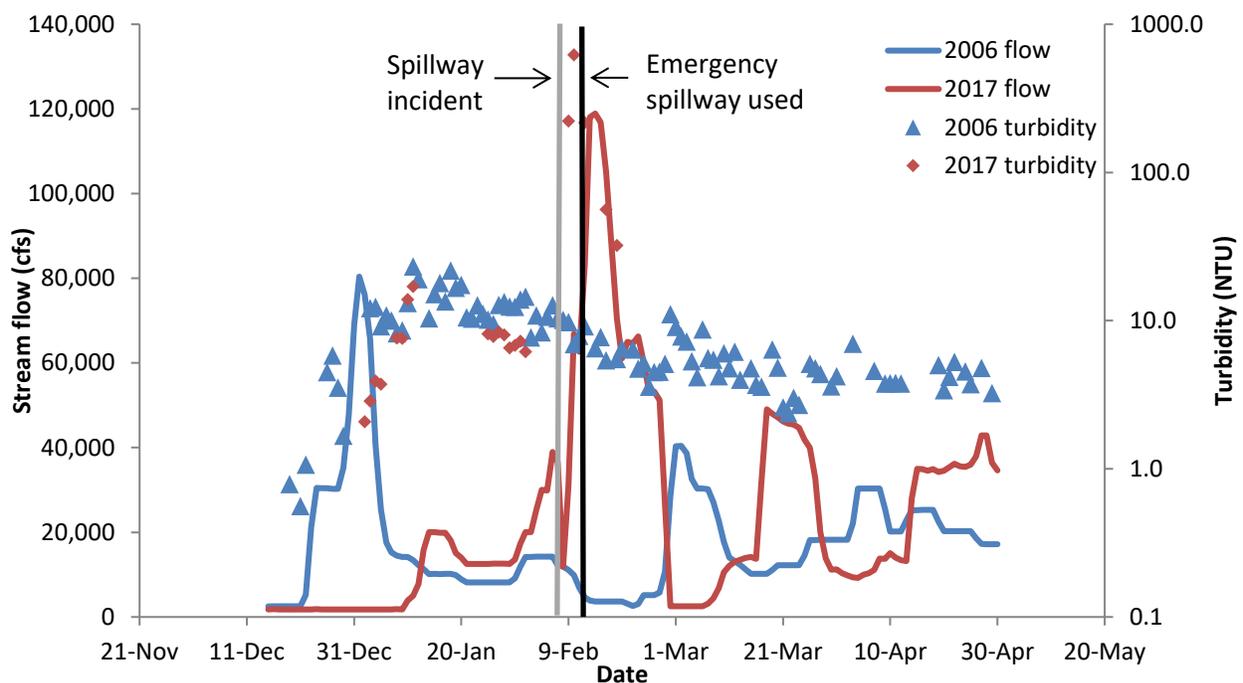


Figure 7.10-3. Streamflow (cfs) and available turbidity (NTU) data for the high flow channel in 2006 and 2017. Note log scale on secondary y-axis for turbidity.

Down-Ramping Effects

Description

During the spillway incident, down-ramping rates were unusually fast on four separate occasions: 2/27, 3/27, 5/1, and 5/18 (Figure 4). These periods are when flow effects related to the spillway incident may have affected special status species.

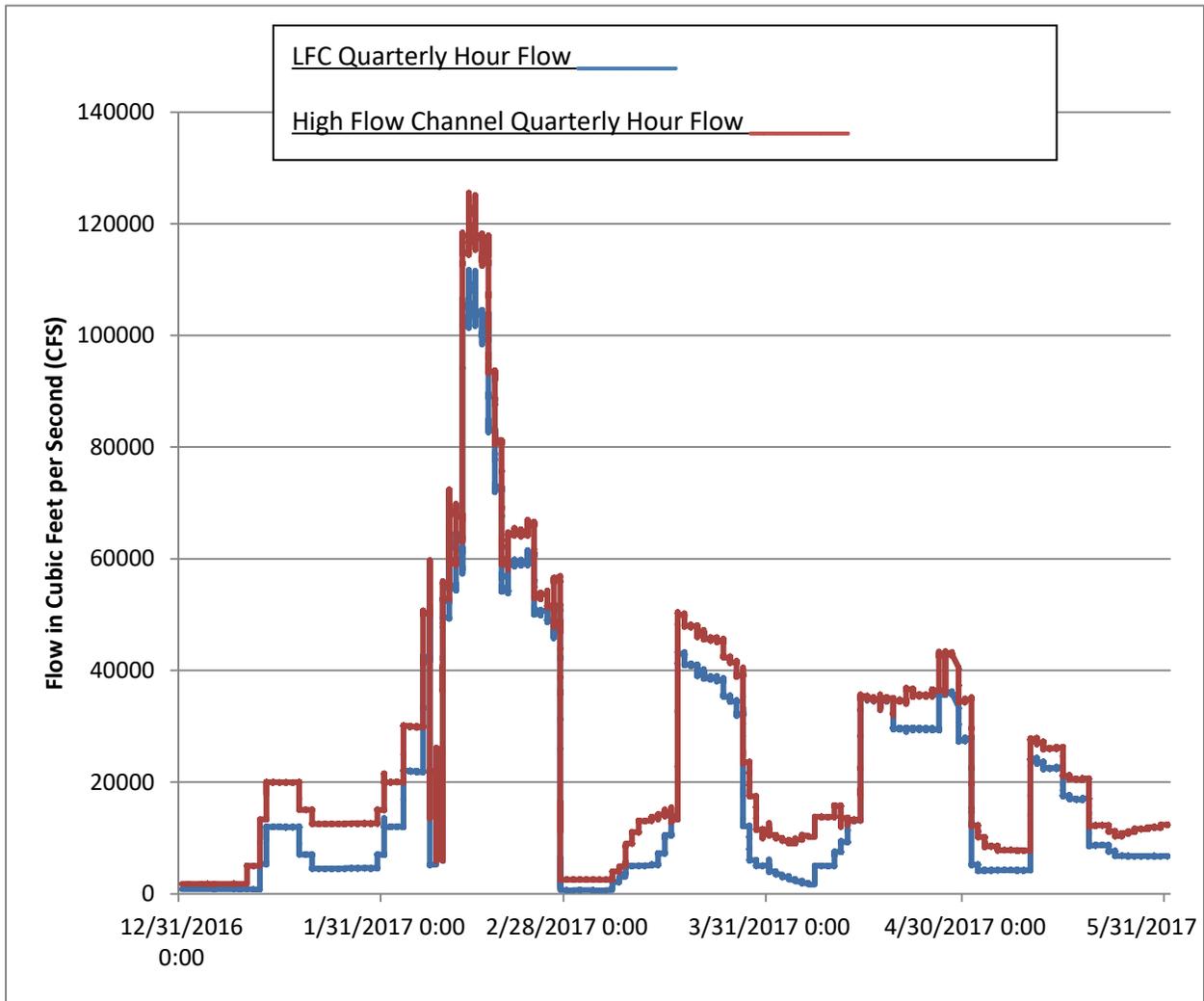


Figure 7.10-4. Graph depicting instances when down-ramping rates were unusually fast.

Stranding effects

Stranding that occurred after the Spillway incident was extensively surveyed, documented, and evaluated by the CDWR Division of Environmental Sciences (DWR 2017). Estimated total stranding is described for each target species below, and summarized in Table 7.10-1. The range of values reported for each target species originates from identifying the lowest and highest estimates reported of stranded individuals across the total sampled area (Tables 6 and 16 of the DWR Stranding report – Appendix D). The overall conclusion of the stranding report was that while the spatial and temporal extent of stranding was considerable, overall mortality from stranding was relatively low for species of concern. Additionally, the benefits conveyed to juvenile salmonid species via access to floodplain resources in the sustained high-flow conditions were likely substantial. However, we do not know the extent or impact of stranding in unobserved, rapidly-desiccated pools.

Table 7.10-1. Observed and extrapolated numbers of special status species stranded in wet pools during the Oroville Dam Spillway incident. Subsequent high flows reconnected wet pools with the main channel.

Life Stage	Target Species	Observed stranded	Extrapolated range stranded
Juvenile	fall-run Chinook Salmon	3938	267894 - 346469
Juvenile	late fall-run Chinook Salmon	13	260 - 884
Juvenile	spring-run Chinook Salmon	71	4817 - 5380
Juvenile	winter-run Chinook Salmon	2	NA - 0
Adult	Chinook Salmon	2	136 - 136
Yearling	hatchery CCV steelhead	19	1289 - 1631
Adult	hatchery CCV steelhead	4	58 - 268
Fry	wild CCV steelhead	1	70 - 87
Yearling	wild CCV steelhead	20	575 - 1355
Adult	wild CCV steelhead	10	145 – 676
Juvenile	Green Sturgeon	0	NA
Adult	Green Sturgeon	0	NA

All evaluated stranding was classified as having occurred in “wet pools” (i.e. ponds that retained water for the duration of the sampling) or in “dry pools” (depressions which desiccated soon after the high flow event occurred and were dry at the time of physical sampling). All extrapolated numbers of stranded fish are estimated from taxa-specific sampling densities in wet pools only, as the total area (m²) of dry pools in the affected area was not possible to calculate. The observed stranding of target species is

depicted in Table 7.10-1. Mortality in dry pools was 100%, while mortality in wet pools ranged from 2.2- to 5.6% for salmonid species. No sturgeon were sampled or detected in any pools sampled, wet or dry. Stranding overall was higher in the high-flow channel than in the low-flow channel, although individual species' stranding distributions differed.

California Central Valley Steelhead

The timing of the first significant ramp-down coincided with the steelhead spawning window (January – February). Fifty-four total CV steelhead, comprising both hatchery and natural origin and of all life stages, were found stranded. Adult steelhead were concentrated in the low-flow channel, while the majority of the 20 yearlings were found in the high-flow channel. A single fry-size steelhead was sampled in the high-flow channel, indicating that successful spawning did occur in 2017.

Steelhead spawning in the Feather River generally begins in December, peaks in January and trails off in the spring (Kindopp and Kurth 2003). It is likely that a large proportion of the 2017 steelhead redds had been constructed and embryos were incubating during the time of the spillway incident or spawning was aborted due to high flows. The majority of steelhead spawning occurs in the LFC and flows in this reach averaged ~ 32,000 cfs on the day prior to the incident and were also relatively high during the peak month of January (up to ~7,000 cfs). At these high flows, steelhead were likely confined to spawning in Hatchery Side Channel and river margins as depths and velocities moved away from spawning suitability criteria (Kindopp and Kurth 2003). When flows from the spillway were stopped and flows in the LFC returned to ~ 600 cfs, it is likely that redds constructed on the river margins were stranded. As the low flow channel increased in flow it is unlikely that the river margins provided preferable spawning habitat for steelhead, but it is possible. However, Hatchery Side Channel would have remained relatively stable due to its relative protection from high flows (up against the levee) and at least some redds did remain viable in this area. Surveys conducted in 2017 collected age-0 steelhead in Hatchery Side Channel, indicating successful spawning and incubation did occur. Embryos incubating in dewatered redds can continue to develop and survival of those embryos depends on the length of time dewatered, developmental stage and the environmental conditions in the intragravel environment (Neitzel and Becker 1985). No surveys were performed to evaluate redd stranding and flows did eventually increase above pre-incident levels. However, it is likely that flow fluctuations combined with the long period of minimum flows in the LFC (> 7 days), resulted in some stranding of steelhead redds that reduced embryo survival or caused total loss of some redds. However, because steelhead are winter spawners they have evolved to spawn under highly variable flows, presumably waiting for ideal conditions to spawn or aborting spawning altogether. Being semelparous, steelhead do

not have to spawn in any given year and some may have chosen to return to the ocean without spawning.

Juvenile Chinook Salmon

The Spillway event occurred during a period of time when most juvenile fall-run Chinook Salmon and nearly all juvenile spring-run Chinook Salmon have typically emigrated downstream from the affected area (CVPIA Comprehensive Assessment and Monitoring Program data, 2000-2015). The stranding that did occur for fall, spring, and late-fall run Chinook Salmon was largely concentrated in the high-flow channel, indicating that most fish had either emigrated downstream prior to the event, or had been transported downstream by high flows. Fall-run Chinook Salmon were the most disproportionately affected, as they were the only run less than 50mm in FL, on average, during the time of year the event occurred. Fall-run Chinook Salmon juveniles were the most abundant salmonid recovered during stranding sampling (30.3% of total catch).

Spring-run juvenile Chinook Salmon were the second-most abundant salmonid sampled during the event, accounting for 1.6% of the total Chinook Salmon catch. Spring-run Chinook Salmon are typically nearly 70 mm by late February, making them less vulnerable to stranding during this time of year than fall-run Chinook Salmon, on average. Most of the spring-run Chinook Salmon encountered were recovered alive (96%) from wet pools.

While winter-run Chinook Salmon are not known to spawn in the Feather River, two winter-run sized fish were sampled from wet pools in the high-flow channel. These individuals were more likely either the progeny of early-spawning spring-run Chinook Salmon, or were Feather River Hatchery fall-run Chinook Salmon that had been released into Lake Oroville during prior years (White et al. 2017). Extrapolated stranding estimates were not available for winter-run juvenile Chinook Salmon.

Late-fall run Chinook Salmon spawn only occasionally in the Feather River, mostly resulting from strayed Coleman National Fish Hatchery adults. As the 21 late-fall sized Chinook Salmon sampled were all larger than 200 mm on average, it is likely that they were actually stocked hatchery fall-run Chinook Salmon that came over one of the spillways from Lake Oroville.

The extrapolated stranding estimate for adult Chinook Salmon was 29 individuals. This estimate only applies to the low-flow channel, where three individuals were recovered; two individuals were sampled from the high-flow channel, but area measurements were unavailable. The result is that total stranding of adult Chinook Salmon, while likely not substantial, is probably underestimated for the spillway event. Based on the size of

most individuals and the timing of the event, these were likely fall-run Chinook planted in Lake Oroville in prior years.

Conclusion of Down-Ramping Effects

Stranding surveys revealed low mortality of juvenile and adult salmonids in wet pools although some mortality was observed. Most of these pools were reconnected to the main channel with subsequent high flows and provided opportunities for stranded fish to return to the river. Thus, fish may have actually obtained a growth benefit from access to these floodplain habitats. Additionally, previous juvenile monitoring in Feather River rotary screw traps suggests that most fall and spring-run Chinook Salmon had likely already migrated out of the action area when the spillway incident occurred. Stranding estimates in dry pools could not be calculated and mortality would have been 100% in these areas. The mortality that was observed indicates there was an adverse impact of stranding due to emergency water operations. This affected spring and fall-run Chinook Salmon and steelhead. Additionally, there were likely adverse impacts on steelhead embryos due to stranding of redds resulting from emergency water operations. No Green Sturgeon were detected or observed in stranding surveys. Thus, it is unlikely there were adverse impacts on this species.

Straying Effects

Spring-run Chinook Salmon enter the Feather River and hold from March through October and fall-run Chinook Salmon enter the river between August and December. Thus, there was minimal overlap between the spillway incident and migration of Chinook Salmon and it is unlikely that any straying of these runs would have occurred. Adult steelhead enter the Feather River between August and December and spawning occurs between December and March with a peak in January (Kindopp and Kurth 2003). Although the spawning period overlapped with the spillway incident, most fish had likely already arrived on the spawning grounds. All steelhead produced at CV hatcheries are marked with an adipose fin clip but are not tagged to identify hatchery of origin. Thus, it is unknown if the incident caused straying of out-of-basin steelhead into the Feather River or Feather River fish to other basins. The timing of the incident makes it unlikely that straying of steelhead occurred. Genetic data routinely collected at all CV hatcheries could provide some answers to the steelhead straying question but the data are not available at this time.

Feather River Hatchery Effects

Description

Elevated levels of suspended sediment are associated with negative effects to salmonid spawning, growth, and reproduction processes (University of Washington, 2001). Elevated sediment in hatchery water can smother eggs and deprive the embryos of required oxygen to survive and develop, reduce juvenile feeding success, leading to reduced growth rates, gill trauma, and disruption of homing performance. These effects can impact salmonids in both the hatchery and natural environment.

In response to potentially harmful levels of dissolved oxygen and turbidity that could affect the health and survival of eggs and fry housed at the facility, CDFW staff began monitoring within the FRFH on February 9, 2017. Monitoring continued until May 17, 2017.

Approximately 2 million spring-run Chinook Salmon and about 4.2 million fall-run Chinook Salmon were moved to the Thermalito Annex facility, where water is sourced from a well and not affected by the sediment movement in the Lower Feather River. In addition, a sedimentation channel and filtration system was set up at the FRFH for the 2.5 million fish and 750,000 CCV steelhead eggs that were not moved from the hatchery due to space constraints and fragility of the eggs. The filtration system for the eggs failed during the incident, so an alternate plan was put into place using a fire hydrant as the source for egg water, which was then filtered for chlorine and combined with raw water to decrease temperature and increase oxygen to the eggs. During the evacuation period, hatchery staff continued to mitigate for silt in the incubation stacks and inland ponds. Medicated and probiotic feed and salt baths were also employed to improve fish health at the hatchery during the spillway incident. A blockage in the screens at the aeration tower at the hatchery prevented the use of the settling ponds to decrease turbidity but, by the time the blockage occurred, turbidity had dropped to less stressful levels.

During the emergency response time frame, fish fed well and remained in good condition at the hatchery and Thermalito annex. Eggs and fry also remained in good condition (CDWR unpublished 2017). Due to overcrowding at the Thermalito Annex, juvenile growth was slowed (CDWR unpublished 2017). Spring- and fall-run Chinook Salmon were implanted with coded wire tags (100% spring-run, 25% fall-run) as part of normal monitoring associated with the hatchery. In July, all fish remaining at the FRFH were moved to the Thermalito Annex while repairs at the hatchery took place. Upon completion of hatchery repairs, CCV steelhead were moved back to the hatchery for rearing in August.

Recently, 120,000 CCV steelhead yearlings were released into the Thermalito Afterbay to provide opportunities for the angling community. Another 500,000 yearlings will be released in-river in early February 2018 and another 50,000 catchable yearlings will be released into the Afterbay in February 2018. This is approximately 300,000 more than

required for Oroville Dam mitigation (CDWR unpublished 2017). Fall- and spring-run Chinook Salmon production goals are to release 6- million and 2 million smolts annually, respectively (CDWR unpublished 2017, HSRG 2012a and HSRG 2012b). In 2017, approximately 5 million fall-run and approximately 1.7 million spring-run Chinook Salmon were released (Table 7.10-2), representing 83% and 85% of the annual production goal, respectively (CDWR unpublished 2017). In addition to the standard 6 million fall-run Chinook Salmon normally produced for mitigation, an additional 2 million fall-run Chinook will be reared, tagged, and released from the FRFH in the spring of 2018 (CDWR unpublished 2017).

Table 7.10-2. 2017 FRFH releases of spring- and fall-run Chinook Salmon

Release Date	Number Released		Feather River	Bay
	Fall-Run	Spring-Run		
3/20/2017		1,054,757	x	
4/4/2017		645,134	x	
4/24/2017	521,106		x	
4/26/2017	1,017,308			x
5/8/2017	509,119		x	
5/11/2017	862,500			x
5/18/2017	725,162			
5/19/2017	295,255			x
5/25/2017	528,912			x
5/26/2017	530,780			x
Total	4,990,142	1,699,891		

Conclusion of Hatchery Effects

Adverse effects of the Spillway Incident on juvenile CCV steelhead at the hatchery were unlikely due to management actions taken to ensure survival of eggs while housed in the hatchery as well as once moved to the Thermalito Afterbay as no significant mortality occurred at either location.

Impacts of the spillway incident on juvenile fall-run Chinook Salmon and juvenile spring-run Chinook Salmon rearing at the hatchery were minimized because DFW took appropriate measures to maintain water quality and production.

Effects to Green Sturgeon

Sturgeon were first detected with a Dual Frequency Identification Sonar (DIDSON) January 24, 2017, in the lower Feather River (n=1) and therefore were in the system during the Emergency and the Recovery Response Actions to the Emergency. Both Green and White Sturgeon were identified in the Feather River and sturgeon occupied several locations throughout the river. Green sturgeon were first confirmed in the LFC downstream of the Fish Barrier Dam near Table Mountain Bridge on May 2, 2017. A milting male was tagged with an acoustic telemetry tag on May 2 and another was tagged on May 3. A DIDSON survey at that time suggested at least 25 sturgeon were present; air bubbles in the water made it impossible to survey the area from the Fish Barrier Dam to about 30 meters upstream of Table Mountain Bridge so it is highly probable that a number of sturgeon were not detected. Egg mats were deployed on May 3 when flows were around 4000 cfs but were pulled on May 8 when DWR decided to increase flows in the next few days to about 30,000 cfs to draw down the reservoir before the FCO Spillway Gates were closed on May 19. Mats were redeployed on May 17 when notice was received that flows would drop to 6750 cfs in the LFC over the weekend when the FCO Spillway Gates closed. Two well-developed Green Sturgeon eggs were collected below Table Mountain Bridge on June 5; these were the only eggs collected throughout the entire survey. On June 8, DWR began to drop flows in the LFC to conserve water; at this time, DWR was no longer operating as part of the Recovery Response but under normal flow operations. DIDSON surveys indicated over half of the adult sturgeon outmigrated from the area by June 12. Larval sturgeon were collected for the first time ever in the Feather River on June 13 (n=10) and then again on June 21 (n=1).

Evaluation

Sturgeon were detected in the system as early as January 24 near Shanghai Bend. However, based on several years of unpublished telemetry data, the peak of sturgeon migration into the Feather River generally occurs after March 15 (Seesholtz, personal communication) so it is likely that only a small fraction of the sturgeon population experienced the Emergency and that most affects (both positive and negative) stemmed from Recovery Response Actions to the Emergency. The majority of spawning likely occurred while flows were higher in April and May when detection of eggs and larvae were harder to document due to the dilution effect from the large volume of water that was being sampled. It is very likely that conditions in the LFC were close to optimal for sturgeon spawning at this time. The spawn timing is supported by the two milting male Green Sturgeon DWR tagged in early May which indicates adults were already in spawning condition. It is unknown if the adult sturgeon emigrated from the LFC in mid-June because the spawn was over or because of the decrease in flows.

Fine sediments deposited in sDPS Green Sturgeon spawning habitat in the Lower Feather River may have negatively impacted embryo and larval survival but not at a level that would have a population impact. There was likely little impact on sturgeon embryo and larval survival or on critical habitat Physical and Biological Features (PBFs) of substrate type, size, and sediment quality during April and May. The high flows in the LFC in April and May likely kept fine sediment from settling out in the spawning area and instead may have provided a positive effect. The tail end of the spawning season likely was impacted slightly by sediments due to the flow decrease. It was noted during egg and larval sampling during June that sediments were not swept out of the area as rapidly and there was a concentration of particulates in the smaller volume of water. The eggs appeared in good condition since they were well developed and did not have any fungal growth on them; however, this is based on a very small sample size obtained on a single day. Larval sturgeon collected in June were fairly small (22-27 mm) and may have been impacted if particulates accumulated in the interstitial spaces used for cover or the open spaces in which they feed.

Overall Effects Determination

The Oroville Dam Spillway incident resulted in emergency operations that had adverse, and potentially adverse, impacts on special status species in the action area. Turbidity as a result of (1) debris removal in the Diversion Pool, (2) spillway failure, and (3) emergency spillway operation exceeded levels that may interfere with juvenile salmonid feeding behavior and had potentially adverse effects on juvenile CV spring- and fall-run Chinook Salmon and CCV steelhead rearing in the action area through reduced growth and impacts to macroinvertebrate food sources. However, the limited duration of elevated turbidity and the ability for juvenile salmonids to access high quality floodplain rearing habitat likely outweighed the adverse effect of turbidity.

Emergency water operations as a result of the incident caused rapid down-ramping rates and resulted in stranding of juvenile and adult salmonids in off-channel pools. In pools that remained wet, mortality was low and subsequent flows reconnected most of these habitats with the main river channel. However, mortality was 100% in pools that desiccated rapidly. A large proportion of juvenile CV spring- and fall-run Chinook Salmon had likely already migrated out of the action area but juvenile CCV steelhead would have been actively rearing. Thus, there were potentially adverse effects on CV spring- and fall-run Chinook Salmon and CCV steelhead. No Green Sturgeon were observed or detected during stranding surveys and there was likely no adverse impact on this species.

At the Feather River hatchery, CCV steelhead and juvenile spring- and fall-run Chinook Salmon were not adversely affected by the spillway incident due to measures taken to protect incubating eggs and juveniles.

Increased turbidity from dredging and spillway erosion and emergency spillway operation potentially had an adverse effect on critical habitat and EFH through deposition of fine sediment into spawning gravel, however, bedload movement suggests this did not occur. If this did occur, it would have impacted CCV steelhead in 2017 and may potentially impact CV spring- and fall-run Chinook Salmon spawning beds in future years. However, high flows in the Feather River persisted well after the spillway incident and likely transported any fine sediment deposited during the high turbidity periods.

7.11 Cultural and Historic Resources

This section describes the affected environment for cultural resources and the potential effects that the emergency response and the continuing recovery operations have had on cultural resources.

7.11.1 Affected Environment

Cultural resources are defined as prehistoric and historic-era archaeological sites, Traditional Cultural Properties, sites of religious and cultural significance, and architectural properties (e.g., buildings, dams, and structures). This definition includes historic properties as defined by the National Historic Preservation Act (NHPA).

The Area of Potential Effects (APE) for prehistoric and historic archaeological resources, ethnographic and ethnohistoric resources, and historic structures was initially defined within the existing FERC project boundary as including areas upstream of, adjacent to, and downstream of Oroville Dam including a portion of Lake Oroville located approximately 0.5 miles upstream of Oroville Dam, Oroville Dam and adjacent damaged areas and project features, and the segment of the Feather River (Thermalito Diversion Pool) extending downstream from the dam to the Thermalito Diversion Dam, Thermalito Power Canal, and Fish Barrier Dam. The APE has been expanded twice to include six recreation sites (Federal Energy Regulatory Commission, 2017d), and additional acreage within the OWA (Federal Energy Regulatory Commission, 2017e).

For purposes of Section 106 of the NHPA, FERC is the lead federal agency. DWR was designated by FERC as its non-federal representative for conducting consultation with the California State Historic Preservation Officer (SHPO) for the emergency response and recovery activities associated with Oroville Dam (undertaking) in a letter dated March 31, 2017(a) (Federal Energy Regulatory Commission, 2017a). DWR initiated consultation with the SHPO on April 24, 2017. At that time, DWR and FERC were consulting with the SHPO on the identification of historic properties and findings of effect for activities included in the undertaking under the regulation for emergency situations at 36 CFR 800.12.

An undertaking is defined as a project, activity or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

On July 5, 2017, a Programmatic Agreement (PA), as authorized by 36 CFR 800.14, was executed between FERC and the SHPO; the PA currently governs compliance with Section 106 of the NHPA for the undertaking and provides guidance on the process for submittal of additional findings of effect, the timeframe for agency review, and steps towards resolution of effects.

7.11.1.1 Cultural Context

Information on the cultural resources in the project area is centered on the results of three technical studies prepared for the FERC Project No. 2100 relicensing: a historical and archaeological inventory (Selverston, Markwyn, Walker, Delacorte, & Basgall, 2005); an ethnographic and ethnohistoric inventory (McCarthy, 2004); and an inventory and evaluation of the buildings and other structural elements of the Oroville Facilities (Herbert, Webb, & Blosser, 2004). The reader is referred to these reports for detailed descriptions and discussion of the previously recorded cultural resources.

The section below is a brief chronological review of the cultural context and archaeological record.

7.11.1.2 Prehistory

Native Americans have called the Feather River region home for at least 3,000 years and use continues to this day. Resources needed for food, shelter, clothing, and the pursuit of a variety of ceremonial and sacred practices were available to the people who inhabited the area prehistorically. Over time, subsistence adaptations increasingly focused on the gathering and use of fish, large mammals, and acorns supplemented by other plants and animals. Technological advancement can be observed in changes in weaponry, milling equipment, and textile arts. Trade networks and the development of regional religions reflect an increase in social organization through time.

The basic outline of prehistoric cultural chronology in the project area and environs was first developed by Olsen and Riddell (1963) and later expanded and elaborated by Ritter (1968, 1970) and Kowta (1988). The earliest securely dated archaeological complex in the Lake Oroville area is known as the Mesilla Complex, which has been dated between ca. 3,000 and 2,000 years Before Present (BP). This was followed by the Bidwell Complex (ca. 2,000–1,200 BP), the Sweetwater Complex (ca. 1,200–500 BP), and the Oroville Complex (ca. 500–150 BP). The Oroville Complex represents protohistoric Konkow-Maidu. The Kuksu religion was probably present in some form during this late period. Political organization was very similar to the pattern described in the

ethnographic literature, consisting of autonomous tribelets. Population density is believed to have reached its highest levels at the time of Euroamerican contact.

The project area contains a diverse array of prehistoric archaeological sites including small bedrock milling sites used for processing plants, limited lithic scatters serving short-term or specialized purposes, and extensive open-air residential sites that may have been used as village locations for extended periods of time. Sites assigned to the latter category often contain several different types of tools and other artifacts, as well as evidence of semi-subterranean house features and/or midden deposits.

7.11.1.3 Ethnohistory

Native Americans living in the study area spoke closely related dialects of the Konkow language, a sister language to Maidu (Northeastern or Mountain Maidu) and to Nisenan (Southern Maidu). Together, they make up the Maiduan language family, classified as a member of the Penutian language stock (Shipley, 1978). The Konkow were organized in village communities in which a larger, major village provided the central ceremonial and political focus for three to five smaller villages, with a total population estimated at 200 people. Chiefs of these communities were known for their leadership ability, wealth, and generosity (Dixon, 1905); (Kroeber, 1925). Subsistence was based on a seasonal round of gathering, fishing, and hunting. Salmon, deer, acorns, and pine nuts were among the most important food items. Elaborate ceremonies, such as the Kuksu cult, were practiced. Trade and traditional games were held with neighboring tribes. The influx of Spanish and Euroamerican explorers, trappers, early settlers, and cattle ranchers in the early 1800s introduced diseases and disrupted the environment and traditional Native American practices. With the onset of the Gold Rush in 1848, intensive settlement and mining activities along the Feather River severely affected the fishery and displaced Native American inhabitants. Ultimately, the Maidu experienced a loss of nearly 90 percent of their population and virtually all their lands from Euroamerican colonization. Today local traditions, Konkow language, and basketry classes and festivals, such as the Feather River First Salmon Ceremony, perpetuate traditional values, practices, and community involvement.

7.11.1.4 History

The Mexican rancho period in northeastern California began in the 1840s, but soon ended with the American takeover of California. John Bidwell found gold on the Feather River at what became known as Bidwell's Bar. By 1850, the Feather River was a major gold-producing area, with easily worked placer deposits giving way to mining corporations as mining operations became more complex with reservoirs, dams, and extensive ditches. Later hydraulic mining and dredging became the preferred means of

extracting gold ore. This latter process continued well into the 20th century and is reflected in approximately 8,000 acres of dredger tailings in the OWA.

Following the arrival of the miners, the foothills and valleys along the Feather River became places for ranching and agriculture—first cattle, then wheat, and later fruit, rice, and other crops. Local timber harvesting was initially conducted to support the mining industry, then on a more regional scale to provide lumber for residential and commercial use. The rise of agriculture was tied to the establishment of irrigation and reliable transportation systems. In the 20th century, the area became an important source of hydroelectric power and a vital source of water for California.

The historic-era archaeological sites in and around Oroville represent a variety of developmental themes, including transportation, settlement, mining, water conveyance systems, industry and commerce (e.g., logging), and agricultural development. Some archaeological resources are representative of more than one of these major themes, such as a ditch that was constructed for mining purposes and later used for agricultural pursuits.

7.11.1.5 Historic Structures

Historical structures associated with the Oroville Facilities include the dams, power plants, reservoirs, and canals associated with the hydroelectric facilities, along with the Lake Oroville Visitors Center, the FRFH, and the DWR Oroville Field Division facility on Glen Drive. Two of these resources- Oroville Dam and the Hyatt Pumping-Generating Plant, appear to be eligible for inclusion in the National Register of Historic Properties (NRHP) as individual properties, and they, along with 12 additional facilities, are all considered contributing elements to a proposed Oroville Division Historic District under criteria A and C, as defined in NRHP. Elements of the built environment not directly associated with the hydroelectric facilities, such as campgrounds, marinas, roads, and trails, were built following construction of the hydroelectric system. No structures located within the APE have been formally determined to be historic properties, including those associated with the Oroville Facilities.

7.11.1.6 Field Methods

On February 8, 2017, the day after erosion was observed on the FCO Spillway located adjacent to the Oroville Dam, DWR began working to identify known cultural resources situated in close proximity to the spillway and its potential overflow area. Data from the baseline cultural resources surveys completed by DWR as part of the Oroville Facilities relicensing process was used for this task and later to complete pre-construction conditions assessments. Review of the data revealed 17 previously recorded archaeological sites or features in the vicinity. Five prehistoric sites were directly

downhill from the Emergency Spillway. Two of the sites were bedrock mortars; the other three were dual-component occupation sites first recorded in the 1960s and updated with additional information during the 2002 FERC surveys. A map showing sensitive areas to be avoided was prepared to guide decisions in planning access roads and other ground-disturbing activities. The map was also used by DWR archaeologists to find and flag known cultural resources for avoidance. When water flowed over the Emergency Spillway for the first time in the history of the reservoir on February 11, 2017, severe erosion occurred downslope and crews with heavy equipment worked 24 hours a day to repair damage caused by the runoff.

Due to safety concerns, DWR archaeologists were not able to access the APE until February 19, 2017. The initial fieldwork consisted of relocating previously recorded sites on the hillside below the Emergency Spillway and along Burma Road to assess whether the release of water over the Emergency Spillway caused any damage to or loss of known archaeological sites. All previously recorded sites were found, including sites situated on the hillside in the direct path of the water release. During the field visits, the sites were flagged with caution tape. The tape was replaced later with barbed wire fencing or K-rail. Actions then shifted to identifying sites affected by clearing areas for stock pile locations and installation of temporary shoofly transmission lines. Archaeological village and occupation sites were given the highest priority for protection among recorded cultural resources.

Consultant archaeologists were contracted and arrived on March 14, 2017, to assist DWR archaeologists and conduct intensive pedestrian surveys throughout the APE for various activities related to the undertaking. During the response period, the surveys occurred either prior to or shortly after the commencement of work in a given location to confirm the presence or absence of prehistoric and historic-era archaeological sites, multi-component sites, and historic-era structures. Locations of recovery period activities were surveyed ahead of any work. Pre-construction condition documentation included relocating and photographing previously identified features, recording existing natural or construction related impacts, and preparing updated DPR 523 forms for each previously recorded resource and new DPR-523 forms for newly discovered resources.

All surveys were conducted under the supervision of archaeologists meeting the Secretary of the Interior's Professional Qualifications Standards (SOIS) for Archeology. Estom Yumeka Maidu Tribe (Enterprise Rancheria) representatives were present during most of the surveys. The intensive pedestrian survey strategy consisted of walking the ground surface in systematic parallel transects spaced at no greater than 20 meters apart and using Global Positioning System (GPS) equipment to collect field data. Future surveys for ongoing work will be conducted in a similar manner.

Construction monitoring is ongoing and will continue in the future as necessary. DWR archaeologists screened proposed work activities to determine when construction monitoring was needed. Activities involving ground disturbance in sediment not obviously disturbed by modern activities or involving ground disturbance near recorded cultural resources were monitored. Enterprise Rancheria representatives accompany DWR and consultant archaeologists during monitoring activities. Typically monitored work activities include: grading, cutting,, geotechnical borings,, mechanized vegetation removal,, crane pad construction,, and transmission line and tower wreck outs.

7.11.1.7 Recorded Cultural Resources

Documented cultural resources within the APE mostly consist of resources identified during relicensing studies; however, new discoveries have been made during recent surveys, especially following the clearing of vegetation. Based on the review of the previous studies and the results of fieldwork conducted following the Spillway Incident, which is on-going and has not yet been finalized, over 200 cultural resources have been identified within the APE, a little more than half fall within identified project components. The resource types include prehistoric sites, prehistoric isolates, historic sites, multicomponent sites, built environment features, historic districts, and a tribal resource.

Several impacts to sites that predate the undertaking were noted; these are either from earlier construction or maintenance activities in the APE or through damage done during the water releases. The impacts mostly consist of grading and dozing access roads and pedestrian trails for the construction and maintenance projects, and substantial erosion, including cutting deep into underlying bedrock, from the water releases. Ten previously recorded sites were found to no longer exist, due to impacts that have occurred over the past 50 or so years from the construction of the dam, erosion, or other means before the Spillway Incident.

There have also been unanticipated discoveries, including OPL-BD-FEA-015, described as an alignment of stacked rock and a lumber flume, which was reported to the PA parties by DWR on August 31, 2017, and acknowledged by the SHPO the next day. A month earlier, on July 28, 2017, DWR reported the discovery of Oroville 13, a bedrock mortar, to the PA parties. These finds were reported in the study for the DWR permanent transmission line reroute. Most newly discovered sites within the APE will be reported in connection with a project component.

Table 7.11-1: Tally of Resource Types within Project Components

Prehistoric	18
Historic	81
Multicomponent	11
Tribal	1
Built Environment	6
Total	117

Table 7.11-1 provides a tally of the individual resources across the project components. It should be noted that some resources exist within areas where project components overlap. As a result, adding up the resources by component produces an inflated number of resources. Below is a breakdown of the distribution of resources within various project components (Figures 7.11-1, 7.11-2 and 7.11-3 and Tables 7.11-1 through 7.11-14):

(B) Burma Road Improvements – There are 40 known resources within the footprint of the Burma Road component of the project. They include indigenous house pits, bedrock milling features, artifacts, and ceremonial areas as well as historic-era foundation pads, hearths, artifact deposits, mining features, dirt roads, stacked rock walls and fences, trails, orchards, privy pits, and ditches. The historic-era materials likely span from the 1850s and 60s to the late historic era (1950s-1960s).

(D) Dredging – There are 18 known resources within the footprint of the Dredging component of the project. They include indigenous bedrock milling features, artifacts, house pits, and recorded human remains; also, historic-era building pads, foundations, ditches, mining features, orchards, domestic artifact deposits, dirt and gravel roads, ditches, and riverbank retaining walls.

(Ei) Emergency Spillway Initial Water Release – There are 7 known resources within the footprint of the Emergency Spillway Initial Water Release component of the project. These resources consist of prehistoric and historic-era occupation sites, historic-era roads, and features related to the Emergency Spillway.

(Er) Emergency Spillway Improvements – There are 11 known resources within the footprint of the Emergency Spillway Improvements component of the project. These resources consist of indigenous bedrock milling features and artifacts, historic-era mining features, roads, and Emergency Spillway-related features.

(ES) – Erosion and Sediment Control – There are 33 known resources within the footprint of the Erosion and Sediment Control component of the project. These resources consist of indigenous house pits, artifacts, and bedrock milling features; they also include historic-era farmsteads, dirt roads, ditches, fences, and domestic artifact deposits.

(F) Boundary Fence – There are 20 known resources within the footprint of the Boundary Fence component of the project. These resources consist of indigenous bedrock milling features, artifacts, midden, and house pits; as well as historic-era artifact concentrations, trails, foundations, mining features, terraced slopes, fences, ditches, orchards, and exotic vegetation.

(FP) Fiber Optic and 13.8kV Powerline – There are 21 known resources within the footprint of the Fiber Optic and 13.8kV Powerline component of the project. These resources include indigenous bedrock milling features and historic-era sites and features, including artifact scatters, rock walls, building pads, mining features, ditches, dirt and gravel roads and orchards and exotic vegetation. This component follows the alignment of the Western Pacific Railroad grade and terminates at the Hyatt Powerhouse Switchyard.

(O) OWA Aggregate Extraction – There are two known resources located in the proposed borrow areas within the OWA, dredge tailings and a railroad bed (P-04-000465 and -002393).

(Pe) 230kV Powerlines Eagle Nest – Four trees chosen for surrogate eagle nest structure installations are located within or near three known historic-era resources, including a rock-lined drainage with scattered artifacts, ditches, and other mining-related features.

(Pp) Pacific Gas and Electric, Co. (PG&E) Shoofly Powerline – There are 8 known resources within the footprint of the PG&E Shoofly component of the project. These resources are all from the historic era and include roads, a railroad bed, and features related to mining and farm steading.

(Ps) DWR Shoofly Powerline – There are three known resources within the footprint of the DWR Shoofly Powerline component of the project. These resources include two fence lines and an indigenous bedrock milling feature.

(PI) DWR Lattice Tower Wreck Out – There are three known resources within the footprint of the Lattice Tower Wreck Out component of the project. These resources consist of two historic-era roads and a ditch.

(R) Spillway Reconstruction – There are 20 known resources within the footprint of the Spillway Reconstruction component of the project. These resources include indigenous bedrock milling features and historic-era ditches, fences, roads, features related to the activities and living areas of miners, and features related to the FCO Spillway.

(S) Spoils Piles – There are three known resources within the footprint of the Spoils Piles component of the project. These resources include a historic-era dirt road, a prospect pit, and a fence.

7.11.2 Environmental Effects

The work performed by DWR to stabilize and remediate the damaged spillway facilities broadly falls into two groups; Response Actions and Recovery Actions, with construction activity mostly occurring on the slopes adjacent to the spillways. The Response Actions include FCO Spillway releases; construction of access roads, stockpiles and staging areas; stabilization of the FCO and Emergency Spillways; in-water and land-based debris removal; and installation of emergency shoofly powerlines for both DWR and PG&E. The Recovery Actions include reconstruction of the FCO and Emergency Spillways (with the addition of a secant pile wall); continued in-water debris removal; permanent reroute of both DWR and PG&E primary transmission lines (previously analyzed in separate Environmental Assessments prepared by FERC in August 2017); wreck-outs of DWR and PG&E shoofly lines and original transmission line lattice towers; installation of a 13.8kV powerline and associated fiber optic communication system; repair of radial gates; improvements to access roads including Burma Road; construction of work pads, staging areas and spoils sites; removal of borrow material from OWA and Spillway Left; and activities at the FRFH

Impacts to cultural resources from the emergency response and the subsequent on-going recovery operations have varied depending on the activity. The initial response consisted of clearing vegetation from the sides of the FCO Spillway and downstream of the Emergency Spillway for better observation of spillway conditions and to remove trees and other debris that could wash down and accumulate against the TDD. Roads were also excavated and graded to allow access to various parts of the spillways and to the TDD staging area. The access road to the Spillway Recreation Area was washed out when the Emergency Spillway was used for the first time in February. The parking lot is now a command center for the undertaking while Burma Road and sections of the Dan Beebe and Brad Freeman Trails have become haul routes.

As the response phase transitioned to the recovery phase, potential impacts to cultural resources increased. In addition to the grading of numerous access and haul roads to facilitate construction, there was active excavation and blasting of soil and rock to

stabilize the lower chute of the FCO Spillway. Other landscape-altering activities include tree and vegetation removal, rock crushing operations to produce aggregate for concrete, the building of cement batch plants, and the creation of soil and rock stockpiles from rock and sediment dredged from the TDP.

7.11.2.1 Component Activities

The project components within the APE that posed the most potential to affect cultural resources are described below. The Area of Direct Impact (ADI) for some of these activities overlap. Work may be on-going.

(B) Burma Road Improvements – Widening of, and improvements to, Burma Road along the north side of the TDP. Work includes: clearing and grubbing vegetation; cutting, filling, and grading; installation of box culverts; installation and replacement of metal pipe culverts; road compaction; placement of aggregate base road surface; and paving with asphalt. Proposed new construction to accommodate large vehicles and large loads would include Power Canal Road and Cherokee Road and involves paving and additional widening.

Impacts: Of the 40 known resources within the Burma Road component, 5 historic-era resources and 2 resources with both prehistoric and historic-era elements have been directly impacted and 3 historic-era resources, 1 prehistoric resource and 1 resource with both prehistoric and historic-era elements have been indirectly impacted. The direct impacts include damage from culvert installations, widening of Burma Road, creation of a spoils pile and Utility Terrain Vehicle (UTV) tire tracks. The indirect impacts are due to fences crossing over linear features, clearing and grubbing, and erosion from wave action.

(D) Dredging – Removal of sediment from the TDP by barge-mounted excavators. Dredged material is off-loaded at barge landings and transferred to spoils piles locations set up within the APE. The ability for the TDP to convey adequate flow may require continued in-water debris removal.

Impacts: Of the 18 known resources within the Dredging component, 1 historic-era resource, a fence, was directly impacted and no longer exists. Indirect or minor impacts from inundation, erosion by wave action, or the crossing of a fence, were sustained by 1 prehistoric resource, 1 historic-era resource and 2 resources with both prehistoric and historic-era elements.

(Ei) Emergency Spillway Initial Water Release – Scouring of the hillside due to the initial release of water over the Emergency Spillway, followed by deliberate vegetation removal.

Impacts: Of the 7 known resources within the Emergency Spillway Initial Water Release component, 1 historic-era resource, a fence, was directly impacted and no longer exists (the same fence listed above under Dredging). A resource with both prehistoric and historic-era elements was severely eroded. Another historic-era resource was impacted through conversion to a haul road. In addition, the slope below the Emergency Spillway was eroded.

(Er) Emergency Spillway Improvements – Stabilization of Emergency Spillway area. Work consists of: clearing and grubbing vegetation; cutting and grading; creation of new access roads; geotechnical testing; staging areas and work pads; placement of rock and concrete on slope immediately below spillway to armor the slope; and installation of a secant cut-off wall, crest cut-off wall and splash pad.

Impacts: Of the 11 known resources within the Emergency Spillway Improvements component, 3 historic-era resources were directly impacted. A segment of one of them, a fence, was destroyed by a spoils pile. The other two, a prospect pit and a stone dam, were also destroyed. Indirect impacts caused by clearing and grubbing occurred in the vicinity of 2 prehistoric sites and 1 historic-era site.

(ES) – Erosion and Sediment Control - Stabilization of on-site sediment primarily on the hillside adjacent to the FCO Spillway. Work consists of: placement of hydroseed, hydromulch, mulch, and fiber rolls; installation of concrete aggregate base and sediment traps at laydown, parking, and crane pad areas; creation of drainage swales; regrading roads and installation of v-ditches and compacted berms adjacent to roads; and culvert installation and maintenance.

Impacts: Of the 33 known resources within the Erosion and Sediment Control component, 14 historic-era resources, including roads, ditches and fences, and 1 resource with both prehistoric and historic-era elements, have been directly impacted and either are heavily damaged, some from conversion into haul roads, or no longer exist. Indirect impacts caused by clearing and grubbing occurred in the vicinity of 2 prehistoric resources and 1 historic-era feature.

(F) Boundary Fence – Installation of a fence line along the property boundary above Burma Road. Fencing consists of three to five-strand barbed-wire with T-post and wood post supports. Includes vegetation removal and accessing area using all-terrain vehicles on existing, unimproved dirt paths.

Impacts: Of the 20 known resources within the Boundary Fence component, 3 historic-era resources and 1 resource with both prehistoric and historic-era elements have been directly impacted with portions of these resources damaged by road widening, a spoils pile and UTV tires. Indirect impacts occurred to 5 historic-era resources, 2 resources

with both prehistoric and historic-era elements and 1 prehistoric site, mostly from the construction of the fence.

(FP) Fiber Optic and 13.8kV Powerline – Installation of a new underground fiber optic line and new 13.8kV electric transmission line with both overhead and underground components. Work consists of: clearing and grubbing vegetation; grading for associated access roads; trenching for underground lines; installation of conduit; and stringing of fiber optic cable on 230kV transmission structures.

Impacts: Of the 21 known resources within the footprint of the Fiber Optic and 13.8kV Powerline component, future construction is likely to directly impact 7 historic-era resources, 1 prehistoric resource, and 1 resource with both prehistoric and historic-era elements. Overall, 17 historic-era resources, 3 resources with both prehistoric and historic-era elements, and 1 prehistoric resource, are likely to be impacted either directly or indirectly by the future construction of this component.

(O) OWA Aggregate Extraction – Removal of material from the OWA to be used for roller compacted concrete (RCC) and as backfill. Aggregate would be excavated to an estimated depth of ten feet below ground surface. Material would be screened, separated by size and staged for off-haul. Approximately 80,000 cy of aggregate sized between 3 to 8 inches in diameter would be hauled to the spillway area. Material measuring outside this range would remain onsite and be spread over the areas of excavation. Work consists of: clearing and grubbing vegetation, widening portions of the existing roadway within the OWA, excavating aggregate.

Impacts: Of the 2 known historic-era resources located in the proposed borrow areas within the OWA, both would be directly impacted, but these impacts will be minor because the dredge tailings in that location have little to no integrity and the railroad bed has been used as a maintenance road for years.

(Pe) 230kV Powerlines Eagle Nest – Four trees were chosen for surrogate nest structure installations after an eagle nest was identified and removed by permit from a felled hazard tree. Work consists of hand carrying equipment and materials to the selected trees and climbing the trees to install materials.

Impacts: The 3 known historic-era resources surrounding and/or near the trees will be avoided or minimally impacted by walking in to get to the trees.

(Pp) Pacific Gas and Electric, Co. (PG&E) Shoofly Powerline – Installation and removal of a PG&E-owned temporary electric transmission line. Work consists of: clearing and grubbing vegetation; grading for associated access roads; cutting and grading for transmission tower construction; transmission tower construction (including excavation for piers) and line stringing; removal of transmission lines and towers.

Impacts: Of the 8 known resources within the PG&E Shoofly component, 6 of them suffered severe, direct impacts. The other 2 were avoided. All are historic-era resources and reflect transportation, settlement and mining themes.

(Ps) DWR Shoofly Powerline – Installation and removal of DWR-owned temporary electric transmission line. Work same as that for PG&E Shoofly Powerline.

Impacts: Of the 3 known resources within the DWR Shoofly Powerline component, the 2 historic-era fence lines have been severely impacted. The prehistoric resource has been avoided.

(PI) DWR Lattice Tower Wreck Out – Removal of the original DWR-owned lattice transmission towers near the FCO Spillway. Work same as that for PG&E Shoofly Powerline.

Impacts: Of the 3 known resources within the Lattice Tower Wreck Out component, the historic-era fence line and 1 of the 2 roads have been considerably impacted. The other road may have been impacted, its current condition is unknown.

(R) Spillway Reconstruction – Demolition and reconstruction, in the same location, of FCO Spillway. Work consists of: blasting, demolition and removal of existing concrete spillway; geotechnical testing; clearing and grubbing vegetation; cutting, filling, and grading for access roads, staging areas, and concrete batch plants; quarrying aggregate for roller compacted concrete (RCC), concrete backing and other uses; placement of new concrete and associated reinforcement; and establishment of temporary ancillary facilities (e.g., dewatering, etc.). Additionally, the radial gates on both the FCO Spillway and the Thermalito Diversion Dam were damaged. Both sets of radial gates will be returned to their original functions. Work consists of repair and replacement of hardware.

Impacts: Of the 20 known resources within the Spillway Reconstruction component, 9 historic-era resources, including the FCO Spillway, and 1 resource with both prehistoric and historic-era elements, have been directly impacted or no longer exist due to construction activities noted above. Indirect impacts occurred to 1 prehistoric site from clearing and grubbing.

(S) Spoils Piles – Placement of dredged sediment from the TDP in large piles. Work consists of: clearing and grubbing vegetation; cutting, filling, and grading for initial site; and placement of dredged sediment.

Impacts: All 3 of the known historic-era resources within the Spoils Piles component have been directly impacted. A portion of the fence line, the prospect pit and the road no longer exist, due to the creation of a spoils pile.

7.11.3 Findings of Effect

DWR submits effect recommendations for historic properties to FERC pursuant to the PA. FERC is responsible for making all findings of effect and for the resolution of adverse effects and disputes. The PA may be amended to include the resolution of effects to resources prior to its execution. Findings of effect have been made and will continue in the future for project component ADIs. Planned avoidance of cultural resources may lead to a finding of no historic properties affected.

The potential for adverse effects to cultural resources from the implementation of the above component activities was assessed in the context of each component's ADI. Project impacts, as well as pre-project impacts, were noted during site assessments prior to construction. Post-construction assessments also are planned.

In accordance with the PA, all cultural resources in the APE not previously evaluated for NRHP-eligibility are assumed NRHP-eligible for the purposes of the undertaking. Some resources may also be contributing elements to one of two proposed historic districts – the Forks of the Feather River Historic District (FFRHD) and the Oroville Division of the State Water Project Historic District (ODSWP).

One historic-era site that previously did not appear to be a contributor to the FFRHD, P-04-001926, was re-evaluated during the current project as part of a finding of effect effort following project impacts. The conclusion of the original evaluation held as the resource, a dirt road, was not found to be individually eligible for the NRHP or a contributor to the FFRHD. On October 17, 2017, the SHPO concurred with FERC that the resource was not eligible and on October 23, 2017, FERC made a finding of no historic properties affected for the creation of a rock quarry. Another historic-era resource, P-04-002609, was previously identified as a contributor to the FFRDH but a re-evaluation concluded that the resource was not eligible for the NRHP individually or as a contributor to the FFRHD as it did not meet NRHP criteria. The determination allowed FERC to make a finding of no historic properties affected on November 7, 2017, for the removal of an existing transmission tower.

Finding of effect documents were prepared for two built-environment elements of the proposed ODSWP, the Spillway (Newland, Kahn, & Anderson, 2017), submitted to FERC on July 21, 2017, and the Radial Gates (Grady & Newland, 2017) submitted to FERC on July 26, 2017. In both cases, the project would not result in an adverse effect or substantial adverse change to any character-defining features or contributing elements. No mitigation measures are currently proposed, but the effects of the work will be re-assessed if there are significant design changes, as specified in an August 29, 2017 letter from FERC to DWR. Recommendations for findings of no adverse effect within the OWA for the removal of aggregate and on the FCO Spillway for the

construction of a RCC platform were submitted to FERC by DWR on October 31 and November 3, 2017, respectively. FERC responded in agreement with the no adverse effect finding for the RCC platform on December 1, 2017 and for the OWA borrow area on December 14, 2017. Most recently, a recommendation for a finding of no adverse effect was made to FERC on December 4, 2017 for the installation of platforms for alternative eagle nest locations. FERC concurred on December 7, 2017.

The DWR transmission line reroute had finding of effect documentation prepared prior to the execution of the PA. The SHPO, in a letter on June 16, 2017, did not object to DWR's finding of no adverse effect. The combination of effects on CA-BUT-1105H, a large mining/habitation site, from recent and proposed future construction will likely constitute a cumulative adverse effect to CA-BUT-1105H. A finding of effect is in preparation for consultation with the PA parties. Additional finding of effect documents for new project components are likely before the end of calendar year 2018; mitigation measures may be included based upon the findings.

7.11.4 Mitigation

Avoidance of impacts to cultural resources is always the preferred option. DWR has been coordinating directly with the SHPO, FERC, FEMA, CalOES, and local Native American tribes to address potential impacts to cultural resources and to ensure that avoidance of cultural resources is practiced whenever possible. Measures have been put into place to minimize impacts to cultural resources throughout the life of the undertaking, including physical barriers, such as barbed wire fencing, K-rail, and caution tape; the use of hand tools and barring of mechanical clearing and grubbing within 50 feet of cultural resources; coordination with contractors to identify work staging and set up areas that avoid cultural resources; and the designation of Environmentally Sensitive Areas (ESAs) that are monitored by both archaeologists and tribal monitors when construction activities occur nearby. Other measures include: implement a monitoring and discovery plan; prepare detailed, updated site forms with photographs, archival data and feature drawings; conduct a post-construction condition assessment of the sites; and implement a data recovery plan in the event that archaeological or tribal monitors identify information-bearing deposits. These protective measures are consistent with the Historic Property Management Plan (HPMP) that was developed as part of the compliance with Section 106 of the NHPA for the relicensing of the Oroville Facilities. Prior to most ground disturbance activities, a WEAP training was provided to construction personnel, to provide education on the sensitivity of the APE, the kinds of resources that might be encountered, and the appropriate response to the inadvertent discovery of cultural resources.

Construction monitoring occurred daily through the summer of 2017, but will be on an as needed basis going forward. Activities for which monitoring was conducted were

those that included ground disturbance in sediment not obviously disturbed by modern activities or activities including ground disturbance near recorded cultural resources. Tribal monitors from Enterprise Rancheria accompanied consultant archaeologists during monitoring activities, with oversight by a DWR archaeologist. Examples of work activities that were monitored include: grading; cutting; geotechnical borings; mechanized vegetation removal; transmission line tower pad construction; and transmission line pull areas.

Impacts of project activities, with measures implemented by DWR to lessen or avoid them altogether, fall under seven broad categories:

Grading

This operation involves leveling and smoothing of the ground surface using heavy equipment and is conducted during road widening and staging area preparation activities. Excess soils either remain on-site as fill or are transported elsewhere to be used or stored.

Measures to Avoid Impacts: Archaeological and tribal monitors were present during grading at any area determined to be sensitive for containing cultural resources; known cultural resources were fenced off or flagged to keep equipment and construction personnel away from the resources.

Vegetation Removal

Cutting of brush and trees, followed by stump removal. The vegetation would then be crane-lifted out or dragged away by a backhoe, bulldozer, or bobcat and either stored nearby or trucked elsewhere within the APE.

Measures to Avoid Impacts: Archaeological and tribal monitors were present during vegetation cutting and clearing where it was determined that heavy equipment or clearing crews likely would encounter cultural resources. Hand clearing was prescribed for locations near known cultural resources, which were fenced off or flagged to keep equipment and construction personnel away from the resources.

Placement of Fill Material

Placing of fill quarried from other areas of the APE or dredged from the TDP directly below the FCO Spillway. Fill is used to repair flood damage and erosion, to level areas out for driving or staging, and to backfill construction. Large quantities of fill material are temporarily stored in the APE for anticipated repairs.

Measures to Avoid Impacts: Archaeological and tribal monitors were present during the quarrying of materials when in sediment but not when quarrying bedrock. Monitoring

took place during the placement of fill at any area determined to be sensitive for containing cultural resources. Dredging and loading operations were not monitored. Known cultural resources were fenced off or flagged to keep equipment and construction personnel away from the resources.

Construction:

Installing infrastructure for the Emergency Spillway and FCO Spillway reconstruction usually involved some form of ground disturbance, such as in the preparation of building pads, drilling for footings or cutting slopes for drainage.

Measures to Avoid Impacts: Archaeological and tribal monitors were present during all ground disturbing activities when they occurred within soils but not when quarrying bedrock. Monitoring took place during the placement of fill at any area determined to be sensitive for containing cultural resources. Known cultural resources were fenced off or flagged to keep equipment and construction personnel away from the resources.

Multiple impacts:

Pre-project impacts to sites combined with erosion from the spillway release and rapid post-event recovery and stabilization efforts in some cases resulted in the destruction of or severe damage to sites.

Measures to Avoid Impacts: Prior damage to sites was noted. Archaeological and tribal monitors were present during all ground disturbing activities occurring within soils. Known cultural resources were fenced off or flagged to keep equipment and construction personnel away from the resources.

Partial or complete erosion

Both known and undiscovered sites may have been lost after the water release that led to the FCO Spillway failure. The landscape was stripped down to bedrock and in many places erosion cut several feet into the bedrock. Existing drainages were scoured and the material transported into the TDP.

Measures to Avoid Impacts: Previously recorded sites that were lost were recorded as such and no further action was taken at these locations. Partially damaged sites were assessed and fenced or flagged. Archaeological and tribal monitors were present during all earth-moving activities at these locations.

Vehicle tracks

Operating heavy equipment over cultural resources sometimes created impacts to individual features or soil disturbance, depending on the moisture content of the soil and the type of equipment.

Measures to Avoid Impacts: Known cultural resources were fenced off or flagged to keep equipment and construction personnel away from the resources. Archaeological and tribal monitors were present during ground disturbing activities that occurred within soils.

DWR's ongoing consultation with the SHPO, the presence of tribal monitors during construction, employment of the PA, and carrying out any agreed upon mitigation and data recovery measures at potentially affected archaeological sites would negate any cumulative impacts to cultural resources.

7.11.5 Agency Coordination and Tribal Consultation

7.11.5.1 Agency Coordination

On March 31, 2017, FERC issued a letter to the USFWS, the NMFS, and the SHPO designating DWR as FERC's non-federal representative for informal consultation with USFWS and NMFS pursuant to Section 7 of the Endangered Species Act (ESA) and for consultation with the SHPO and other consulting parties pursuant to the regulations at 36 Code of Federal Regulations (CFR) Section 800.2(c)(4) implementing section 106 of the NHPA. The designation included informal consultation with the appropriate Native American tribes. DWR is delegated to perform tasks in support of FERC's compliance with Section 106, such as performing cultural resource surveys and studies, establishing areas of potential effect, identifying eligible properties, ascertaining any adverse effects to those properties, proposing mitigation to address adverse effects if needed, and developing a draft Memorandum of Agreement to memorialize any proposed mitigation. FERC, however, remains ultimately responsible for all findings and determinations made pursuant to Section 106.

Lead agency status per CFR § 800.2(a)(2) was delegated to FERC by FEMA in a letter dated April 20, 2017. The U.S. Army Corps of Engineers (Corps) has not delegated lead agency status to FERC and conducts its own compliance with Section 106. The Corps will delegate FERC as lead agency on a case by case basis. FERC further clarified DWR's role as non-federal representative for consultation under the ESA and NHPA for recovery to FEMA and the Corps in a May 18, 2017 letter.

Consultation with the SHPO was initiated by DWR in a hand-delivered letter on April 24, 2017. The SHPO responded on May 22, 2017, with guidance on the consultation process. Actions implemented prior to May 31, 2017, would be managed under an emergency declaration using the procedures at 36 CFR § 800.12, which provide for a 7-

day response period for consulting parties. A 30-day extension of the expedited review period (until June 30, 2017) was requested of the Advisory Council on Historic Preservation (ACHP) by FERC to allow time for the development of a two-party PA with the SHPO to address and formalize a mutually agreeable expedited process for the long-term stabilization and repair efforts. The final agreement was executed on July 5, 2017 with FERC and SHPO as signatories, FEMA is an invited signatory, and DWR, CalOES and the Enterprise Rancheria Estom Yumeka Maidu Tribe are concurring parties. The PA outlines the roles and responsibilities of FERC, FEMA, and DWR while implementing the undertaking. The effects of the undertaking on historic properties are considered in accordance with the stipulations of the PA. Regular teleconferences to update the agencies on DWR's activities under the PA began on May 1, 2017. DWR's proposed modifications to the APE and recommendations for Determinations of Eligibility and Findings of Effect are filed with FERC, which makes the final decisions.

7.11.5.2 Tribal Consultation

DWR, with assistance from the California Department of Parks and Recreation, immediately reached out to four federally recognized tribes in the Oroville vicinity on February 8, 2017: Berry Creek Rancheria of Maidu Indians, the Estom Yumeka Maidu Tribe of the Enterprise Rancheria, the Mechoopda Indian Tribe of Chico Rancheria, and the Mooretown Rancheria of Maidu Indians. Greenville Rancheria, another federally recognized tribe, and two non-recognized tribes (Konkow Maidu and Tsi-Akim Maidu) were contacted following a response from the California Native American Heritage Commission (NAHC) on March 29, 2017, with their contact information and negative results from a search of its sacred lands file. DWR has periodically reached out to all of these tribes and will continue to do so.

Enterprise Rancheria has participated in tribal cultural resource identification and monitoring of response and recovery activities since mid-February 2017. Daily tribal monitoring by Enterprise Rancheria members began on February 27, 2017. DWR initially met with the Enterprise Tribal Council on March 7, 2017, and with tribal elders in the field on March 17, 2017. The involvement of Enterprise following the unanticipated discovery of NL-1 along PG&E's rerouted transmission line and in the erosion reduction and stabilization of CA-BUT-182 along its shoreline edge was vital to the successful outcome of the activities conducted at these two sites. Consultation with Enterprise includes their Tribal Historic Preservation Officer (THPO) and is on-going. The latest formal meeting with the Tribal Council was held on August 28, 2017.

7.12 Geology, Soils, and Topography

7.12.1 Affected Environment

Geology

The Oroville Dam and associated facilities are located within the foothills of the Sierra Nevada, at the eastern edge of the Central Valley. The Sierra Nevada foothills are comprised of folded metamorphosed volcanic, sedimentary, and plutonic rocks of Paleozoic and Mesozoic age. Tertiary volcanics, sediments, and Quaternary deposits overlie the Paleozoic and Mesozoic rocks (Rizzo et al, 2014).

The Oroville Dam, reservoir, and other facilities sit within a metamorphic block known as the Smartville Complex. The Smartville Complex is a Jurassic-age, accreted, ophiolite sequence which includes deep ocean sediments, submarine volcanic, ultra-mafic, and igneous dikes (Rizzo et al, 2014). The dam and associated facilities are underlain by amphibolite. The amphibolite bedrock is fresh, hard, jointed, foliated, locally sheared, and weakly to strongly weathered. The most dominant joint set trends generally northeast-southwest and dips shallowly to the northwest. Shearing is dominantly north-south and dips vertically (DWR PG, 2016).

Facilities downstream of the Oroville Dam to the FRFH are located along the boundary between metamorphic rocks of the Smartville Complex and scattered sedimentary and volcanic deposits of the Tertiary Lone, Laguna, and Tuscan formations (FERC, 2007). River banks below Lake Oroville are comprised of slickens, tailings, floodplain deposits, alluvial edge, levees, and low quantities of bedrock and Tertiary sediments (FERC, 2007).

Soils

Soils upstream of the Oroville dam are derived from weathering of Mesozoic through Cenozoic metasedimentary, volcanic, plutonic, and sedimentary rocks. Soil profiles in the central and western portions of Lake Oroville are thick (FERC, 2007). Soil profiles in the eastern portion of Lake Oroville are thin. Along the Middle and South Forks of the Feather River, intrusive rocks decompose easily but do not form deep soil profiles (FERC, 2007).

Soils downstream of the Oroville Dam are found on level land and derived from river alluvium and mining debris. The predominant soils are fine sandy loam, loamy sand, and loam to silt loam. Minor soil types include clay, clay loam, sandy clay loam, sandy loam, silt loam, silty clay, sand and gravel, and river wash. Soils are mostly moderately deep to very deep, but range from shallow to very deep (FERC, 2007).

Seismicity

The Oroville Dam and associated facilities are located within the margin of the California Foothills Fault System (FFS). The FFS is a normal fault system, striking approximately 325°, dipping approximately 75° E, has a slip rate of about 0.05 mm/yr., and is about 360 km long and 60 km wide (Rizzo et al, 2014). FFS associated faults in the area of the dam and facilities include the north-northwest trending, near-vertical, dip-slip Melones and Spenceville Fault Zones. The Cleveland Hill Fault is a controlling seismic source for the Oroville Dam, due to its proximity. FFS faults have low activity (less than 0.1 mm/yr.) (Rizzo et al, 2014). Other pre-Quaternary age faults include the Long Ravine Fault, along the western side of Lake Oroville, the Oroville Fault, between Thermalito Diversion Dam and Thermalito Forebay, and the Thermalito fault, beneath the Thermalito Forebay (Rizzo et al, 2014).

Oroville Wildlife Area Borrow Site

The Oroville Wildlife Area tailings piles may be used as a borrow source for use at the Oroville Dam site. The material has been sampled utilizing a gradation testing procedure and the cobble was determined to be suitable for use on the Oroville Dam site.

7.12.2 Environmental Effects

Although the activities associated with the Oroville emergency response involved a substantial amount of earthwork that has changed local topography, they are expected to have little effect on the naturally-occurring rock, soils, or seismic conditions of the site. Aside from consumption of rock and removal of soil throughout the site and at the Oroville Wildlife Area site, the conditions of available rock and soil will continue to remain the same.

7.12.3 Agency Coordination, Public Involvement, Permits

The following table summarizes the coordination and permitting efforts related to geology, soils and topography.

Affected Resource Area	Impacts	Agency Coordination/Permits	Mitigation/BMPs
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Rock	Rock used in construction	N/A	N/A
Soil	Soil removal in some areas	N/A	N/A
Seismicity	None	N/A	N/A

7.13 Hydrology and Water Resources

7.13.1 Affected Environment

The Oroville Facilities alter the streamflow in the Feather River through flow regulation that includes diversions for water supply, flood management, water quality requirements of the Sacramento-San Joaquin Delta, and instream requirements. Although the Oroville Facilities use water from the Feather River Basin to generate electricity, these operations do not further alter the streamflow in the Feather River downstream of the Thermalito Afterbay Outlet. Streamflow alterations in the lower Feather River do vary based on different hydrologic water year types. The Feather River Basin drains a large portion of the eastern Sierra-Cascade geomorphic area in California, and its headwaters are located on the southeastern slope of Mount Lassen and along the Sierra Nevada crest. The drainage area is 3,624 square miles at the Feather River in Oroville (USGS Gage No. 11047000), located 0.4 mile downstream of the Thermalito Diversion Dam.

The Feather River Basin has mild, dry summers and heavy winter precipitation. Mean annual precipitation in the basin ranges from 11 inches in the driest areas to 90 inches in the northwestern portion of the basin near Mount Lassen. Monthly average precipitation varies considerably over the basin. For example, at Oroville, the average precipitation ranges from none in July and August to 4.1 inches in February. Much of the precipitation in the headwaters of the basin comes in the form of snow during November through March. Much of the snowpack melts by April at mid-range elevations (3,000–5,000 feet) (Federal Energy Regulatory Commission, 2006).

The Feather River, downstream of Oroville Dam to its confluence with the Sacramento River, is identified on the current U.S. Environmental Protection Agency (EPA)-approved (2006) CVRWQCB Section 303(d) list of waters as being impaired by sources of mercury, chlorpyrifos, certain agricultural pesticides, and toxicity of unknown origin (Regional Board 303(d) list). The North Fork Feather River below Lake Almanor is proposed for listing due to temperature and mercury under 303(d). Total Maximum Daily Loads (TMDLs) are proposed to be completed for this section of the Feather River as early as 2019 (State Water Resources Control Board, n.d.).

In general, waters in the FERC project area meet applicable water quality standards for temperature, dissolved oxygen, nutrients, pH, metals, and other pollutants in the majority of samples DWR collected as part of the relicensing effort. In the few instances in which Basin Plan objectives were not met, exceedances can be attributed to non-project sources (e.g., natural conditions and runoff from roads and parking areas) and are not related to project operations (Federal Energy Regulatory Commission, 2006).

Emergency Work Authorizations:

Following the Oroville Emergency, DWR received authorization for the emergency sediment and debris removal activities within the TDP. (See Section 8.3.4 for Permit Authorizations through the USACE and CVRWQCB). The RGP-8 authorization requires DWR to comply with the general terms and conditions of the Regional General Permit and Special Conditions, as follows:

RGP-8 Special Conditions:

1. If DWR discovers any previously unknown historic or archaeological remains while accomplishing the activity authorized by this permit, DWR shall immediately notify the Corps of what was found. The Corps will initiate the federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
2. DWR shall notify the Corps of the completion dates for each phase of the authorized work within 10 calendar days following completion of construction activities.
3. DWR shall adhere to all terms, conditions, and requirements of the Regional Water Quality Control Board's Technical Certification conditions.
4. DWR shall adhere to all terms, conditions, and requirements of the Department of Water Resources contaminant spoils plan involving the transportation and placement of spoils pile within the project area.
5. DWR shall adhere to all terms and conditions of National Marine Fisheries Service Oroville Spillway Dredging Recommendations; in particular, recommendation numbers 5, 7, and 9 (NMFS, 2017).

The NMFS Oroville Spillway Dredging Recommendations 5, 7 and 9 are (from the February 24, 2017 NMFS recommendations letter):

5. Address water supply issues (quantity and quality) at the FRFH and Thermalito Annex. Ensure adequate water is available to these facilities and that the turbidity, oxygen, and pH stay below levels that will stress fish.

7. Monitor water quality, turbidity, DO, pH and adjust dredging operations if these parameters reach levels that may adversely affect fish at the fish barrier dam or in the hatchery.
9. If possible, install turbidity curtains or booms to reduce potential turbidity levels to the maximum extent possible.

7.13.2 Environmental Effects

Thermalito Diversion Pool

The Oroville Spillways Emergency substantially altered the geometry and operational flow regime, both within the TDP and the Lower Feather River downstream from the Thermalito Diversion Dam. In the TDP, sediment eroded from the Emergency Spillway (ES) during the first-ever use of this Project feature. In order to reduce the risk to public safety and catastrophic dam failure, the Lake Oroville surface elevation was lowered below the ES crest, through the use of the damaged FCO spillway. The FCO spillway structure suffered substantial loss of concrete and surrounding soils due to its extended use.

Approximately 2.2 million cubic yards of eroded debris entered the TDP, blocking the release of water from the Hyatt tailrace downstream. Water elevations in the Hyatt tailrace rose over 20 feet, leading to concerns of extensive damage to the Hyatt Power Plant. During this period, the Hyatt Power plant was unable to operate and help pass flows out of Lake Oroville and into the TDP. The River Valve Outlet System was also inoperable, therefore the only two ways to continue releasing water was via the FCO Spillway and eventually the Emergency Spillway, until water levels in the Lake went down and debris removal operations could make headway.

The debris field (fill) contributed to temporary impacts to ~80 acres and ~6,000 linear feet of aquatic resources (i.e. Waters of the US) within the TDP.

The Central Valley RWQCB Water Quality Certification (WQC) required water quality monitoring for turbidity, dissolved oxygen, and pH. Figure 7.13-1 provides locations of the discrete monitoring stations. However, the requirements for turbidity under the WQC were deemed infeasible for this project given the temporal nature of the effects and emergency actions that needed to be completed prior to the start of the rainy season (i.e., November 1, 2017). In addition, this work was initiated to alleviate a public safety emergency resulting from high flood flows that damaged the FCO spillway and the emergency spillway at Oroville Dam. Temporary impacts related to elevated levels of turbidity may have contributed to water quality impacts within the TDP, downstream water quality concerns at the FRFH as well as downstream in the Lower Feather River. Bi-weekly reports are available through the CVRWQCB.

The initial set of emergency water quality monitoring stations that were established to meet the conditions of CVRWQCB's Technical Certification Conditions were first monitored on February 17, 2017. Physical parameters, as well as samples of total suspended solids (TSS) and settleable solids (SS) were collected three times each day. Monitoring results were analyzed and reported to the CVRWQCB every two weeks through August 18, 2017 using two-week averages of turbidity for each monitoring station; the reported turbidity results are presented in Table 7.13-1. As shown in Table 7.13-1, turbidity levels were highest during February and March 2017, and began dropping substantially thereafter.

Feather River Fish Hatchery

DWR in conjunction with CDFW and various local, State and federal agencies have monitored the water quality at the FRFH to improve the health of fry and eggs at the facility. For more information, see section 7.7.10.

7.13.3 Agency Coordination, Public Outreach, Permits

DWR worked with both federal and State regulatory staff to address impacts to Waters of the US and endangered species to ensure appropriate management actions were taken.

DWR has and continues to work directly with:

- California Department of Fish and Wildlife
- National Marine Fisheries Service
- United States Army Corps of Engineers
- Federal Energy Regulatory Commission
- California Office of Emergency Services
- Central Valley Regional Water Quality Control Board
- Cal Fire
- California Water Service
- City of Oroville
- Various local agencies and regional efforts to address water quality

7.13.4 Best management Practices

DWR staff prepared the *DWR Water Quality Monitoring Plan-Oroville Spillway Emergency-February 2017* (CA Department of Water Resources, 2017) (See Appendix E) to ensure compliance with the monitoring requirements from the CVRWQCB *Technical Certification*. DWR staff conducted discrete water quality measurements at five fixed locations in the Diversion Pool and one baseline station in Lake Oroville beginning on February 14, 2017. The primary constituents of concern from dredging

activities are turbidity, TSS, and SS. Discrete readings for dissolved oxygen, water temperature, specific conductance, and pH were also taken at each site to assess if there were any impacts to these constituent levels.

In coordination with the CVRWQCB, DWR shifted to the addition of continuous monitoring stations in the TDP, Power/Diversion Canal, Fish Barrier Pool and Lake Oroville to provide a more comprehensive data set, save staff time, and mitigate potential field safety hazards. DWR also updated the *Water Quality Sampling Plan for Thermalito Diversion Pool and the Two Outfall Canals below the Thermalito Diversion Dam* in August 2017, to Version 8.0.

Table 7.13-1. Reported Thermalito Diversion Pool Turbidity Results

Reporting Period	Bidwell Canyon		WQ #5 *		WQ #1		WQ #2		WQ #3		WQ #4		WQ #6		WQ #7					
	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max				
February 14 - February 26	20.7 NTU	37.8 NTU			38.6 NTU	58.4 NTU	36.8 NTU	48.6 NTU	36.2 NTU	49.1 NTU	39.3 NTU	61.4 NTU	Sampling of these stations initiated on June 15, 2017							
February 27 - March 12**	18.1 NTU	38.4 NTU	136.6 NTU	963 NTU	62.5 NTU	269 NTU	67.3 NTU	135 NTU	55.9 NTU	114 NTU	40.8 NTU	81.5 NTU								
March 13 - March 26	16.9 NTU	34.9 NTU	29.7 NTU	125 NTU	34.2 NTU	131 NTU	37.8 NTU	117 NTU	44.9 NTU	217 NTU	37.4 NTU	152 NTU								
March 27 - April 9	10.0 NTU	22.4 NTU	15.4 NTU	38.5 NTU	20.9 NTU	40.0 NTU	21.6 NTU	48.9 NTU	23.6 NTU	36.5 NTU	19.4 NTU	32.0 NTU								
April 10 - April 24	5.9 NTU	7.5 NTU	9.8 NTU	15.0 NTU	12.7 NTU	20.6 NTU	14.7 NTU	24.5 NTU	21.4 NTU	55.1 NTU	14.8 NTU	40.6 NTU								
April 25 - May 8	3.8 NTU	5.2 NTU	6.5 NTU	11.4 NTU	8.8 NTU	25.5 NTU	9.9 NTU	28.5 NTU	12.1 NTU	21.9 NTU	9.4 NTU	26.2 NTU								
May 9 - May 21	5.8 NTU	12.1 NTU	6.1 NTU	19.3 NTU	5.8 NTU	14.1 NTU	6.9 NTU	19.6 NTU	8.2 NTU	23.3 NTU	7.5 NTU	32.8 NTU								
May 22 - June 5	5.4 NTU	12.1 NTU	6.1 NTU	6.7 NTU	5.7 NTU	17.6 NTU	6.0 NTU	9.7 NTU	8.5 NTU	23.1 NTU	4.6 NTU	7.4 NTU								
June 6 - June 18	7.5 NTU	13.3 NTU	3.1 NTU	4.7 NTU	4.3 NTU	7.3 NTU	5.1 NTU	12.5 NTU	8.1 NTU	15.6 NTU	3.8 NTU	4.6 NTU					4.0 NTU	4.5 NTU	4.3 NTU	6.0 NTU
June 19 - July 4	5.6 NTU	14.5 NTU	3.0 NTU	6.6 NTU	4.6 NTU	10.5 NTU	4.6 NTU	6.9 NTU	6.3 NTU	18.6 NTU	3.6 NTU	5.6 NTU					3.9 NTU	5.6 NTU	4.3 NTU	6.4 NTU
July 5 - July 18	7.6 NTU	18.3 NTU	2.5 NTU	3.9 NTU	5.8 NTU	11.5 NTU	5.0 NTU	9.7 NTU	7.2 NTU	20.1 NTU	3.3 NTU	6.2 NTU	3.5 NTU	6.6 NTU	3.8 NTU	4.7 NTU				
July 19 - July 30	8.1 NTU	17.3 NTU	3.1 NTU	4.6 NTU	5.7 NTU	9.3 NTU	5.4 NTU	15.2 NTU	8.7 NTU	23.7 NTU	4.4 NTU	8.5 NTU	4.4 NTU	6.5 NTU	4.7 NTU	5.8 NTU				
July 31 - August 18	6.2 NTU	18.7 NTU	6.5 NTU	22.3 NTU	5.3 NTU	9.6 NTU	4.9 NTU	8.6 NTU	7.1 NTU	16.6 NTU	4.1 NTU	6.0 NTU	4.4 NTU	7.9 NTU	4.8 NTU	6.9 NTU				

* WQ #5 Discrete sampling initiated on March 1, 2017

** First period included in two-week WQ reports to CVRWQCB

7.14 Noise

This Section describes the existing noise environment in the project area, potential impacts and mitigation measures that have been put in place to minimize noise and vibration impacts.

7.14.1 Affected Environment

The Oroville Spillways Emergency project area is in the eastern half of Butte County in the foothills of the Sierra Nevada Mountains. This part of the county is largely

undeveloped and retains much of its natural character, with scattered rural residences and small communities located throughout the area. Vegetation cover in the foothills areas includes chaparral, oak woodland, and mixed coniferous forest. (Federal Energy Regulatory Commission, 2006)

In this semi-rural, recreational setting, ambient noise sources typically include wildlife, recreational vehicles, boats, recreational enthusiasts on the various trails throughout the area, energized powerlines, vacation traffic, and camping site noises that may include generators and human interactions. Occasional releases over the FCO Gated Spillway during the rainy season may supplement this ambient noise.

The closest residential community to the project area is located on Kelly Ridge, serving a population of 2,713 (as of 2015 census) people. This community lies at an elevation just above 1000 feet above mean sea level on the ridge between the Oroville Dam and Bidwell Canyon. (See Figure 7.14-1 map)

Since the initial response activities, much of the construction activity has and continues to be situated on the hillsides adjacent to the Emergency and FCO Gated spillways. Installation of the 230 kV Powerlines extended work areas to the south side of the TDP, opposite the Emergency and FCO Gated spillways. The Powerlines activities have, for the most part, subsided, except for post-project site stabilization activities. Heavy equipment, gravel crushing, blasting, and general construction activities continue in the spillways area 24 hours a day.

7.14.2 Environmental Effects

Construction activities have the potential to result in localized, short-term noise impacts from construction equipment. Activities in and around the FCO and Emergency spillways, as mentioned, are on-going and work has continued around the clock in order to not only meet the November 1, 2017 storm season deadline, but to also meet completion deadlines for the Emergency Spillway secant and cut-off wall and to prepare for spring FCO Spillway activities. Residences along Kelly Ridge are situated more than a mile southeast of the FCO Spillway. The distance from the construction activities, the natural noise buffer provided by the intervening Feather River canyon, and naturally vegetated hillsides reduces the potential for noise to impact these residences.

During the Response phase, however, the upper parking lot was used for staging and hovering helicopters that positioned themselves to receive erosion control materials. This type of activity occurred for a short period of time and may have potentially impacted residents, especially those directly neighboring the parking area.

Helicopters have been used throughout the Powerlines tower construction and stringing processes, as well. These activities occurred during the day and during the week when

residents were least likely to be home or least likely to be engaging in activities requiring quiet (i.e. sleeping). In addition, these flights were lower in the canyon and would have been incrementally buffered by decreases in elevation, the hillsides, and natural vegetation, thereby reducing potential noise impacts to the Kelly Ridge residents.

Vehicular traffic continues along various city, county and residential roadways. These vehicles do operate both during the day, when added noise is less disruptive and at night where noise and potential vibrations due to larger vehicles may have been and may continue to be an issue along the various haul routes to and from the spillway for delivery of materials, equipment and labor.

7.14.3 Mitigation Measures

Measures have been put into place to minimize noise and vibration impacts throughout the life of the project; they include (Kiewit Corporation, 2017):

- 1) Regularly performing preventive maintenance on equipment and devices to control, prevent and minimize noise.
- 2) Construction noise levels in the Project vicinity will fluctuate depending on the particular type and duration of usage for the various pieces of equipment. If deemed necessary, equipment (fixed or mobile), will be equipped with properly operating and maintained exhaust and intake mufflers, consistent with manufacturer's standards.
- 3) Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction will be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on compressed air exhaust will be used. External noise-reducing jackets on the tools themselves will be used where feasible.
- 4) Quieter procedures, such as use of drills rather than impact tools, will be used whenever feasible.
- 5) Construction equipment will not be idled for extended periods of time (e.g., 5 minutes or longer).
- 6) During blasting operations, crushed stone will be placed in the unloaded collar area of blast holes for the purpose of confining explosive charges and limiting rock movement and air-overpressure, thus decreasing the noise impact.

- 7) Clearing of trees will be limited to daytime hours only.
- 8) The use of jake brakes at night time will be reduced, as much as feasible, and vehicular speeds will decrease to prevent excessive braking during the evening hours.

7.15 Recreation

This section describes the recreational opportunities offered within the Lake Oroville State Recreation Area, and the potential effects that the Spillway Recovery and Response actions have had on various recreational facilities. Because it is still not known when some of the affected facilities will reopen, DWR is working to improve and expand on some existing facilities around Lake Oroville to help mitigate effects to these facilities.

7.15.1 Affected Environment

Recreation facilities at Lake Oroville offer a wide variety of recreational opportunities. Camping experiences in the area range from fully developed campgrounds to primitive, less-developed sites; boat-in and unique floating campsites also exist. There are two full-service marinas, five main boat ramps, five car-top boat ramps, 10 floating campsites, seven floating restrooms, and a visitor center located around Lake Oroville. There are developed recreation facilities at Loafer Creek, Bidwell Canyon, Spillway, and Lime Saddle. In addition to camping, other recreation opportunities include picnicking, swimming, horseback riding, hiking, off-road bicycle riding, fishing, wildlife watching, photography, boating, and hunting. The area also offers visitor information sites with cultural and informational displays about project facilities and the area's natural environment. Additional recreational and visitor facilities are located at Thermalito Forebay, Diversion Pool, Thermalito Afterbay, and the OWA.

The recreation facilities most impacted by the Spillway incident are located near Oroville Dam and around the Diversion Pool. High flows led to additional recreation impacts further downstream along the Feather River but were due to the high flow event, not the Spillway failure and are not discussed in this section.

See Appendix B, Figure 7.15-1 and 7.15-2 for Recreation Facilities Impacted by Spillway Incident.

7.15.1.1 Spillway Recreation Area

The largest set of recreation facilities impacted by the incident is the Spillway Recreation Area. The Spillway Boat Ramp and Day Use Area (DUA) is the largest boat

ramp facility at Lake Oroville, and is located adjacent to the right abutment of Oroville Dam. Development here consists of two stages of multi-lane boat ramps. One stage of ramps has eight lanes and can be used during low to medium water levels, while the other has 12 lanes and can be used during medium to high water. The eight-lane ramp is separate from the 12-lane ramp, and each has its own accompanying parking lot. During high water, the lower eight-lane ramp and its asphalt parking lot are submerged. The lower eight-lane boat ramp was extended down to 695 feet msl in January 2003.

The site has a seasonally staffed visitor information and fee collection booth. The site has six flush toilets (two ADA accessible), drinking water, a fish cleaning station, and picnic sites (six tables) with shade trees and sun shelters. The upper lot has 350 vehicle/trailer parking spaces, 40 of which have been set aside for “en route” (self-contained) RV camping. The main ramp has spaces for a maximum of 75 vehicles/trailers available at medium and low pool levels. There are 118 single-vehicle parking spaces (eight ADA accessible) in the upper lot. The shoreline access allows for fishing at all reservoir levels. Two trailheads are also at this site. See Appendix A, Figure 7.15-3.

7.15.1.2 Oroville Dam Overlook Day Use Areas

Located on the southwest shoreline of the reservoir, the crest of Oroville Dam is used for driving and sightseeing, walking, jogging, bicycling, and rollerblading. Some fishing takes place at the edge and can be undertaken at any reservoir level. Oroville Dam is the tallest earthfill dam in the nation with a height of 770 feet. At night, lights accent the 6,920-foot-long roadway along the dam’s crest.

The Oroville Dam Overlook DUAs are located on the east and west ends of the dam, all of which are east of the Spillway Recreation Area. There are picnic tables on the east and west ends. There are four flush toilets (one ADA accessible) at the east end of the dam. There is a drinking fountain. There are approximately 400 parking spaces across the top of the dam (two are ADA accessible), but parking here has not been allowed since heightened security was implemented following the September 2001 terrorist attacks. Parking (approximately 20 vehicle spaces) remains open at the east end of the dam. Additionally, the DUA facilities at the western end of the dam are only open when the water is below the sill of the Spillway gates for security reasons; appropriateness of use of this area under certain water conditions may be reviewed in the future.

The Upper Overlook is a relatively newer DUA and is located above the restrooms on the east side of Canyon Drive. There’s an interpretive display, bench seating, picnic tables, a shade structure, and parking for approximately 20 vehicles. The DUAs also double as trailheads to the Brad Freeman, Dan Beebe, and Kelly Ridge trails. See Appendix A, Figure 7.15-4

7.15.1.3 Diversion Pool Day Use Area

The Diversion Pool and its shoreline, located below Oroville Dam and above Thermalito Diversion Dam, are usually open for day use activities such as, fishing, non-motorized boating, trail use, and picnicking. The current Diversion Pool DUA (north) is located along Burma Road, which runs on the north and west sides of the Diversion Pool. Only non-motorized boats and boats with electric motors are allowed on the Diversion Pool. The only developed facility at this area is a vault toilet building; also, one small shoreline access point has been enhanced with gravel to facilitate car-top boat launching. Burma Road is also a trail corridor/trailhead for the Brad Freeman Trail. See Appendix A, Figure 7.15-5.

7.15.1.4 Designated Trailheads

- Potter's Ravine and Potter's Point - Access to the Potter's Ravine and Potter's Point trails comes from the Spillway Recreation Area.
- Powerhouse Road - The Powerhouse Road Trailhead is south of Hyatt Powerplant and accesses the Brad Freeman Trail along the south shoreline of the Diversion Pool.
- Burma Road - Burma Road runs along the north shoreline of the Diversion Pool and acts as another trailhead for the Brad Freeman Trail.
- Lakeland Blvd - Lakeland Blvd Trailhead is located east of the Thermalito Diversion Dam and provides access to the Brad Freeman and Dan Beebe Trails.

(See Figure 7.15-2 map)

7.15.2 Environmental Effects

The use of the Emergency Spillway in February washed out the road used to access the Spillway Recreation Area. Since then the parking lot is being used as a command center for the emergency response. The Spillway Recreation Area is expected to remain closed to the public for at least 2 years.

The Overlook Day Use Areas have remained closed and the adjacent parking lots are being used as construction/staging areas. Burma Road, sections of the Dan Beebe and Brad Freeman trails, and the entire Diversion Pool are also closed to the public.

Closure of the Spillway Recreation Area also led to the closure of several miles of trails. Figure 7.15-2 depicts most of the trail closures, however the map does not show the Potter's Ravine trail as being closed, but there is no current way for the public to access that trail. According to the California Department of Parks and Recreation, prior to the incident, bike users had about 37.3 miles of trails within the Lake Oroville State

Recreation Area. Now they only have access to about 5.5 miles of usable trails, an 86% reduction. Equestrians have access to additional trails throughout Loafer Creek and have not been impacted as heavily as the bicyclists.

Some of the recreation facilities that were not directly affected or closed as a result of the Spillway, have been impacted in that their use has seen an increase in visitation. Recreation Areas like Bidwell Canyon, Loafer Creek, and Lime Saddle reached (or were close to reaching) maximum capacity over Memorial Day and Independence Day weekends in 2017. Some of the directly affected or closed as a result of (or were close to reaching) maximum in 2017.

7.15.3 Mitigation

It is unknown at this point when the closed facilities will be reopened to the public. Because of that, DWR is in the process of improving and expanding several recreation facilities to offset some of the lost recreation. Some of DWR's improvement efforts include early implementation of projects that are anticipated to be included in the pending renewal of the P-2100 license. Implementing these recreation improvements prior to issuance of a new license is providing benefits to the community by allowing recreationists to enjoy them sooner than they otherwise would. FERC has approved all proposed improvements, except for Loafer Creek Stage 1 which is currently (as of Jan. 2018) undergoing FERC review. These improvements are as follows (See Appendix B, Figure 7.15-6 for locations of proposed mitigation sites and Appendix A, Table 7.15-1 for more detail):

- **Additional Parking at Lake: 580+ spaces**
 - Lime Saddle = up to 60 vehicle/trailer spaces
 - Bidwell Canyon Marina = up to 55 vehicle/trailer and up to 55 single spaces
 - Enterprise Stage 2 (new facility) = up to 40 vehicle/trailer spaces
 - Bidwell Canyon Stage 2 Parking = up to 30 vehicle/trailer spaces
 - Loafer Creek Stage 2 (new facility) = up to 200 vehicle/trailer spaces
 - Loafer Creek BR Parking Lot = up to 40 gravel vehicle/trailer spaces (minor modification to existing facility; prior FERC approval not needed)
 - Loafer Creek Stage 1 Parking (new facility) = up to 100 vehicle/trailer spaces

- **Additional Boat Ramp Lanes: 15**
 - Bidwell Canyon Stage 1 = up to 2 lanes
 - Bidwell Canyon Stage 2 = up to 2 lanes
 - Loafer Creek Stage 2 (new facility) = up to 8 lanes
 - Loafer Creek Stage 1 (new facility) = up to 3 lanes
- **Boat Ramp Lane Extension: 2** (existing lanes will be extended at Enterprise)
- **Increased Efficiency at Boat Ramps** (shuttles)
- **Improved Trailhead** (Bidwell Saddle Dam Trailhead Access)
- **Improved Marina Access at low lake levels** (Bidwell Canyon and Lime Saddle)

7.15.4 Agency Coordination, Public Involvement, and Permits

- Agencies and stakeholders include but are not limited to: The California Department of Parks and Recreation, Air Quality Management District, USACE, CDFW, Local Tribes, Oroville Recreation Advisory Committee, Butte County Department of Environmental Health, Lake Oroville Area Public Utility District, and the Water Board.
- Six of the proposed 10 recreation improvement projects occur within Waters of the US and need an Army Corps permit, as well as a DFW permit.
- The projects occurring at Bidwell Canyon, Bidwell Saddle Dam, Loafer Creek, and Enterprise require cut material that requires air quality monitoring.
- All of the proposed projects have storm water and sediment/erosion control requirements as well as archeological and cultural survey requirements.
- Oroville Recreation Advisory Committee generally holds meetings twice per year, but has been holding meetings monthly since May 2017. DWR participates in these meetings to provide updates on the proposed recreation improvements, receive feedback, and hears requests for additional recreation related matters.

- DWR has also been trying to keep the public informed (via press release) prior to construction of new facilities so they can be aware of the projects and plan accordingly.

7.16 Transportation

This section describes the transportation systems in the project area that are affected by the Oroville Spillway Emergency Response and Recovery actions. It includes descriptions of local roads and State Highways in the vicinity of the project and potential impacts from the Oroville Spillway Emergency event and response and recovery actions.

7.16.1 Affected Environment

The project area is located in a generally rural area, which is served by a roadway network of State Routes and County and local roads. Two major highways, State Routes (SR) 70 and 162 provide regional transportation access to the project area. The project area is accessed by various County roads and City of Oroville streets, and access to individual areas within the Oroville Facilities is provided by DWR-maintained site roads.

7.16.2 Environmental Effects

During the initial response to the Oroville Spillway emergency, DWR directed its contractors, under emergency contract, to mobilize all available equipment and stabilizing material to project area. Due to the urgency of the response, the quickest routes available were used to get the trucks, equipment, and material to where they were needed.

DWR's sudden response to the Oroville Spillway emergency occurred before a baseline condition road assessment could be performed; however, upon recognizing the potential impact that the response and recovery efforts would have on the local roadways, DWR contracted the services of a professional geotechnical and survey company to perform two separate inspections and technical analyses on all roadways that may have sustained damage or excessive wear as a direct result of DWR's response efforts. The first survey was conducted on March 2, 2017 to identify all damage existing on the roadways used by DWR and its contractors during the response, and a follow up survey was performed on June 20, 2017 to measure the rate of any damage occurring on these roadways. DWR engineers reviewed these findings and determined the appropriate repairs and associated costs that should be made to these roadways. The City and County provided very few maintenance records or initial

build standards for their existing roads. Therefore, the damages determined to be caused by DWR's response efforts were identified by means of an after-the-fact analysis conducted by subject matter experts.

The following list contains public roads, which are maintained by local government entities, and which were likely damaged by DWR's emergency response and subsequent recovery efforts (See Appendix B, Figure 7.16-1 for those public roads potentially impacted by emergency project activities). A list of these roads is provided below:

County-Owned and -Maintained Roads

- Canyon Drive
- Royal Oaks Drive
- Glen Drive
- Kelly Ridge Road
- Miners Ranch Road
- Oro-Bangor Highway
- La Porte Road
- Cherokee Road
- Oregon Gulch Road
- Oro-Dam Blvd. East
- Los Verjeles Road
- Oroville Quincy Highway
- Durham Pentz Road
- Pentz Road
- East Gridley Road
- Table Mountain Blvd
- Derrick Road

City Owned and Maintained Roads

- Table Mountain Boulevard
- La Palma Drive
- La Crescenta Drive
- La Paz Drive
- Cherokee Road
- Nelson Avenue
- Grand Avenue
- Oro Dam Boulevard (East) at Glen Drive
- Montgomery Street

State-Owned and Maintained Roads

- State Route 162 (Caltrans)

Typical road damage caused by DWR's response efforts ranged anywhere from the development of minor rutting (a deformation along the road surface), to potholes and alligator cracking (the final breakdown of the upper wear surface, indicating a failure in the integrity of the road).

In total, 27 roadways, including a state highway (SR 162) and several local primary thoroughfares and secondary arterials, sustained damage due to DWR's response efforts. Canyon Drive sustained extensive damage and required immediate full reconstruction for continued project use. Cherokee Road sustained extensive pothole and alligator cracking and was also repaired for continued project use, and Butte County installed steel plates along portions of Glen Drive and repaired severe rutting and potholing. Again, Appendix A Tables 7.16-1 and 7.16-2 summarize the extent of damage that was determined to be caused by DWR as a result of the Oroville Spillway Emergency Response Actions.

7.16.3 Mitigation

DWR has required its contractors to develop and adhere to a Temporary Traffic Control Plan (See 17-09 spec. Appendix C) and designated haul route (See 17-09 spec. and Appendix B, Figure 7.16-2) to identify roadways that are best suited for the anticipated construction traffic, and to ensure that best practices for traffic and safety control are

implemented along the entirety of the haul route. Special considerations were made during the establishment of the haul route to eliminate traffic along residential streets where possible. Throughout the project, DWR, with the help of local and state law enforcement, have monitored the hauling activities along the designated haul route to confirm all drivers are operating in a safe and cautious manner, especially during night time work shifts.

To further ensure public safety during construction, DWR also made the decision to close a portion of Oro Dam Blvd. from Rusty Dusty Rd. to the Canyon Drive Intersection. Closing the road increases construction efficiency and minimizes impacts to construction crews and residents which is safer for both construction workers and the public.

While DWR has taken significant steps to minimize the damage caused to the local roadways, both the City and County are seeking reimbursement from the Federal Emergency Management Agency (FEMA) to repair the total extent of the damage caused by the response efforts. To facilitate a more expedient repair of the damaged roads, DWR is in the process of entering into several road damage agreements with the County and City to advance the repair costs for damages caused by DWR's response to the emergency.

Response damage to these haul route roads will be covered through DWR construction contracts. The following roadways were identified as Haul Route Roads to be used during the construction process:

Haul Route Roads

- Canyon Drive
- Garden Drive
- Table Mountain Boulevard
- Nelson Avenue
- Third Avenue
- Grand Avenue
- Cherokee Road
- Oro Dam Boulevard East
- State Route 162

To further ensure public safety during construction, DWR also made the decision to close a portion of Oro Dam Blvd. from Rusty Dusty Rd. to the Canyon Drive Intersection. Closing the road increases construction efficiency and minimizes impacts to construction crews and residents which is safer for both construction workers and the public.

7.16.4 Agency Coordination, Public Involvement, and Permits

Execute Roadway Damage Agreements:

To ensure neither the City nor the County undergoes financial hardship as a result of DWR's Response or Recovery efforts, all administration, engineering, and road repair costs, resulting from damage caused by DWR's Response and Recovery efforts, will be reimbursed to the City/County by DWR through executed roadway damage agreements.

DWR and the City/County will come to mutual agreement with regard to which roads will be repaired and the types of repairs to be made in order to ensure all DWR reimbursements are reasonable, necessary, and justifiable.

As a provision of the damage agreements, DWR will not reimburse the City or County for repairs made to roads where a FEMA claim has not been submitted and a FEMA inspection has not been scheduled.

The agreements between DWR and the City and County will provide a mechanism to compensate those local entities for the initial damage to roadways caused by DWR's response activities. The Road Damage Agreements will address the cost to facilitate repairs along any "non-haul route" roadways. Repairs to damage caused by DWR's contractors along the haul route roads will be made by DWR's contractors as a part of DWR's overall construction efforts. As a provision of the agreements, any duplicate compensation made to the City and County from FEMA will be returned to DWR.

Further, DWR will offer guidance to the City and County in the FEMA and Federal Highway Administration (FHWA) reimbursement application process.

Agency Coordination and Public Involvement:

Relating to transportation and the impact to the local roadways, DWR has hosted or actively participated in the following:

- **Community Outreach Meetings:** these DWR-hosted forums were developed to address public concerns and answer questions. These gatherings were held in Oroville, as well as the surrounding communities of Marysville, Yuba City, Chico, and Sacramento.

- Stakeholders Meetings: these DWR-organized events served as a means to coordinate with all of the local agencies involved in the recovery efforts. Representatives from DWR (Headquarters), DWR (Field Division), California State Parks, Butte County, California Highway Patrol, Butte County Sherriff's Department, CalFire, Butte County Fire, and the City of Oroville participated in these meetings. The intent was for DWR to provide traffic control plan details, specific haul route information as well as to coordinate with the local public agencies and law enforcement on any issues that arise.
- Oroville City Council Meetings: DWR attended these meetings to answer questions and provide information about local transportation related issues.
- Butte County Board of Supervisors Meetings: DWR attended these meetings to answer questions and provide information about local transportation related issues.

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Attachment 3

Bender Rosenthal Inc. Appraisal

APPRAISAL REPORT



Northwest Quadrant of Oro Dam Boulevard East
and Rusty Dusty Road
Butte County, California 95966
APNs: 033-010-055 and 069-010-019

Date of Value: January 25, 2018

Date of Report: February 9, 2018

BRI 17-267

BRI **BENDER
ROSENTHAL
INCORPORATED**

2825 Watt Avenue, Suite 200 Sacramento, California 95821 | www.benderrosenthal.com | 916.978.4900

February 9, 2018

Mr. Linus A. Paulus, SR/WA
Chief, Acquisition and Appraisal Section
Department of Water Resources
Division of Engineering
Real Estate Branch
1416 Ninth Street, Suite 425
Sacramento, California 94236

Re: Appraisal of the PG&E Property
Oroville Spillway Emergency Recovery Transmission Line Relocation Project
Northeast Quadrant of Oro Dam Boulevard East and Rusty Dusty Road
Butte County, California 95966

Dear Mr. Paulus:

We have completed the appraisal of the above-referenced property that will be affected by the Oroville Spillway Emergency Recovery Transmission Line Relocation Project. The State of California, Department of Water Resources (DWR) is acquiring three permanent easements in support of the Oroville Spillway Emergency Recovery – Oroville to Table Mountain 230kV Transmission Line Relocation Project. The project includes the installation of nine 230kV transmission towers, which are required for the operation of the Hyatt Power Plant, as well as the installation of a new fiber optic cable.

Specifically, DWR is proposing to acquire a 25.54-acre permanent tower line easement for the installation and operation of nine 230kV transmission towers. It is noted that as of the date of inspection these facilities have already been installed on the property. According to the DWR representative, the transmission tower facilities were installed in September of 2017. Additionally, DWR is proposing to acquire a 0.22-acre permanent underground cable easement for new fiber optic cables that have yet to be installed. Furthermore, DWR requires another 0.07-acre permanent underground cable easement for an existing fiber optic cable that was installed previously in the 1990's.

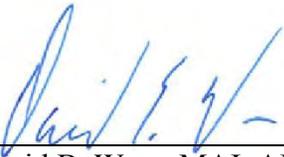
The affected subject property consists of two parcels, owned by PG&E and zoned public, which are located in Butte County along Oro Dam Boulevard East, northeast of the City of Oroville and proximate to the Oroville Dam. Combined the two parcels total 236.42 acres and are situated on a hillside with significantly sloping topography and appears to be adequately drained. Other than the existing PG&E transmission tower line facilities and DWR's transmission tower line facilities (which is the purpose of one of the proposed easements), the subject is vacant land that is densely wooded. Oro Dam Boulevard East bisects the subject property and surrounding the two affected subject parcels are numerous public zoned properties owned by PG&E and DWR as well as the

Feather River, Oroville Dam and Lake Oroville. A more detailed description of the subject property will be discussed later in this report.

The following appraisal report contains the scope of the assignment, required investigation, data and analyses upon which an opinion of fair market value is based. This is an appraisal report as defined by USPAP. The appraisal is subject to the hypothetical condition, extraordinary assumptions, general assumptions and limiting conditions and certification included in the report. We have prepared this report of our appraisal in conformance with and subject to the requirements of the Code of Professional Ethics and the Standards of Professional Practice of the Appraisal Institute, which fully incorporate the Uniform Standards of Professional Appraisal Practice (USPAP) of the Appraisal Foundation.¹ In addition, we have intended to comply with all applicable state laws.

We are pleased to have this opportunity to provide you with professional appraisal services.

BENDER ROSENTHAL, INC.



David B. Wraa, MAI, ARA, AI-GRS
Certified General Real Estate Appraiser
California Certificate No. AG023713



Kelli N. Johnson
Certified General Real Estate Appraiser
California Certificate No. AG043915

¹ The Appraisal Institute is a national organization of appraisers that self-regulates its members, and the undersigned are designated Members of the Appraisal Institute (MAI). A Member must adhere to the Institute's ethics code and standards. The U.S. Congress has tasked the Appraisal Foundation to set standards and procedures with which state-certified appraisers must comply when appraising property interests involved in federally-regulated transactions.

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PROPERTY IDENTIFICATION AND SUMMARY OF SALIENT FACTS

Appraisal Assignment: To estimate the fair market value of the permanent easement acquisitions.

Property Location: Northeast Quadrant of Oro Dam Boulevard East and Rusty Dusty Road in Butte County
California 95966

PROPERTY DATA

Legal Description: The Butte County parcel maps were used in the identification of the property. A legal description is located in the preliminary title report which can be found in the addenda to this report.

APNs: 033-010-055 and 069-010-019

Owner of Record: Pacific Gas and Electric Company, a California Corporation (as per the preliminary title report provided by Fidelity National Title Company, dated March 8, 2017).

Larger Parcel Area: 236.42± acres, according to the Butte County Assessor's Parcel Maps.

Site Description: The affected subject property consists of two parcels, owned by PG&E and zoned public, which are located in Butte County along Oro Dam Boulevard East, northeast of the City of Oroville and proximate to the Oroville Dam. Combined the two parcels total 236.42 acres and are situated on a hillside with significantly sloping topography and appears to be adequately drained. Other than the existing PG&E transmission tower line facilities and DWR's transmission tower line facilities (which is the purpose of one of the proposed easements), the subject is vacant land that is densely wooded. Oro Dam Boulevard East bisects the subject property and surrounding the two affected subject parcels are numerous public zoned properties owned by PG&E and DWR as well as the Feather River, Oroville Dam and Lake Oroville.

Zoning: Public (PB)

General Plan Designation:	Public/Quasi-Public
Soils:	The subject property is composed entirely of Dunstone-Loafecreek non-irrigated soils, Class VII. The Dunstone-Loafecreek soils are broken down into three different slopes on the subject property including 12.4% at 2 to 15 percent slopes, 55.8% at 15 to 30 percent slopes and 31.8% at 30 to 50 percent slopes.
Flood Information:	Flood Zone X (unshaded)
Seismic Information:	Not located in a special seismic study area.
Toxic Hazards Information:	<p>The appraisers did not observe any unusual conditions while performing the inspection. However, Bender Rosenthal, Inc. and the representatives thereof, are not expert in this field. Please refer to Item 16 of the Assumptions and Limiting Conditions.</p> <p>Furthermore, we were directed by the client to appraise the property as though free and clear of any toxic materials.</p>
Wetlands:	No known wetlands were apparent on the subject property at the time of the inspection. The appraisers are not experts in the field of detecting wetlands. No environmental reports were provided, and we assume no wetlands exist on the property (see Extraordinary Assumption #2).
Sale History:	According to discussions with the subject owner and also a review of public records, there have been no sales, listings or offers to purchase the property within the past five years.
Current Use:	Public use for transmission tower facilities
Highest and Best Use:	As will be discussed in more detail, given the public use nature of the subject's zoning & GP, the highest and best use of public lands is for the most likely alternative use if it were not for public use. Thus, the highest and best use is for rural residential, consistent with the most likely zoning and general plan designation of Very Low Density Residential (VLDR).

**Fair Market Value of the
Proposed Acquisition:**

Permanent Easement Acquisitions	\$ 80,225
Net Severance Damages	\$ 0
Temporary Construction Easement	<u>\$ 0</u>
Total	\$ 80,225
Rounded	\$ 80,300

Date of Value: January 25, 2018

Date of Report: February 9, 2018

Exposure Period: Based upon current market conditions, discussions with market participants, and the sales data, an estimated exposure period of 6 to 12 months is considered appropriate.

I. INTRODUCTION

CLIENT, INTENDED USE, INTENDED USER OF THE APPRAISALS

The client and intended user is the Department of Water Resources (DWR). The intended use of the report is to estimate the fair market value of three permanent easement acquisitions of a portion of the property. The estimate of fair market value will be used by DWR to establish an offer of just compensation for the permanent easement acquisitions on the property for the Oroville Spillway Emergency Recovery Transmission Line Relocation Project.

SCOPE OF WORK

The appraisal assignment is to estimate the current fair market value of the portion of the subject property to be acquired for the Oroville Spillway Emergency Recovery Transmission Line Relocation Project. The date of value is based on the inspection date, unless noted otherwise in the appraisal. The date of the report is the date the appraisal is transmitted to the client.

VALUATION / RESEARCH OVERVIEW

The following is an overview of the valuation process and research involved for the subject property and comparable sales. The valuation of the property involved an investigation and analysis of the neighborhood, as well as the entire regional area, for social, economic, governmental, and environmental forces and trends that affect or could influence property values.

- The property was inspected on January 25, 2018 by Kelli Johnson, Alysia Ballantyne and Russell Layton from Bender Rosenthal, Inc. and Bradley Johnson with DWR, accompanied by the property representatives with PG&E, Heather Gresham and Laird Oelrichs. David Wraa, MAI, ARA, AI-GRS inspected the area at a later date.
- Research the area, community, and neighborhood to determine market influences/conditions.
- Research of public records to verify information about the subject property and comparable sales to ensure they are factually accurate and that there are no terms or additional influences that affect price or value.
- Research zoning and general plans obtained from Butte County Planning Department, and other department websites, and research of the rural residential market.
- Review of applicable soil surveys, flood and seismic hazard areas from appropriate source data.
- Review public records obtained from the various city and county governmental agencies including the Planning Department, Assessor's Office, and Tax Collector's Office.
- A search of specific property transfers occurring during the past five years was conducted for the subject property.

- Various meetings and discussions with representatives of State of California, Department of Water Resources.
- Determine highest and best use of the property.
- Research comparable property sales, listings, and offers to purchase or sales involving similar properties to the subject property and within the subject's market or competing market areas.
- Interview comparable property owners and/or brokers.
- Analyses of the property utilizing the Sales Comparison Approach.
- Analyses of the proposed permanent easements.
- Prepared a written report of our findings and conclusions.

Valuation Approaches. The appraisal process includes the investigation and analysis of the subject, market, and other relevant data for the purpose of providing an opinion of the defined value for the subject property. All economic forces and factors are considered in arriving at the highest and best use and valuation of the subject property.

There are typically three approaches to value that may be used in the real property valuation process. They are the Sales Comparison Approach, Income Approach, and Cost Approach. Each approach provides an indicated value that is reconciled into a final estimate of value for the subject based on the interests appraised the defined objective of the valuation and the stated definition of value. The analysis may include one, two or all three approaches to value based on the data available, the type of property and appraisal valuation problem.

Sales Comparison Approach. A value indication is derived by comparing the property being appraised to similar properties that have sold recently; making qualitative or quantitative comparisons to the subject; then applying units of comparisons to indicate a value for the larger parcel or remainder parcel. The sales comparison approach may be used to value improved properties, vacant land, or land being considered as though vacant; it is the most common and preferred method of valuation when an adequate supply of comparable sales is available. Sales, listings and current escrows of comparable sales were considered in this analysis. Primary reliance has been placed on closed sales transactions.

- Inspect potential comparable properties to determine most similar properties for comparison.
- Evaluate each comparable in comparison to the subject property to estimate the fair market value of the subject by the Sales Comparison Approach

Income Approach. A value indication is derived for income-producing property by converting its anticipated benefits (cash flows and reversion) into a value for real property interests. Typically, the annual net income is capitalized at a market-derived capitalization rate to estimate the desired value. The income approach is most often used for income producing properties or real estate acquired as an investment. The Income Approach was not utilized to value the subject as this is not a typical method to value land.

Cost Approach. A value indication is derived for a property by estimating the current cost to construct a replacement/reproduction of the existing structure(s); deducting depreciation from all sources; and adding the estimated land value. The cost approach is most often used when valuing properties with new or relatively new improvements and also special use properties. The Cost Approach was not considered to be applicable to this appraisal problem as this is not a typical method to value land.

Right of Way Appraisals. Appraisals for public acquisitions involve acquiring fee title and/or easement rights from an owner. In situations whereby a property is leased, the property is valued as if title were held by a single entity, consistent with the “unit rule” or the “undivided fee rule”. Improvements not impacted by the project have not been included in the analysis.

Partial Acquisition Interest Analysis. This analysis is applicable to this appraisal. The analysis starts with an estimate of market value for the “undivided fee” interest of the larger parcel using the most applicable method for valuing similar properties.

Once the larger parcel value is estimated the following partial acquisition appraisal methodology is utilized:

- Value the part acquired.
- Value of the remainder parcel as part of the Larger Parcel, which is the value of the remainder before consideration of damages or benefits.
- Value the remainder parcel, after the proposed acquisition and before consideration of benefits. This identifies severance damages due to the acquisition, consisting of a potential loss of market value (by comparing to value of the remainder as part of the larger parcel) and cost to cure damages are estimated where applicable.
- Value the remainder parcel, after the acquisition, considering benefits. This identifies benefits, consisting of a potential gain in market value due to the acquisition (by comparing to value of the remainder as part of the larger parcel).
- The value of the acquisition is the value of the part acquired plus net severance damages as California law allows benefits to only offset severance damages.

*Non-Compensable Damages*³. Items of severance damages are considered to include factors that are remote, speculative, uncertain, or imaginary. Some examples of non-compensable items are:

- Damages to business;
- Expenses for moving personal property;
- Temporary damage to the use and occupancy of property reasonably incident to construction requirements;
- Damages due to annoyance and inconveniences suffered by the public in general;

³ Caltrans Right of Way Manual, Section 7.09.03.00

- Circuitry of travel caused by dividing a highway;
- Re-routing or diversion of traffic or changing of a two-way street to a one-way street; and
- In general, all those types of damages that can be considered to be conjectural, speculative and remote.

DEFINITIONS USED IN THE REPORT

Fair Market Value⁴

- A) Fair market value of the property taken is the highest price on the date of valuation that would be agreed to by a seller, being willing to sell but under no particular or urgent necessity for so doing, nor obliged to sell, and a buyer, being ready, willing, and able to buy but under no particular necessity for so doing, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available.
- B) The fair market value of a property taken for which there is no relevant market is its value on the date of valuation as determined by any method of valuation that is just and equitable.

The Code goes on to say that:

The fair market value of the property taken shall not include any increase or decrease in the value of the property that is attributable to any of the following:

- A) The project for which the property is taken.
- B) The eminent domain proceeding in which the property is taken.
- C) Any preliminary actions of the plaintiff relating to the taking of the property.

Compensation for Property Taken⁵. Compensation shall be awarded for the property taken. The measure of this compensation is the fair market value of the property taken.

Larger Parcel. In governmental land acquisitions and in valuation of charitable donations of partial interests in property such as easements, the tract or tracts of land that are under the beneficial control of a single individual or entity and have the same, or an integrated, highest and best use. Elements for consideration by the appraiser in making a determination in this regard are contiguity, or proximity, as it bears on the highest and best use of the property, unity of ownership, and unity of highest and best use. In most states, unity of ownership, contiguity, and unity of use are the three conditions that establish the larger parcel for the consideration of severance damages. In federal and some state cases, however, contiguity is sometimes subordinated to unitary use.

⁴ Office of the Comptroller of the Currency. CFR Title 12, Part 34, Subpart C, § 34.42 Definitions (g)

⁵ Section 1263.310 of the Code of Civil Procedure

Damage to Remainder⁶. Damage to the remainder is the damage, if any, caused to the remainder by either or both of the following:

- A) The severance of the remainder from the part taken.
- B) The construction and use of the project for which the property is taken in the manner proposed by the plaintiff whether or not the damage is caused by a portion of the project located on the part taken.

Benefit to Remainder⁷. Benefit to the remainder is the benefit, if any, caused by the construction and use of the project for which the property is taken in the manner proposed by the plaintiff whether or not the benefit is caused by a portion of the project located on the part taken.

Offset Rule. On August 25, 1997, the California Supreme Court ended the rule that only benefits deemed "special" could be offset against severance damages in determining compensation in condemnation actions. Under its decision in the Continental Development case, all benefits, general and special can reduce an award of severance damage.

PROPERTY RIGHTS DEFINED

Fee Simple Estate⁸. Absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power, and escheat.

Easement⁹. An interest in real property that conveys use, but not ownership, of a portion of an owner's property. Access or right of way easements may be acquired by private parties or public utilities. Governments dedicate conservation, open space, and preservation easements.

⁶ Section 1263.420 of the Code of Civil Procedure

⁷ Section 1263.430 of the Code of Civil Procedure

⁸ Dictionary of Real Estate Appraisal (Fifth Edition), Appraisal Institute, Chicago, Illinois, 2010, P. 78

⁹ IBID, P. 90

GENERAL ASSUMPTIONS AND LIMITING CONDITIONS

This appraisal report and the value estimates it contains are expressly subject to the following assumptions and/or limiting conditions.

1. Title to the property is marketable.
2. No survey of the property has been made by the appraisers and property lines as they appear on the ground are assumed to be correct. *Please refer to the Extraordinary Assumptions presented later.*
3. Data, maps, and descriptive data furnished by the client or his/her representatives are accurate and correct.
4. No responsibility is assumed for matters of law or legal interpretation.
5. No conditions exist that would affect the use and value of the property, which are not discoverable through normal, diligent investigation.
6. The valuation is based on information from sources believed reliable, and that such information is correct and accurately reported.
7. The value estimate is made subject to the purpose, date, and definition of value.
8. The report is to be considered in its entirety and use of only a portion will invalidate the appraisal.
9. This appraisal was made on the premise that there are no encumbrances prohibiting utilization of the property under the appraiser's estimate of highest and best use.
10. Possession of this report or a copy does not carry with it the right of publication nor may it be used for any purpose by anyone other than the client without the previous written consent of Bender Rosenthal, Inc., and then only with proper qualifications.
11. Disclosure of the contents of this appraisal report is governed by the By-Laws and Regulations of the Appraisal Institute. No part of this narrative report may be reproduced by any means nor disseminated to the public in any way without the prior written consent of Bender Rosenthal, Inc.
12. Any person or entity who obtains or reads this report, or a copy, other than the client specified in this report, expressly assumes all risk of damages to himself or third persons arising out of reliance on this report and waives the right to bring any action based on the appraisal, and neither the appraisers nor the appraisal firm shall have any liability to any such person or entity.
13. The appraisers shall not be required to give testimony or appear in court by reason of this appraisal with reference to the property described in this report unless prior arrangements have been made.
14. No responsibility is assumed for building permits, zone changes, engineering or any other services or duty connected with legally utilizing the subject property.

15. The property appraised may or may not be subject to the Americans with Disabilities Act of 1990 (ADA). Title III of this act provides for penalties for discrimination in failing "...to remove architectural barriers...in existing facilities [unless] an entity can demonstrate that the removal... is not readily achievable..." Unless otherwise noted in this appraisal, it is assumed that the property appraised is not substantially impacted by this law.
16. Unless otherwise stated in this report, the existence of hazardous material, which may or may not be present on the property, was not observed by the appraisers. The appraisers have no knowledge of the existence of such materials on or in the property. The appraisers, however, are not qualified to detect such substances. The presence of such substances as asbestos, urea-formaldehyde foam insulation, or other potentially hazardous materials may affect the value of the property. The value estimate is predicated on the assumption that there is no such material on or in the property that would cause a loss in value. No responsibility is assumed for any such conditions, or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.
17. It is assumed that the property appraised is competently managed and marketed.

EXTRAORDINARY ASSUMPTIONS

*Note to Reader: The subject property is subject to the following extraordinary assumptions and/or hypothetical conditions, which might have affected the assignment results.*¹⁰

1. Information regarding the property appraised was provided from the client (DWR). This information included the surveyed size of the three acquisition areas. This appraisal assumes that the information provided is reasonably accurate. If the information is found to be false at a later date, the value conclusions in this appraisal report may change. Furthermore, should any of these area calculations be revised, the appraisers' value opinions could change.
2. No known wetlands were apparent on the subject property at the time of the inspection. The appraiser is not an expert in the field of detecting wetlands. No environmental reports were provided, and we assume no wetlands exist on the property that have a negative impact to the value.
3. This appraisal assumes that the proposed easement will have language similar and no more restrictive than the draft easement document provided by DWR, included within the addenda of this report.

HYPOTHETICAL CONDITIONS

*Note to Reader: The subject property is subject to the following extraordinary assumptions and/or hypothetical conditions, which might have affected the assignment results.*¹¹

1. The fair market value of the property taken shall not include any increase or decrease in the value of the property that is attributable to any of the following: 1) the project for which the property is taken; 2) the eminent domain proceeding in which the property is taken; and 3) any preliminary actions of the plaintiff relating to the taking of the property." [California Code of Civil Procedure, Section 1263.330] Therefore, the fair market value of the larger parcel assumes the property is appraised as if there is no project.
2. The valuation of the subject property, in the condition after the partial acquisition and the construction and use of the project, presumes a hypothetical condition that the Oroville Spillway Emergency Recovery Transmission Line Relocation Project has been completed.

¹⁰ Uniform Standards of Professional Appraisal Practice, 2016-2017 Edition, P. 27

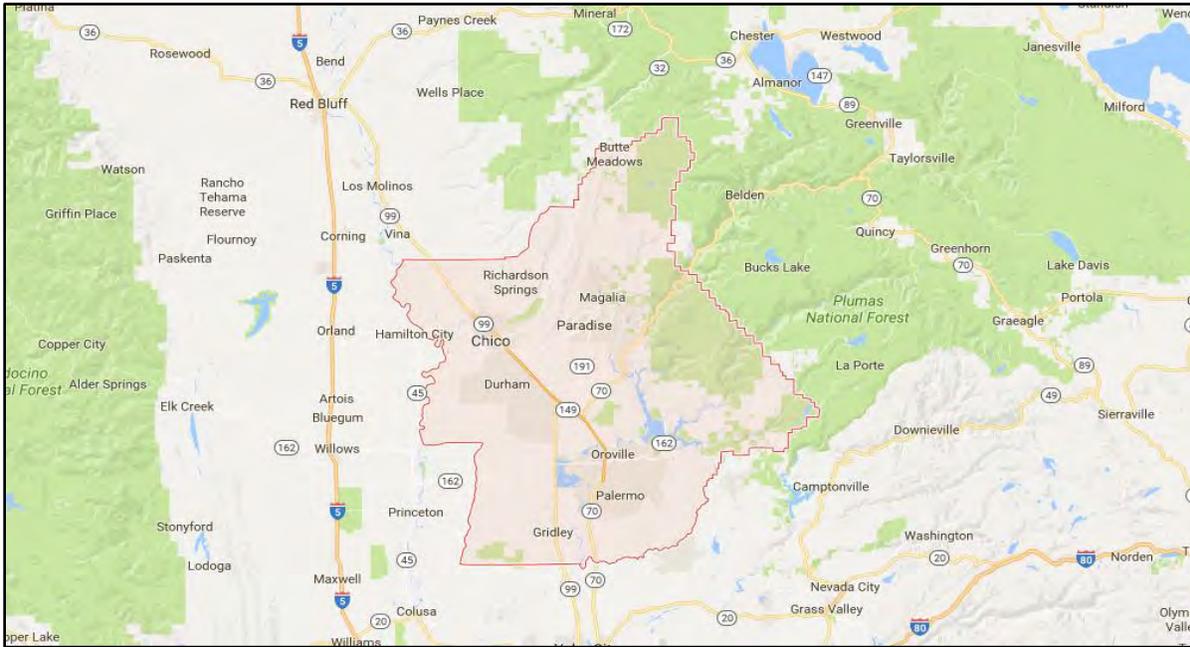
¹¹ Uniform Standards of Professional Appraisal Practice, 2016-2017 Edition, P. 27

II. BUTTE COUNTY REGIONAL OVERVIEW

GEOGRAPHIC CONSIDERATIONS

The larger parcel is located in the southeast portion of Butte County. Butte comprises the entirety of the Chico Metropolitan Statistical Area. Geographically, the county is mostly a valley region, predominantly used for agricultural purposes, with some foothills on the northeastern portion of the county.

REGIONAL MAP



Regional Overview. Social, economic, governmental, and environmental forces influence property value since real estate is an immobile asset. In this section, an examination of these location factors provides the context for the valuation of the subject property. The larger parcel is situated in Butte County. The area analysis begins with regional data and relevant trends, followed by specific characteristics of the subject's neighborhood.

Geography. Butte County lies in north central California at the northern end of the Sacramento Valley, approximately 150 miles northeast of San Francisco and 70 miles north of Sacramento. Butte County extends into the northern Sierra Nevada mountain range. The county's total land area including incorporated municipalities is approximately 1,680 square miles (1,073,000 acres) and ranges in elevation from approximately 60 feet above sea level in the southwest corner of the county, adjacent to the Sacramento River, to 8,100 feet above sea level in the northeast corner of the county, near Butte Meadows.

Defined by mountains, hills and rivers, the valley is where Butte County shows off its agricultural bounty. Occupying almost half of the county's land, the valley is a wide and expansive green plain, neatly divided with hedge rows that protect acres of cropland, nut and fruit orchards, and meadows for livestock grazing. A beautiful view of the Sacramento Valley is afforded from the foothill region, which encompasses a quarter of Butte County's land area. Feather Falls, the sixth tallest waterfall in the entire United States at 410 feet tall, is a hidden gem of the Butte County foothills. The foothill region also includes the red sand beaches and placid waters of the Lake Oroville State Recreation Area.

The mountain region makes up the remainder of Butte County and encompasses the majority of its eastern border. There is little urban development in this part of the county, and a large amount of the land is State and federally-owned. Lassen National Forest is located at the northern tip of the county, named for Mount Lassen, a volcano that lies within the southern Cascade Range. Farther south is Plumas National Forest, which is famous for its old-growth trees.

Oroville Lake. The subject property lies immediately southwest of Lake Oroville and directly south of the Feather River and Oroville Dam. The lake is situated 5 miles northeast of the city of Oroville, within the Lake Oroville State Recreation Area, in the western foothills of the Sierra Nevada. It is known as the second-largest reservoir in California and is treated as a keystone facility within the California State Water Project by storing water, providing flood control, recreation, freshwater releases assist in controlling the salinity intrusion Sacramento-San Joaquin Delta and protecting fish and wildlife.

In February 2017, Oroville Dam's main and emergency spillways were significantly damaged, prompting the evacuation of more than 180,000 people living downstream in Oroville and along the Feather River.

Population. As of January of 2017 (most recent available data), Butte County had an estimated population of 226,404, an increase of 0.76 percent over the 2016 population. The rate of growth of Butte County is slightly slower, but generally similar to the State as a whole over the same time. It is noted, however, that some of the cities in Butte County have experienced relatively high population growth rates with Chico and Gridley leading the way from 2016 to 2017. The table below contains the 2012 population data through January of 2017 populations for the state, county, and cities for the Butte county area.

Population Estimates: California and Butte County						
Area	1/1/2012	1/1/2013	1/1/2014	1/1/2015	1/1/2016	1/1/2017
California	37,881,357	38,238,492	38,572,211	38,915,880	39,189,035	39,523,613
Butte County						
Biggs	1,703	1,713	1,708	1,767	1,899	1,905
Chico	88,068	89,283	90,217	91,306	92,117	93,383
Gridley	6,519	6,648	6,655	6,654	6,663	6,704
Oroville	15,524	15,989	15,994	16,139	17,999	18,037
Paradise	25,915	25,759	25,769	25,739	25,755	25,841
County Total	221,064	222,341	223,301	224,467	224,703	226,404

Source: Department of Finance Population Estimates

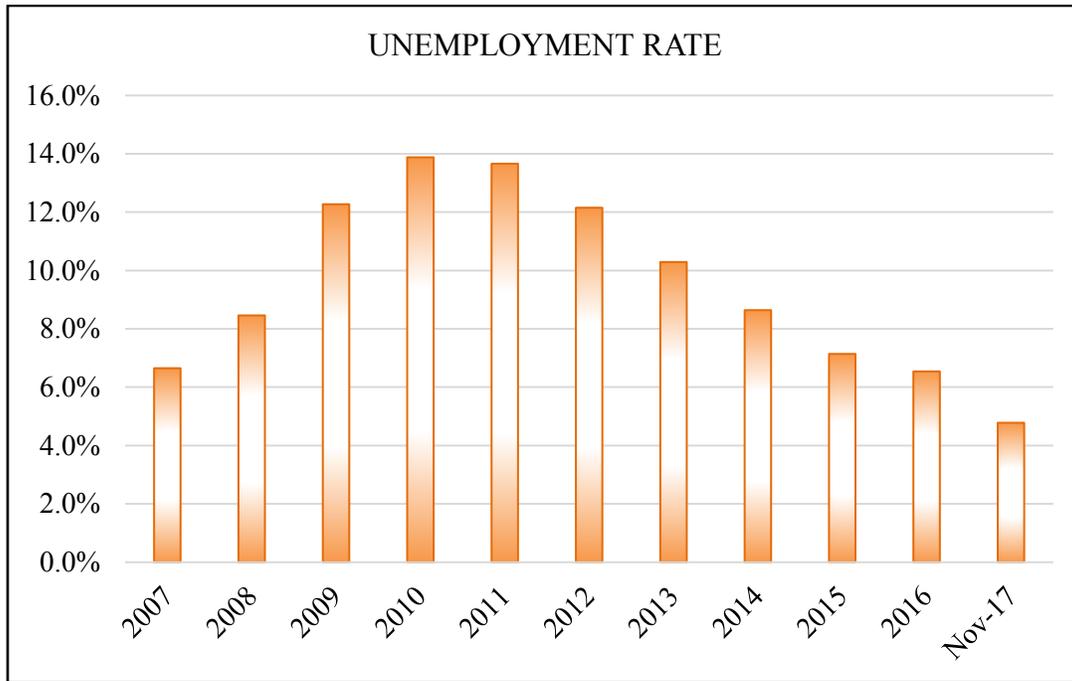
Cities / Communities. Butte County contains five incorporated cities and 25 unincorporated communities. The four largest urban areas of the county are Chico, Paradise, Oroville, and Gridley, with Oroville as the county seat. Chico is the most populous city in Butte County. The city is a cultural, economic, and educational center of the northern Sacramento Valley and home to both California State University Chico and Bidwell Park, the country's 26th largest municipal park and the 13th largest municipally-owned park.

Unemployment Rates. The following table presents the civilian labor force, employment, and the unemployment rate for The Chico MSA for 2007 to November of 2017, the most current data available.

Labor Force Data – Chico MSA				
Year	Labor Force	Employment	Unemployment	Unemp. Rate
2007	101,200	94,500	6,700	6.7%
2008	102,800	94,100	8,700	8.5%
2009	103,700	91,000	12,700	12.3%
2010	102,600	88,300	14,200	13.9%
2011	100,600	86,900	13,800	13.7%
2012	101,000	88,700	12,300	12.2%
2013	101,700	91,300	10,500	10.3%
2014	101,400	92,700	8,800	8.6%
2015	101,300	94,100	7,200	7.1%
2016	102,300	95,600	6,700	6.5%
Nov-17	103,900	98,900	5,000	4.8%

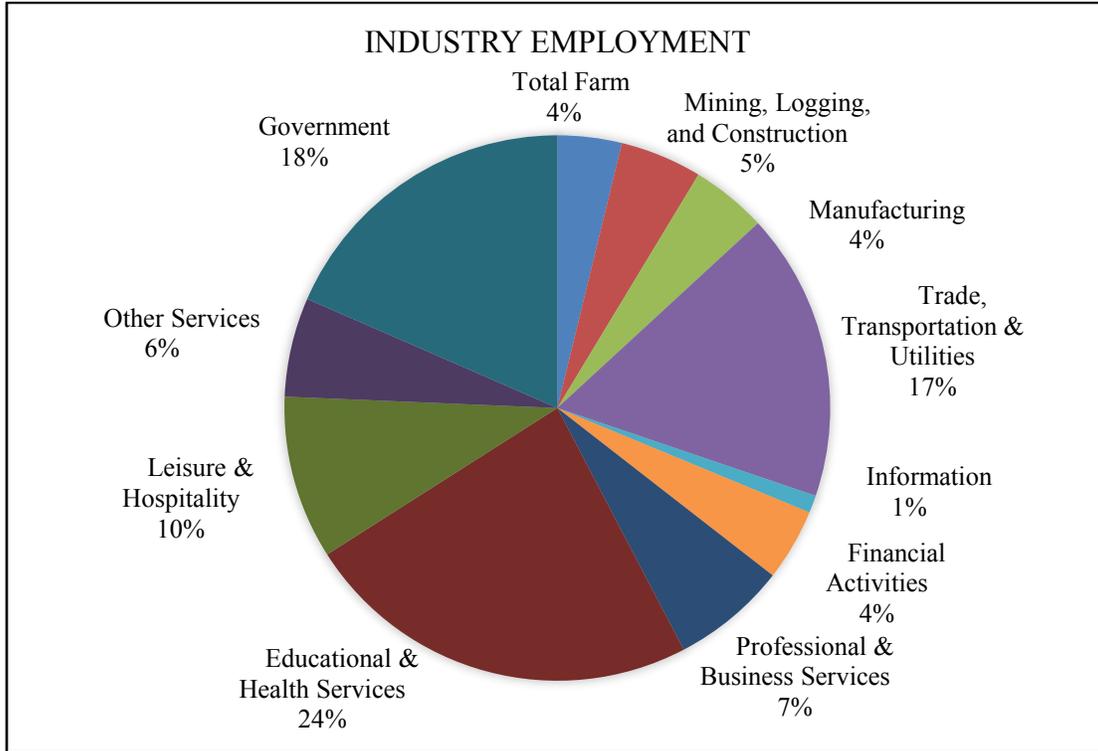
Source: California Employment Development Department (EDD)

According to the Employment Development Department, the most current unemployment statistics indicate an unemployment rate of 4.8% for the Chico MSA. The unemployment rate spiked in the 2009 through 2013 years in accordance with the depressed economic conditions. Since that time, the unemployment rate has been steadily declining. The average unemployment rate as of September 2017 for the State of California is 4.6%.



Industry Employment. According to the California Employment Development Department’s December 2017 publication (covering November 2017 data), the Chico MSA had an increase by 1,000 jobs over the year.

Per the November 2017 statistics provided by the California Employment Development Department, the largest employers in the Chico MSA are the Educational and Health Services, trade, Government industries, and the Transportation and Utilities trade. Shown on the following pie chart are the leading industries and their respective percentage of the MSA Region’s total employment.



Between August 2016 and August 2017, total nonfarm employment increased by 1,000 jobs or 1.2 percent. The agricultural industry held steady with 3,300 individuals. Education and Health Services led the year-over gains adding 900 jobs. Behind Education and health Services were the Professional and Business Services industry and the Mining, Logging, and Construction industry (both at an increase of 400 jobs) and Other Services, which increased by 300 jobs year-over-year.

While the region has recently experienced additional job losses, overall the county has experienced minimal job losses within the last year, and as a whole the county has gained jobs in nonfarm jobs. The unemployment rate is decreasing, steadily, and appears to be consistently trending downward.

Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property

Major Employers. Butte benefits from several public universities and colleges within the county, as well as numerous universities in nearby counties. The labor market is comprised of many hospitals and government employers, as well as a great deal of agricultural produce companies. Shown below are major employers within the Butte County region (provided by the California Development Department).

Employer Name	Location	Industry	No. of Employees
Enloe Medical Ctr	Chico	Hospitals	1,250-5,500
Oroville Hospital	Oroville	Hospitals	1,000-4,999
Pacific Coast Producers	Oroville	Canning (mfrs.)	1,000-4,999
California State-Chico	Chico	Schools-Universities & Colleges Academic	500-999
Enloe Medical Ctr	Chico	Hospitals	500-999
Feather Falls Casino KOA	Oroville	Campgrounds	500-999
Feather River Hospital	Paradise	Hospitals	500-999
Lifetouch National Schl Studio	Chico	Photographers-Portrait	500-999
Butte County Mental Hlth Svc	Chico	Mental Health Services	500-999
Sierra Nevada Taproom & Rstrnt	Chico	Restaurants	500-999
Enloe Homecare	Chico	Hospices	250-499
Butte Community Insurance Agcy.	Chico	Insurance	250-499
Butte County Comm. Employment	Oroville	Employment Agencies & Opportunities	250-499
Butte County Sheriff	Oroville	Government Offices-County	502-999
Butte County Social Welfare	Oroville	Government Offices-County	250-499
Chico High School	Chico	Schools	250-499
Knife River Construction	Chico	Asphalt & Asphalt Products	250-499
Northern California Homes	Paradise	Real Estate	250-499
Orchard Hospital	Gridley	Hospitals	250-499
United Healthcare	Chico	Medical Insurance Plans	250-499
Walmart	Chico	Department Stores	250-499
Wehah Farms Inc	Richvale	Rice Mills (mfrs.)	250-499
Wil-Ker-Son Ranch & Packing Co	Gridley	Fruits & Veg.-Growers & Shippers	250-499

Household Income. According to Site To Do Business (STDB), the median household income within the county is \$45,688, as of 2017. This is expected to increase by approximately 5.0% over the next five years. This compares to an overall State median income of \$65,223.

Household Income Distribution Within County				
Income	2017		2022	
	Number	Percentage	Number	Percentage
<\$15,000	13,699	15.1%	14,514	15.6%
\$15,000 - \$24,999	11,562	12.8%	11,663	12.5%
\$25,000 - \$34,999	10,191	11.3%	9,943	10.7%
\$35,000 - \$49,999	12,672	14.0%	11,592	12.5%
\$50,000 - \$74,999	16,143	17.8%	14,403	15.5%
\$75,000 - \$99,999	10,084	11.1%	10,711	11.5%
\$100,000 - \$149,999	9,537	10.5%	11,710	12.6%
\$150,000 - \$199,999	3,622	4.0%	4,740	5.1%
\$200,000+	2,942	3.3%	3,728	4.0%
Total	90,452		93,004	
Avg. Household Income	\$64,432		\$72,646	
Median Household Income	\$45,688		\$47,979	

Source: STDB Data

At current estimates, and considering future projections, the county is still well below the state median income and is expected to increase in income at a much slower rate than that of the state as a whole.

Home Values. The median home price within the county is \$283,395, as of 2017. At current growth rates, the median price is expected to increase by nearly 31% over the next five years. While the median home value in Butte County is well below the state median of \$470,246, the county is currently projected to significantly outpace the growth rate of the state overall.

Butte County Estimate of Owner-Occupied Housing Values				
Value	2017 County Total		2022 County Total	
	Number	Percentage	Number	Percentage
<\$50,000	4,475	8.8%	3,269	6.3%
\$50,000-\$99,999	2,756	5.4%	1,521	3.0%
\$100,000-\$149,999	3,349	6.6%	1,673	3.3%
\$150,000-\$199,999	4,952	9.7%	2,919	5.7%
\$200,000-\$249,999	5,922	11.6%	4,431	8.7%
\$250,000-\$299,999	6,054	11.9%	5,362	10.5%
\$300,000-\$399,999	9,437	18.5%	9,661	18.9%
\$400,000-\$499,999	5,542	10.9%	8,059	15.8%
\$500,000-\$749,999	5,833	11.4%	9,982	19.6%
\$750,000-\$999,999	1,528	3.0%	3,015	5.9%
\$1,000,000+	1,147	2.2%	2,212	4.3%
Total	50,995		52,104	
Estimated Median Housing Value	\$283,395		\$371,183	

Current median home prices and income levels suggest that the county is within an affordable index regarding living costs, according to the Census Bureau's affordability index and considering conventional financing. However, if the county continues to increase in home pricing at its projected rate, this affordability will begin to suffer. As with most of the areas throughout California, the rise in home pricing is continuing at rapid paces, and unless slowed, housing costs will grow beyond affordability.

CONCLUSION

Butte County is a relatively rural county, with the main job centers focusing on health and education, trade and transportation, and government positions. The county is experiencing steady population growth and continues to recover from the recession as unemployment falls and median home prices rise. While net employment gains have been positive, the unemployment rate in Butte County is still slightly above the state average, signifying that recovery is still in progress. However, the major indicating factors show a generally healthy economy that continues trending upward.

III. NEIGHBORHOOD DESCRIPTION

The property appraised is located just northeast of Oroville, California. More specifically, the property is located south of the Oroville Dam, off Oro Dam Boulevard. Below is an area map noting the property's general location, respective to the city of Oroville and surrounding areas.

NEIGHBORHOOD MAP



OROVILLE DEMOGRAPHICS

The subject property is located just outside of the city of Oroville, in Butte County. Oroville is the county seat of Butte County and is located off of State Route 70. The city is also in close proximity to State Route 99 which connects the county with Interstate 5.

Population. As of 2017 (latest data available), the total population for the city of Oroville was 18,037. This represents a 16% increase in population since 2010. Oroville is one of the largest cities within the greater Butte County region. The following chart shows the population, as well as additional demographic data for the city of Oroville.

Demographics Oroville, California			
Population		Income	
2017 Total Population	18,037	2017 Per Capita Income	\$19,779
2010 Total Population	15,546	2017 Median Household Income	\$38,882
		2017 Average Household Income	\$50,696
Households		2017 Median Home Value	
2022 Total Households	6,007		\$187,447
2017 Total Households	5,868	Household Income (2017)	
% Households Change	2.4%	<\$15,000	6.7%
2017-2022		\$15,000-\$24,999	2.5%
		\$25,000-\$34,999	2.5%
		\$35,000-\$49,999	9.2%
2017 Occupancy		\$50,000-\$74,999	15.8%
% of Renters	51.5%	\$75,000-\$99,999	9.2%
% of Homeowners	38.6%	\$100,000-\$149,999	30.0%
		\$150,000-\$199,999	14.2%
		\$200,000+	10.0%

Households and Occupancy. In 2017 Oroville had a total of 5,868 households. Site to Do Business (STDB) projects that this number will increase 2.4% by 2022. Currently, over half of the city is occupied by renters, while the other 38.6% is occupied by homeowners and 9.9% is vacant.

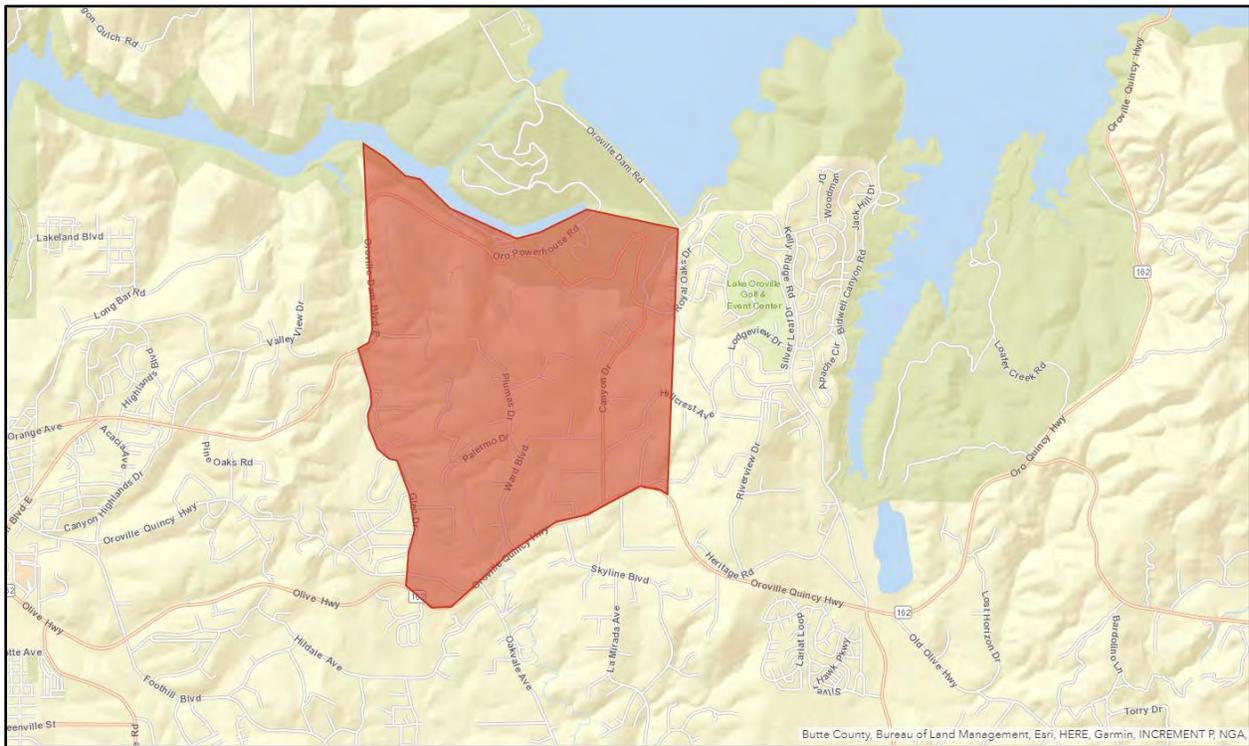
Income and Home Values. The median household income for the Oroville area was \$38,882 in 2017; the average was \$50,696. The 2017 median home value was \$187,447. Currently, housing costs within the area are considered affordable, according to the Census Bureau.

SUBJECT PROPERTY'S IMMEDIATE NEIGHBORHOOD

The subject property is located just south of Oroville Lake, off Oro Dam Boulevard. The property is proximal to the Feather River and the Oroville Lake Dam. The general area is considered East Oroville, a large, unincorporated community just east and northeast of Oroville proper. Small portions of this community are more densely developed with single family residences; however, the majority of the community is rural in nature, with agricultural, recreational, and rural single-family contributing to the major land uses. The community does house the Gold Country Casino, just east of the city of Oroville.

The subject neighborhood is defined as the northern portion of this unincorporated community. The neighborhood boundaries have been determined based on contiguous land uses and major roadways or bodies of water (such as the Feather River). The neighborhood is bound by Oroville Quincy Highway to the south, Oro Dam Boulevard to the west, the Feather River to the north, and the boundary of the Kelly Ridge subdivision to the east. A map of the defined neighborhood area is shown below.

SUBJECT'S IMMEDIATE NEIGHBORHOOD AREA



The subject's immediate neighborhood consists primarily of very low density, rural residential property. Also, given the location of the neighborhood (near the Oroville Dam), PG&E and the State of California have a significant number of landholdings in this area.

Access. The area can be accessed by two major thoroughfares, Oro Dam Boulevard and Oroville Quincy Highway (also known as Highway 162). In addition to these two major thoroughfares there are several smaller roadways allowing access to the inner areas of the subject's neighborhood.

Population and Housing. The total population within the subject's immediate neighborhood was 572 as of 2017. This further demonstrates the rural nature and sparsely populated characteristic of the neighborhood. According to Site to do Business, the population is expected to increase by 0.9% throughout the next five years. The median home value within the area, as of 2017, is \$289,286, with a median household income of \$59,825.

Labor Force. According to STDB, the labor force within the neighborhood is mainly employed by the services industry, which employs 50% of the employees in the area. Positions within the services industry throughout this region include jobs in the professional, administrative support, and management or business sectors, and it is likely that many in the area are either self-employed or commute to other areas such as Oroville, Chico, or Paradise. Beyond the services industry, the Transportation and Utilities industry and the Construction industry employ 16.8% and 12.4% of the labor force in the area, respectively.

Oroville Dam and the Spillway Incident. As previously mentioned, the subject property is located less than a quarter mile southwest from the Oroville Dam. The Oroville Dam is the tallest dam in the United States, and serves for water supply, hydroelectricity generation, and flood control. The dam impounds Lake Oroville, the second largest man-made lake in the State of California.

In the midst of widespread rainfall during the 2017 California floods, damage to the dam's main spillway appeared on February 7, resulting in its closure as management tried to assess the extent of damage and ways to mitigate further damage. As storms dumped significant precipitation on the area, the lake level rose until it flowed over the concrete weir at the top of the dam's emergency spillway, despite the reopening of the damaged main spillway. As water flowed uncontrolled over the weir, headward erosion of the emergency spillway threatened to undermine and collapse the concrete weir. A collapse never occurred, but the main spillway suffered significant damage and the bare slope of the emergency spillway was significantly eroded. Hundreds of thousands of residents in the Butte and Sutter county areas were evacuated due to threats from the incident. In addition, some properties along the feather river suffered damage due to the influx of water and debris caused by the incident.

Following the initial incident, the Department of Water Resources began to work around the clock to repair damage to both spillways. On October 16, 2017 DWR released the operations plan for Lake Oroville during the 2017-18 rainy season to protect public safety while construction continues on the reservoir's main and emergency spillways. Work to repair and reconstruct the main spillway has been underway since April 2017. As of November 1, the main spillway is prepared to handle releases of up to 100,000 cubic-feet per second (cfs). By next season, it will be fully reconstructed to handle the original design capacity of 270,000 cfs. Releases from the main spillway have never been above 160,000 cfs. The latest report from the investigative team was released in January of 2018, and physical factors contributing to the incident are being addressed throughout the current engineering and construction.

CONCLUSION

While population within the neighborhood is limited, the majority of the labor force in the area is employed in services, with transportation and construction as secondary major industries. The median income levels are far above that of the city as a whole and are projected to continue rising. Overall, while the area is generally seen as a rural neighborhood, it benefits from its proximity to the city of Oroville and the lake's recreational area.

IV. IDENTIFICATION OF LARGER PARCEL / PROPERTY DESCRIPTION

DETERMINATION OF LARGER PARCEL

The “Larger Parcel” is defined as a portion of a property which has unity of ownership, contiguity, and unity of use defines the larger parcel. Ownership records for surrounding properties have been reviewed and the subject property ownership (PG&E) has title interest in numerous parcels proximate to the two affected subject parcels (APNs 033-010-055 and 069-010-019). The two affected subject parcels are part of an existing public PG&E Transmission Tower Line corridor. The existing PG&E Transmission Tower Lines run along the northern end of the two subject properties (adjacent to DWR’s transmission tower lines) and are part of PG&E’s Caribou-Table Mountain-Palermo 230KV Towerline. Additionally, the two affected parcels are zoned and have a general plan designation of Public. Given the public use nature of the subject, we must conclude with the alternative economic highest and best use of the property which is for rural residential use, consistent with the most likely zoning and general plan designation of Very Low Density Residential (VLDR). Given the overall size, shape and utility of the two affected parcels, they are considered to be independently buildable (seperate from the larger public utility corridor) based on the alternative economic use for rural residential. Based on the previous discussion, the two affected parcels meet all the tests of the larger parcel, defined as the subject’s 236.42± acre property identified as APNs: 033-010-055 and 069-010-019.

IDENTIFICATION OF PARCEL OWNERSHIP

Property Address:	No Site Address
Property Location:	Northeast Quadrant of Oro Dam Boulevard East and Rusty Dusty Road in Butte County, California 95966
APNs:	033-010-055 and 069-010-019
Owners:	Pacific Gas and Electric Company, a California Corporation (as per the preliminary title report provided by Fidelity National Title Company, dated March 8, 2017).
Mailing Address:	P.O. Box 770000 San Francisco, California 94177
Representatives:	Heather Gresham, Hydro Land Agent with PG&E and Laird Oelrichs, Land Agent with PG&E
Telephone:	(530) 896-6443 - Heather Gresham (530) 896-4258 - Laird Oelrichs
Owner Title Interest:	Fee Simple

Ownership History: According to the property owner as well as reference to public records, there have been no sales, listings or offers to purchase the subject property within the past five years. The purpose of this appraisal is to establish the current fair market value for DWR to purchase three permanent easements on the property.

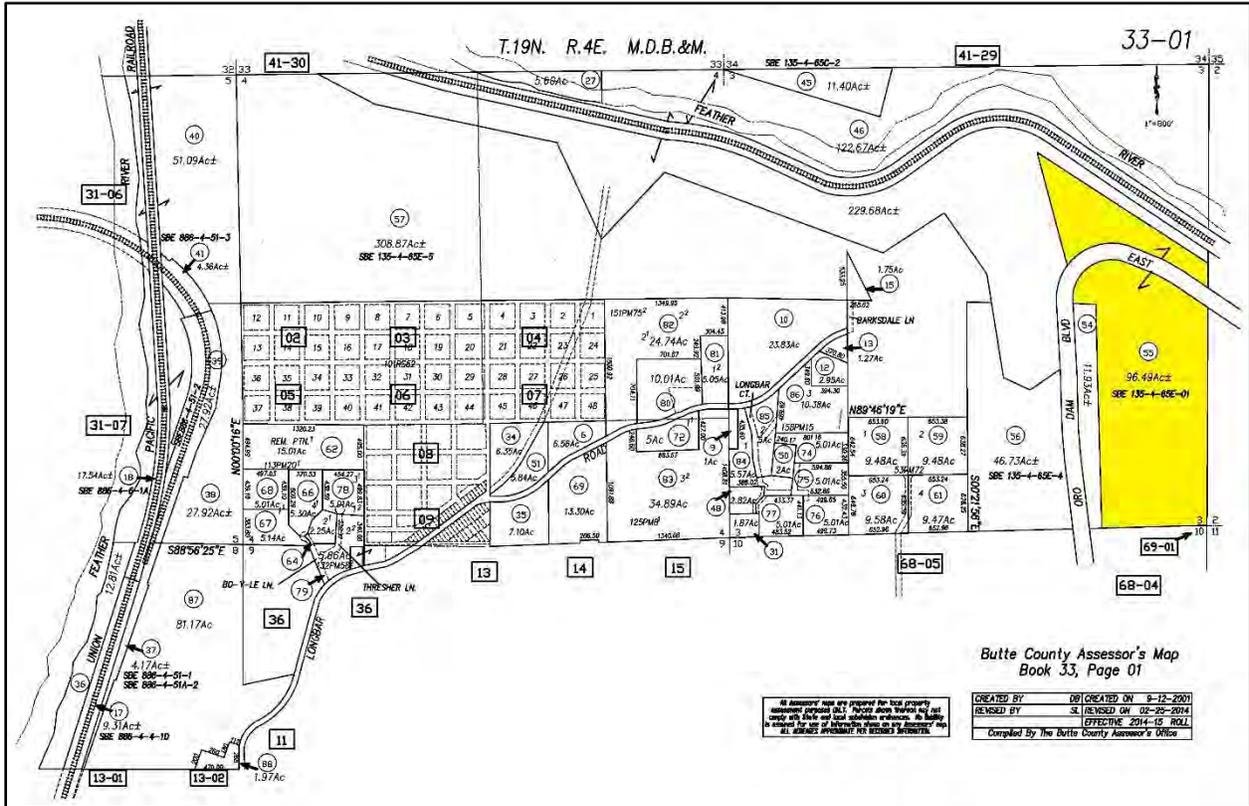
Date of Inspection: Kelli Johnson, Alysia Ballantyne and Russell Layton with Bender Rosenthal, Inc. inspected the property on January 25, 2018 with the PG&E property representatives, Heather Gresham (Hydro Land Agent with PG&E) and Laird Oelrichs (Land Agent with PG&E) and Bradley Johnson (acquisition agent with DWR). David Wraa, MAI, ARA, AI-GRS subsequently inspected the subject neighborhood.

Date of Value: January 25, 2018

Date of Report: February 9, 2018

Oroville Spillway Transmission Line Relocation Project
 Butte County, California
 PG&E Property

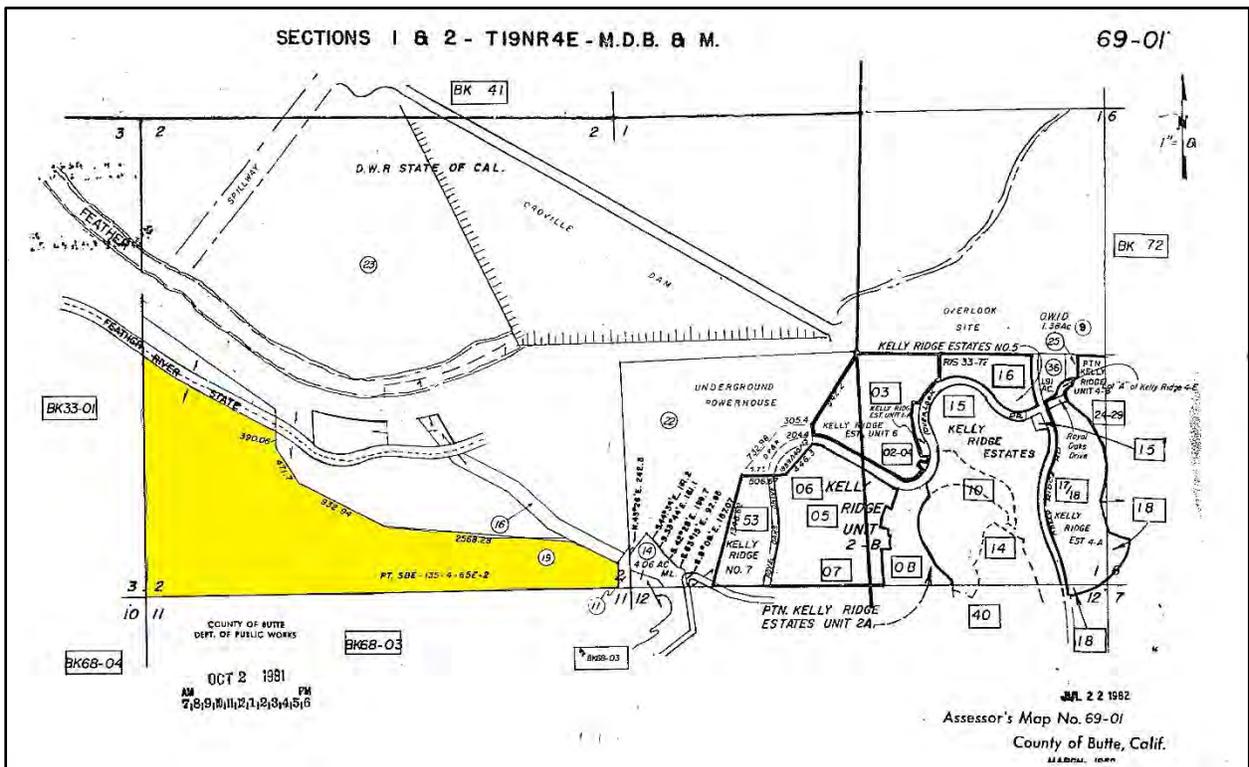
ASSESSOR'S PARCEL MAPS



Butte County Assessor's Map
 Book 33, Page 01

All assessor's maps are prepared for local property owners and are subject to change without notice. The Assessor's Office is not responsible for errors or omissions. All addresses are approximate and for general reference only.

CREATED BY: [Name] CREATED ON: 9-12-2001
 REVISION BY: [Name] REVISION ON: 02-29-2004
 EFFECTIVE: 2004-05-01
 Compiled By The Butte County Assessor's Office



OCT 2 1991
 AM 7,8,9,10,11,12,13,4,5,6 PM

JUL 22 1982
 Assessor's Map No. 69-01
 County of Butte, Calif.
 M.A.R.P.M. 1000

LARGER PARCEL DESCRIPTION

- Size:** 236.42± acres, according to the Butte County Assessor's Parcel Maps.
- Shape:** Irregular in shape but functional for rural residential related uses.
- Frontage:** Oro Dam Boulevard East bisects the subject property and thus, the subject has frontage along both sides of Oro Dam Boulevard East.
- Accessibility:** Access to the subject property is via Oro Dam Boulevard East.
- Exposure:** The subject has local exposure along Oro Dam Boulevard East.
- Topography and Drainage:** The subject property is situated on a hillside with significantly sloping topography and appears to be adequately drained. Additionally, the site is densely wooded.
- Utilities:** Based on discussions with the two PG&E representatives (Heather Gresham and Laird Oelrichs), there are no utilities that they are aware of to the site.
- Zoning:** Public (PB). The purpose of the PB zone is to allow for public and quasi-public facilities that serve Butte County residents and visitors and enhance the quality of life within the county. Permitted uses in the PB zone include public and private schools; parks and playgrounds; community centers; interpretive facilities; public libraries; governmental offices; and police and fire stations. Uses permitted with the approval of a Conditional Use Permit include hospitals, cultural institutions, religious facilities, and large-scale facilities such as dams and reservoirs, landfills, cemeteries and mausoleums, correctional institutions, major utilities, and other similar public works projects. The maximum FAR in the PB zone is 0.5. The PB zone implements the Public land use designation in the General Plan.

Specific Plan: N/A

General Plan Designation: The General Plan of Butte County has designated the property as Public/Quasi-Public. The Public/Quasi-Public category encompasses several types of uses, including parcels owned by federal, State and County agencies; publicly-owned parcels; parcels owned by special districts; and parcels that accommodate civic and institutional uses, such as churches and hospitals, and utilities. Public and quasi-public uses account for approximately 178,400 acres (15 percent of the county’s area) within the unincorporated county.

Soils: The subject property is composed entirely of Dunstone-Loafecreek non-irrigated soils, Class VII. The Dunstone-Loafecreek soils are broken down into three different slopes on the subject property including 12.4% at 2 to 15 percent slopes, 55.8% at 15 to 30 percent slopes and 31.8% at 30 to 50 percent slopes as detailed in the table below.

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
552	Dunstone-Loafecreek , 2 to 15 percent slopes	7	31.1	12.4%
553	Dunstone-Loafecreek , 15 to 30 percent slopes	7	140.6	55.8%
554	Dunstone-Loafecreek , 30 to 50 percent slopes	7	80.3	31.8%
Totals for Area of Interest			252.1	100.0%

These soils are well drained; high runoff and generally support uses for livestock, grazing, wildlife habitat, watershed, recreation and homesite development.

Williamson Act: N/A

Current Entitlement Status: N/A

Parcel Improvements: Other than the existing PG&E transmission tower line facilities and DWR’s transmission tower line facilities (which is the purpose of one of the proposed easements), the subject is vacant land that is densely wooded.

Lease or Rental Status:

N/A

Easements:

A preliminary title report provided by Fidelity National Title Company dated March 8, 2017 was provided for review. A copy of the preliminary title report is included in the addenda of this appraisal report.

There are two exceptions for easements on the subject property. The first easement is granted to the State of California (Parks and Recreation) for the purpose of maintaining riding and hiking trails and is relatively narrow at 20 feet wide. The other easement is also granted to the State of California but is for the purpose of an underground cable and is also only 20 feet wide and relatively short in length. Lastly, there is an exception on title for the rights of the rights of the public to Oro Dam Boulevard.

It is our opinion that the utility and hiking trail easements are typical to similar rural residential/agricultural market transaction properties alike. Given that these easements are very small and narrow and are somewhat typical, they don't require a special deduction and their existence is inherently recognized in our appraised conclusion of value. However, the roadway easement is a significant loss of the fee estate's rights and constitutes almost 100% reduction of the underlying fee value. Therefore, we have concluded there is a \$1 remaining fee value where a roadway exists. Based on the appraiser's aerial measurements, 2.06 acres of the proposed tower line easement overlaps with the existing roadway (Oro Dam Blvd).

Encroachments:

No encroachments were disclosed or observed on the subject property by the appraiser.

Private Restrictions:

None were disclosed or observed on the subject property by the appraiser.

Flood Zone:

The subject is located within flood zone X (unshaded), according to FEMA Flood Insurance Rate Map 06007C-00795E, revised January 6, 2011. The X flood zone is defined as an area of minimal

flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.

Wetlands:

No known wetlands were apparent on the subject property at the time of the inspection. The appraiser is not an expert in the field of detecting wetlands. No environmental reports were provided, and we assume no wetlands exist on the property (see Extraordinary Assumption #2).

Seismic Information:

The subject property is not within a Fault-Rupture Hazard Zone (formerly an Alquist-Priolo Special Studies Zone), according to Special Publication 42, "Fault-Rupture Hazard Zones in California", published by the California Department of Conservation, Division of Mines and Geology, revised 2007. No active faults are located on or in the proximity of the property. However, strong earthquakes generated along any of the active California faults may affect the site depending on the characteristics of the earthquake and the location of the epicenter. In general, the effects should be confined to shaking and/or acceleration (shock waves) and potential damage to structures should be minimized by employing adequate design and construction procedures.

Because Butte County, and most of the State of California, is a seismically active region, the potential for earthquake-induced hazards must be acknowledged. However, the history of past earthquake activity does not indicate that Butte County is a particularly hazardous area. Current engineering design, and construction practices, such as the Uniform Building Code, provides the opportunity to reduce earthquake related hazards.

**Cultural, Recreational and
Historical Significance:**

None

Toxic Hazards:

The appraisers did not observe any unusual conditions while performing the inspection. However, Bender Rosenthal, Inc. and the

representatives thereof, are not experts in this field. Please refer to Item 16 of the Assumptions and Limiting Conditions.

**Property Tax Data and
Projected Taxes:**

The subject property is owned by PG&E. As such, the county assessor does not tax other government agencies. Thus, there are no assessments or property taxes associated with the subject property.

Overall Comments:

The affected subject property consists of two parcels, owned by PG&E and zoned public, which are located in Butte County along Oro Dam Boulevard East, northeast of the City of Oroville and proximate to the Oroville Dam. Combined the two parcels total 236.42 acres and are situated on a hillside with significantly sloping topography and appears to be adequately drained. Other than the existing PG&E transmission tower line facilities and DWR's transmission tower line facilities (which is the purpose of one of the proposed easements), the subject is vacant land that is densely wooded. Oro Dam Boulevard East bisects the subject property and surrounding the two affected subject parcels are numerous public zoned properties owned by PG&E and DWR as well as the Feather River, Oroville Dam and Lake Oroville.

Positive attributes of the property are the location in Butte County proximate to the City of Oroville as well as the frontage and access along Oro Dam Boulevard and flood zone X designation. Negative attributes of the property are the lack of utilities significantly sloping topography, class VII soils and irregular shape of the property.

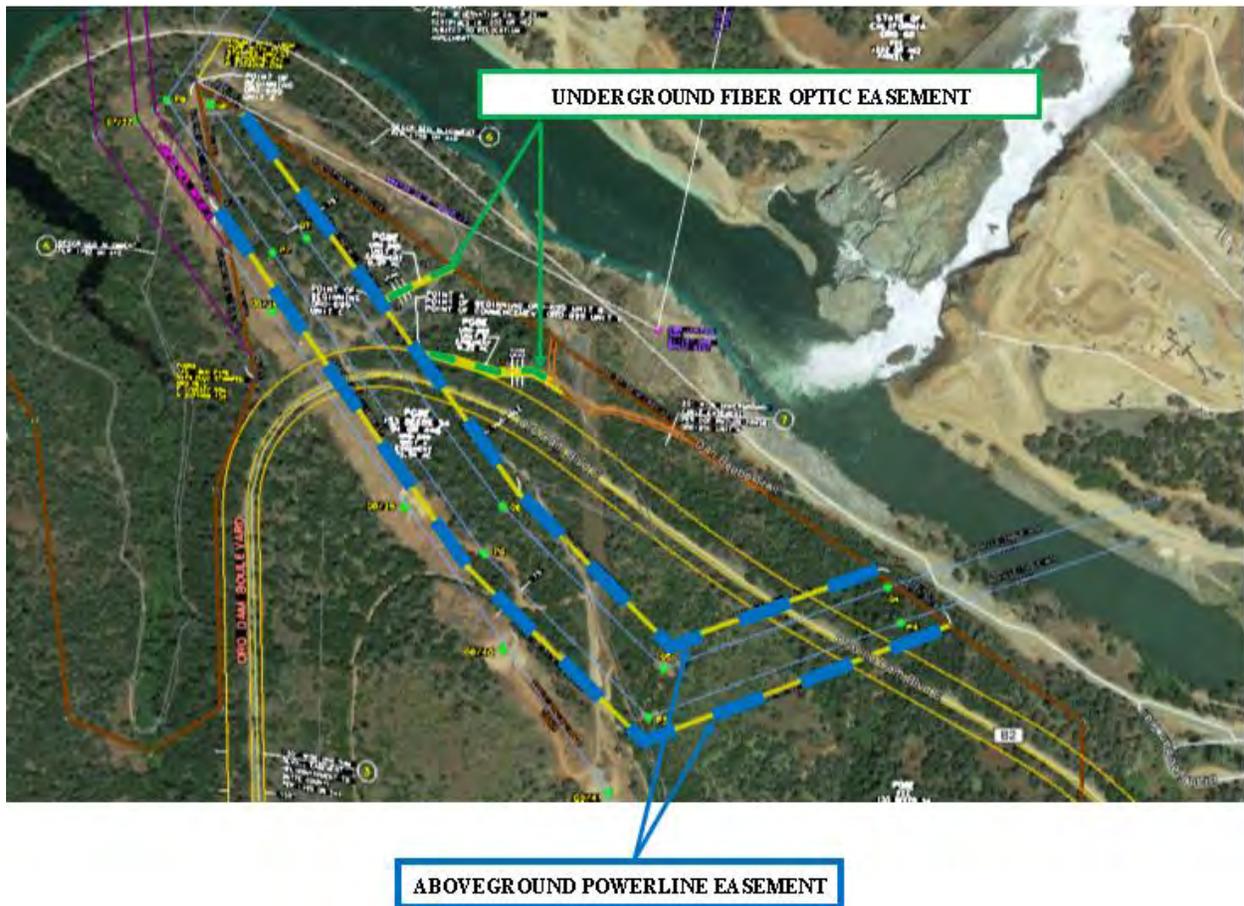
V. PROJECT DESCRIPTION AND PROPOSED ACQUISITION

DESCRIPTION OF THE PROJECT

The State of California, Department of Water Resources (DWR) is acquiring permanent easements in support of the Oroville Spillway Emergency Recovery Transmission Line Relocation Project. During the Oroville Spillway Emergency, both DWR and PG&E's permanent 230kV transmission alignments were temporarily rerouted to ensure their continued operation (DWR's 230kV line is required for the operation of Hyatt Power Plant). DWR's original alignment was positioned across the Oroville Dam's Gated and Emergency Spillways, and it was determined that a new alignment traveling outside of the projected inundation zones would provide a lower risk to infrastructure and public safety than the previous route.

DWR's permanent alignment will be situated predominately on DWR-owned real property; however, nine (9) towers will be established on the adjacent PG&E owned property (the towers are shown in the aerial below as green dots within the boldened yellow lines identifying the proposed easement area). The PG&E owned parcels that will be impacted by DWR's permanent alignment are Butte County Assessor's Parcel No(s) 033-010-055 and 069-010-019.

AERIAL EXHIBIT OF ACQUISITION AREA



DESCRIPTION OF THE PROPOSED ACQUISITION

The State of California, Department of Water Resources is proposing to acquire a 25.54-acre permanent tower line easement (ORO-699 Unit A) for the installation and operation of nine 230kV transmission towers. This proposed easement is approximately 300 feet wide and cuts diagonally across the subject parcels in a “V” shape. It is noted that as of the date of inspection these facilities have already been installed on the property (adjacent to PG&E’s existing transmission tower line facilities). According to the DWR representative, the transmission tower facilities were installed in September of 2017. As previously mentioned in this report, the existing roadway (Oro Dam Blvd) bisects the subject property and heavily encumbers the fee simple rights within this area and constitutes almost 100% reduction of the underlying fee value. Therefore, we have concluded there is a \$1 remaining fee value where a roadway exists. Based on the appraiser’s aerial measurements, 2.06 acres of the proposed tower line easement overlaps with the existing roadway (Oro Dam Blvd).

Additionally, DWR is proposing to acquire a 0.22-acre permanent underground cable easement (ORO-699 Unit B) for new fiber optic cables that have yet to be installed. This proposed easement is 20 feet wide and is relatively short and is situated just north of Oro Dam Boulevard and the proposed tower line easement. Furthermore, DWR requires another 0.07-acre permanent underground cable easement (ORO-699 Unit C) for an existing fiber optic cable that was installed previously in the 1990’s. This particular proposed easement is 10 feet wide and is also relatively short and is situated just north of the 0.22-acre cable easement.

Although the proposed easements are for two different types of uses: 1) above ground tower lines and, 2) underground utilities for the fiber optics, the Department of Water Resources is acquiring the same rights for all three. An excerpt from the draft easement agreement (that is applicable to all three proposed easement acquisition areas) is included on the following page for the reader’s reference.

1. **Grant of Easement:** PG&E hereby grants to Grantee, upon the terms and conditions set forth in this Agreement, the following easement:

(a) A non-exclusive right to construct, install, suspend, repair, replace, remove, maintain and use two (2) 230kV electrical transmission lines, each consisting of wires and cables suspended from poles, towers, or other structures; and two (2) underground conduits, pipes, manholes, service boxes, wires, cables and other electrical conductors; aboveground market posts, risers and service pedestals; underground and aboveground switches, fuses, terminals and transformers with associated concrete pads; and fixtures and appurtenances necessary to any thereof, for the transmission of electric energy and communication purposes; all within the portion of the Property (the “**Easement Area**”) described in **Exhibit B** attached hereto and made a part hereof.

(b) The right, from time to time, to trim or to cut down any and all trees and brush now or hereafter within said easement area which now or hereafter in the opinion of Grantee may interfere with or be a hazard to the facilities installed hereunder, or as Grantee deems necessary to comply with applicable state or federal regulations;

(c) A non-exclusive right of surface access, ingress and egress to and from Grantee’s facilities within the Easement Area, over and across the portion of the Property on which PG&E has constructed private roads and lanes thereon, if such there be, otherwise upon written request from Grantee, by such routes as PG&E determines, in its reasonable discretion, will occasion the least practicable damage and inconvenience to PG&E and its facilities.

Based on the above draft easement language which allows for aboveground and belowground utilities, the removal of trees as well as access we have concluded that the proposed easements will encumber 75% of the fee value. This appraisal assumes that the proposed easement will have language similar and no more restrictive than the draft easement document provided by DWR, included within the addenda of this report (see extraordinary assumption #3).

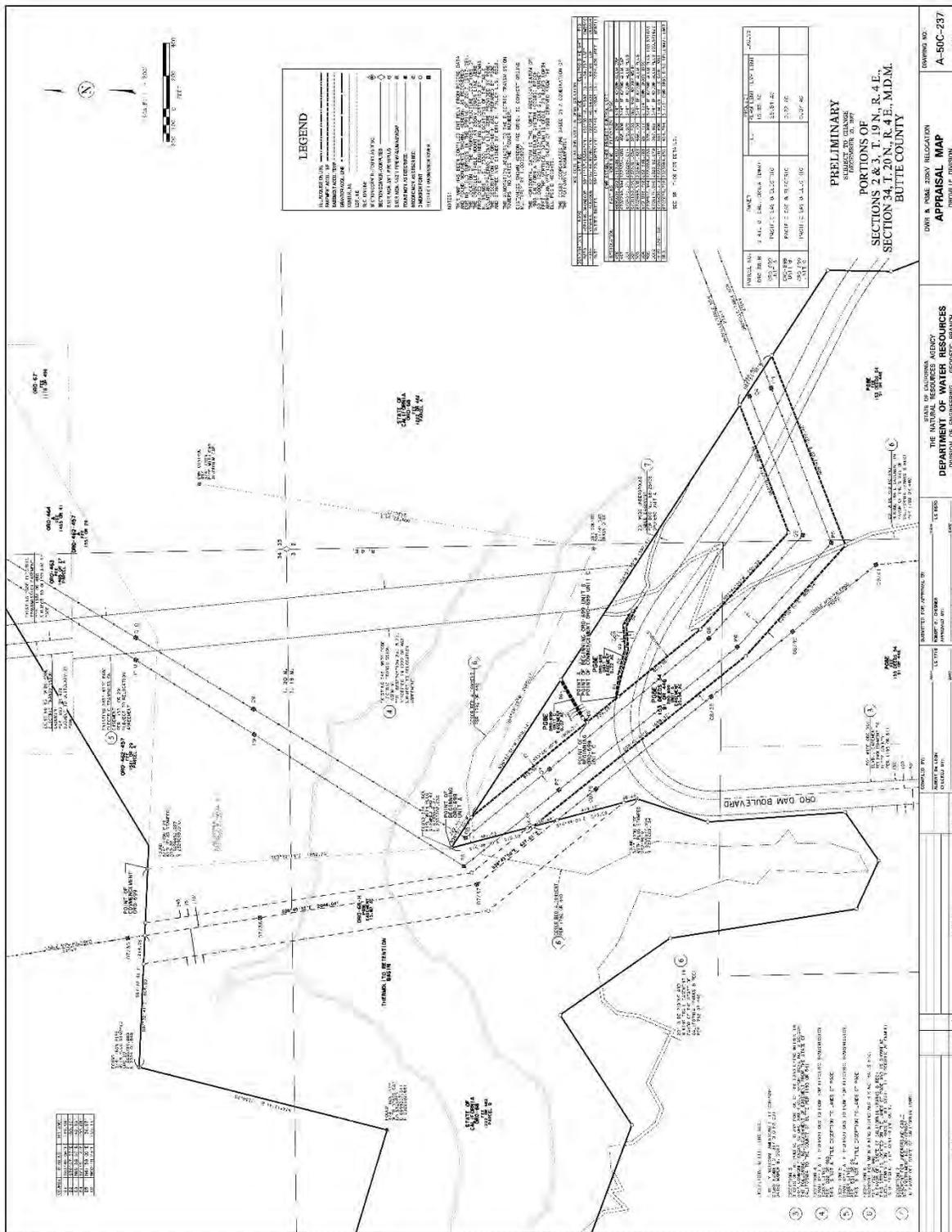
Given the public use nature of the subject, we must conclude with the economic highest and best use of the property which is for rural residential use, consistent with the most likely zoning and general plan designation of Very Low Density Residential (VLDR).

A summary of the planned acquisition follows:

Item	Total
Larger Parcel	236.42± acres
Existing SSJDD Easement: 2.97± acres	
Permanent Tower Line Easement: ORO-699, Unit A Encumbered Roadway: 2.06± acres	25.54± acres
Permanent Underground Cable Easement: ORO-699, Unit B	0.22± acres
Permanent Underground Cable Easement: ORO-699, Unit C	0.07± acres
Remainder Parcel	236.42± acres

Source of larger parcel and easement acquisition area: Butte County Assessor Map and appraisal maps provided by DWR

APPRAISAL MAP OF ACQUISITION AREA



DESCRIPTION OF THE REMAINDER

Consideration of possible impacts to the remainder included, size, shape, access, utility and change in highest and best use. Given the proposed acquisition is for an easement, the size and shape of the property remain the same as in the before condition. Additionally, the utility of the remainder parcel will not be impacted. In regard to the highest and best use of the property, given the public use nature of the subject's zoning & GP, the highest and best use of public lands is for the most likely alternative use if it were not for public use. Based on the location in Butte County and surrounding land uses and zoning, the highest and best use of the subject property would most likely be for Very Low Density Residential (VLDR). The highest and best use of the subject property for rural residential use (consistent with the Very Low Density Residential zoning) will not be affected by the proposed acquisition. In regard to access, the property will continue to have direct access along Oro Dam Boulevard East. Furthermore, there is no impact to the existing public PG&E Transmission Tower Line corridor.

VI. HIGHEST AND BEST USE ANALYSIS

Highest and best use may be defined as the reasonably probable use of property that results in the highest value.¹²

There are four criteria used in the highest and best use analysis process. These are:

1. **Legally Permissible Use.** What uses are permitted legally under existing zoning, building codes, historic district controls, environmental regulations, deed (private) restrictions, and long-term lease provisions on the site in question?
2. **Physically Possible Use.** What uses of the site are physically possible, given its size, shape, area, terrain, soils composition, accessibility, assembly potential, and risk potential from natural disaster?
3. **Financially Feasible Use.** Which possible and permissible uses will produce a positive net return to the owner of the property?
4. **Maximally Productive Use.** Among the feasible uses, which use will produce the highest residual land value consistent with the rate of return warranted by the market for that use?

Given that the subject is vacant (aside from PG&Es transmission tower lines), only the highest and best use of the subject property as an undeveloped, Very Low Density Residential-zoned site (as vacant) is necessary.

HIGHEST AND BEST USE AS VACANT

The subject is part of a public corridor currently which is viable and is not going anywhere. The adjacent uses consist of VLDR zoned land and is analyzed as such in the highest and best use analysis.

Legally Permissible Uses. Possible uses are constrained by legal restrictions on the property both private and public. As previously discussed, the subject property is zoned and has a general plan designation of Public (PB). The purpose of the PB zone and general plan is to allow for public and quasi-public facilities that serve Butte County residents and visitors and enhance the quality of life within the county. Permitted uses in the PB zone include public and private schools; parks and playgrounds; community centers; interpretive facilities; public libraries; governmental offices; and police and fire stations.

Given the public use nature of this zoning & GP, the highest and best use of public lands is for the most likely alternative use if it were not for public use. Based on the location in Butte County and surrounding land uses and zoning which include Public zoned and owned properties to the north, east and west as well as Very Low Density Residential (VLDR) to the south, the highest and best use of the subject property would most likely be for Very Low Density Residential (VLDR). The existing character of the VLDR zoned properties to the south is primarily rural residential related uses. Given the likely zoning and general plan designation of Very Low Density Residential (VLDR), use of the site for rural residential use is legally permissible.

¹² The Appraisal of Real Estate, Appraisal Institute, 14th Edition, P. 332-334

Physically Possible Uses. The size, topography, and location of the subject are important factors in determining the use of the property. The size of the site can have a significant effect on the type of development that is possible and on the economies of scale. The larger parcel is 236.42± acres, is irregular in shape and has access via Oro Dam Boulevard East. The size and shape of the parcel support a wide variety of rural residential uses permitted by right under the VLDR zoning. Additionally, the property is located in flood zone X. However, the property is situated on a hillside and is significantly sloping and also lacks utilities to the site. According to the U.S.D.A. Natural Resources Conservation Service, the non-irrigated soils are entirely Class VII. Surrounding uses consist primarily of rural residential uses to the south and public uses, including numerous properties owned by PG&E and DWR as well as the Feather River, Oroville Dam and Lake Oroville, to the north, east and west. Therefore, the subject legally and physically supports a rural residential use.

Financially Feasible Uses. The proposed property improvement must be able to deliver an income return that generates the market value sufficient to pay for the developmental costs, the risks involved, and profit appropriate for the type of development. All of the comparable sales used in our analysis were purchased for rural residential use. Based upon the underlying zoning and surrounding uses, the financially feasible/maximally productive use of the subject as vacant is for rural residential use.

Maximally Productive Use. The maximally productive use for this property that is legally permissible, physically possible and financially feasible is for rural residential use, consistent with the most likely zoning and general plan designation of Very Low Density Residential (VLDR).

Highest and Best Use Conclusion. Considering all the preceding factors, the highest and best use for this property is for rural residential use, consistent with the most likely zoning and general plan designation of Very Low Density Residential (VLDR).

HIGHEST AND BEST USE OF THE REMAINDER

The permanent easement acquisitions are not anticipated to adversely affect the size, shape or utility of the subject remainder. Current access routes will continue to be available. As previously discussed, we have concluded that there are no impacts to the remainder and the highest and best use remains the same as in the before condition, for rural residential use, consistent with the most likely zoning and general plan designation of Very Low Density Residential (VLDR). Furthermore, there is no impact to the existing public PG&E Transmission Tower Line corridor.

VII. VALUATION

VALUATION PREMISE

The subject is zoned public/quasi-public district and is part of an existing public PG&E Transmission Tower Line corridor. The larger parcel is 236.42± acres, is irregular in shape and has access via Oro Dam Boulevard East. Additionally, the property is located in flood zone X. However, the property is situated on a hillside and is significantly sloping and also lacks utilities to the site. According to the U.S.D.A. Natural Resources Conservation Service, the non-irrigated soils are entirely Class VII. Given the public use nature of the subject's zoning & GP, the highest and best use of public lands is for the most likely alternative use if it were not for public use. This is essentially similar to the ATF (Across the Fence) Methodology which is used for corridor valuations. Based on the location in Butte County and surrounding land uses and zoning, the highest and best use of the subject property would most likely be for rural residential use, consistent with the most likely zoning and general plan designation of Very Low Density Residential (VLDR) and immediately surrounding land uses. This alternative zoning of VLDR was the basis for our selection of comparable sales.

The three accepted approaches to value are the Sales Comparison Approach, the Income Approach (capitalization analysis) and the Cost Approach (reproduction or replacement cost analysis). We have utilized the Sales Comparison Approach to value as the best indication of fair market value to estimate the value of the land. Typically, the Income Approach and Cost Approach are not considered to be applicable to this appraisal problem because these are not typical approaches employed to estimate the value of similar vacant commercially zoned properties. Therefore, the Sales Comparison Approach will be solely relied upon in the determination of land value.

The State of California, Department of Water Resources is proposing to acquire a permanent tower line easement as well as two underground cable easements. The proposed 25.54-acre tower line easement is approximately 300 feet wide and cuts diagonally across the subject parcels in a "V" shape. The proposed 0.22-acre permanent underground cable easement is 20 feet wide, is relatively short and is situated just north of Oro Dam Boulevard and the proposed tower line easement. The other proposed 0.07-acre permanent underground cable easement is 10 feet wide, is also relatively short and is situated just north of the 0.22-acre cable easement.

VALUATION OF THE LARGER PARCEL

The Sales Comparison Approach compares the subject property to other similar rural residential properties that have recently sold in the market area. This is usually the preferred method of valuation when comparable sales data are available. The comparable sales are compared to the subject and analyzed based on the appraiser's knowledge of market behavior, in order to derive an indication of fair market value. All sale properties were compared based on a price per acre basis, consistent with the market.

Effort was made to find sales within close proximity to the subject property with similar qualities and characteristics. There was limited recent sales data in the subject's immediate Butte County market area. Therefore, we had to expand our geographic search parameters to include similar surrounding rural areas including both Yuba and Nevada County.

A summary of the comparable sales will be introduced in the table on the following page to establish the fair market value of the subject property.

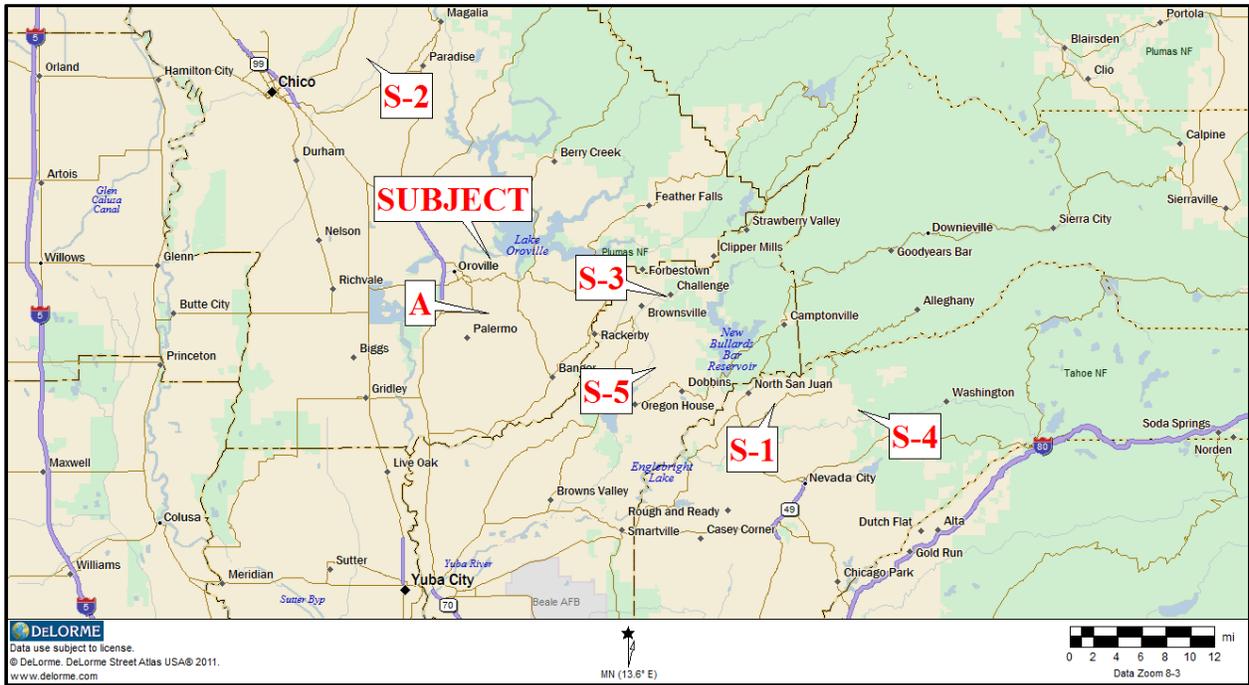
Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property

COMPARABLE LAND SALES SUMMARY

Sale # BRI #	Property Address APN(s)	Seller Buyer	Sale Date Doc #	Sale Price	Zoning	Size (Acres)	Price / Acre
<u>S-1</u> 2669	13452 Tyler Foote Rd <u>Nevada City, CA</u> APN: 62-010-28	<u>Landwrx LLC</u> Shaun & Marin Bryars	<u>12/22/2017</u> 0028703	\$330,000	AG-20	94.97	\$3,475
<u>S-2</u> 2675	Doe Mill & Zinfandel Rd. <u>Chico, CA</u> APN: 017-090-098	Allison Leanna <u>Lester</u> Nicholas Jenkins	<u>09/28/2017</u> 0034859	\$85,000	FR-40	39.58	\$2,148
<u>S-3</u> 2667	LaPorte Road, Challenge- <u>Brownsville, CA</u> APN: 050-110-028	<u>Hardie Family Trust</u> Christiane Nicole Muller	<u>03/24/2017</u> 003484	\$147,000	RE	25.37	\$5,794
<u>S-4</u> 2671	20619 N Bloomfield Rd <u>Nevada City, CA</u> APNs: 03-360-04, -05	<u>Thomas Family Trust</u> Sheffield Properties and Investments, LLC	<u>06/17/2016</u> 0012960	\$500,000	FR-160	426.27	\$1,173
<u>S-5</u> 2674	15171 Vavassuer Way <u>Dobbins, CA</u> APN: 060-100-026	2014 Barrington <u>Revocable Trust</u> Paul Petersen & Thomas Petersen	<u>04/15/2016</u> 004360	\$140,000	AR-10	40.59	\$3,449
Subject	NEQ of Oro Dam Boulevard East and Rusty Dusty Road <u>Butte County, CA</u> APNs: 033-010-055 & 069-010-019	-----	-----	-----	VLDR*	236.42	-----

**Most likely alternative zoning given the public use nature of the subject.*

COMPARABLE SALES MAP



LAND SALE DISCUSSION / COMPARISON TO SUBJECT PROPERTY

The factors considered for the comparable sales include property rights conveyed, financing terms, conditions of sale, expenditures after sale, market conditions, and physical characteristics such as location, accessibility, size, topography, water availability/quality, soil quality and site utility.

Unless noted, the comparable sales were arm's length, fee-simple transactions that were not affected by special conditions or atypical financing.

Comparable Land Sale 1. This is the sale of 94.97 acres of rural land located at the corner of Oak Tree road and Tyler Foote Crossing, listed under the address of Lot 5 Purdon Road, in Nevada County, California. The property sold in December of 2017 for \$330,000, or \$3,475 per acre. The sale was an all-cash transaction. The buyer reported that the property was densely covered in brush trees and was not developable, although electricity was to the site and the property had a domestic well when it sold. The buyer reported that there were no unusual sale conditions and that they were not sure yet what their plan for the site is. The property is access by a driveway off Tyler Foote Road and Purdon Road. The property is irregularly shaped and lies



within a flood zone X (unshaded). The topography of the property is sloping, with steeper topography seen on the western side along Oak Tree Road. The property consists of soils with a weighted irrigated capability class of 6.67. It is noted that the same parcel sold previously in March of 2017 for \$315,000, or \$3,317 per acre. The broker of the March sale reported that the property had access to electricity off Tyler Foote Road and that there was a manufactured home on the site located at the northern end of the parcel. However, the broker reported that the property sold for land value only. The property also had an older well on site which had not been tested and reportedly did not contribute any value to the sale price. The broker noted that the topography of the property at the western side, along Oak Tree road, was steep and the land in that area was very densely wooded. The broker was unsure as to what the buyers intended to do with the property but noted that the buyers had also purchased five other parcels during the same time.

This property is similar to the subject in terms of zoning, shape, topography, frontage/access, size and flood zone. However, the utilities are somewhat superior. This is more than offset by the remote location in Nevada County. Overall, this comparable is somewhat inferior and indicates a land value above \$3,475 per acre for the subject.



Comparable Land Sale 2. This is the sale of a 39.58-acre vacant rural residential property located off Doe Mill Rd, near Chico, California. The property sold on September 28, 2017 for \$85,000 or \$2,148 per acre. According to the listing agent the transaction was all cash. The broker noted that significant debris on the property affected the sale price and the buyer paid to clean up the debris after the sale. The broker was not aware of the buyers intended use of the property. The property does not have any utilities and is accessed via a rough and steeply sloping gravel road. The parcel is zoned FR-40, Foothill Residential and has a general plan designation of Vacant. The property is square in shape and is located within flood zone X

(unshaded). The topography of the parcel is flat and there are several good build sites if utilities are brought in. The property consists of 99.2% Class III irrigated soils.

This property is similar to the subject in terms of having no utilities to the site and with regards to flood zone and the zoning. Although the square shape is superior, the topography is generally level and the property size is relatively small, the remote location in eastern Chico is far inferior. Additionally, access to the parcel is via a rough and steeply sloping road is also significantly inferior to the subject in this regard. Furthermore, the property required an expenditure after the sale as the buyer had to pay to clean up and remove all of the debris on the property. Overall, the inferior attributes more than outweigh the superior attributes and suggests a land value above \$2,148 per acre.

Comparable Land Sale 3. This is the sale of a 25.37-acre vacant rural residential property located off LaPorte Road, near Challenge, California. The property sold on March 24, 2017 for \$147,000, or \$5,794 per acre. According to the listing agent the sale was seller financed. The seller financing did not have an effect on the sale price. The broker reported that there were no other unusual sale conditions involved in the transaction. The property sold with a tentative map to subdivide the parcel into five lots. However, the broker reported that this map had only been drafted and had not been submitted to the county at the time of sale. The buyer intends to build a residence on the property. The broker reported that the site had several good build sites and there was power and water at the roadway nearby. The property did not have a septic system installed at the time of



sale. The seller had previously installed a gravel road for access to the property. The property has a sloping topography and is covered with mature oaks and pine trees throughout the site. The property is irregular in shape and is located within flood zone X (unshaded). The property consists of 94.8% Class II irrigated soils.

This property is similar to the subject in terms of zoning, shape, topography, frontage/access and flood zone. However, the property size at 25 acres is significantly smaller than the subject property. Additionally, there are available utilities in close proximity and is slightly superior to the subject in this regard. Furthermore, there was a tentative map to subdivide the parcel into five lots and is superior in this regard. This is only slightly tempered by the inferior location approximately 20 miles east of Oroville near Challenge. Overall this comparable is considered superior to the subject and warrants a land value well below \$5,794 per acre.



Comparable Land Sale 4. This is the sale of two parcels totaling 426.27 acres of rural residential property off Bloomfield Road near Nevada City, California. The larger parcel is made up of one 422.08-acre site with direct access from the road and one 4.19-acre parcel located southeast of the major parcel, intersected by Malakoff Diggins State Park land. The two parcels sold for a total of \$500,000 on June 17, 2016. The broker indicated that the transaction was restricted to cash-only offers which narrowed the potential market of buyers. According to the broker, the buyer intended to build a residence on the large secluded property. The property did not have any utilities at the time of sale, although electric was located near the main road. The broker also indicated that there

were a few access roads throughout the property created from logging operations in the past. Access to the property was through a secured gate with a private driveway leading into the property. The property is zoned FR-160, Forest with heavy tree cover throughout the entire property. The property is irregularly shaped with some hilly topography. The property is located in a flood zone X (unshaded) with 65.7% Class VI irrigated soils.

This property is similar to the subject in terms of zoning, shape, topography, lack of utilities, frontage/access and flood zone. However, the highly remote location in Nevada County is far inferior. Additionally, the size at 426.27 acres is almost twice the size of the subject. Furthermore, the two parcels are not contiguous and are inferior in this regard. Overall this comparable is considered far inferior to the subject and warrants a land value well above \$1,173 per acre for the subject.

Comparable Land Sale 5. This is the sale of a 40.59-acre rural land site located off Vavassuer Way, near Dobbins, California. The property sold in April of 2016 for \$140,000, or \$3,449 per acre. The listing broker reported that the property sold slightly below market due to some seller motivation. The sale was owner financed, however the buyer paid off the loan very quickly and this financing condition did not have an effect on the sale price. The listing broker reported that the property was improved with a small outhouse, a shed with a generator, and a well with a solar pump. The generator was in unknown condition at the time of sale and the well had not been tested prior to the sale. The broker reported that these improvements did not contribute a particular value to the sale price due to the unknown condition. The property is sloping in topography and is covered with oaks and other mature trees throughout the site. The broker reported that there were some potential good view sites. However, the broker felt that the property would not be a good location for a residence due to its extremely remote location and rough access road. The broker believes that the buyers intended on clearing portions of the site to grow crops on the property. The property consists of an unspecified class of irrigated soils, and 100% Class VI non-irrigated soils. The property is located in a flood zone X (unshaded) and has sloping topography.



This property is similar to the subject in terms of having no utilities to the site and with regards to flood zone, topography and the zoning. This comparable sale is slightly superior in terms of its nearly rectangular shape. Additionally, the property size at approximately 40 acres is somewhat smaller than the subject property. Conversely, the remote location approximately 20 miles east of Oroville near Dobbins is far inferior. Additionally, access to the parcel is via a rough and steeply sloping road is also significantly inferior to the subject in this regard. Overall, the inferior attributes outweigh the slightly superior characteristics and warrants a land value somewhat above \$3,449 per acre.

Additional Market Data A. This is the pending sale of a 346-acre rural residential property. The property is located off Lower Wyandotte Road in Oroville, California and is currently in escrow, with plans to close by March 10 of 2018. The reported contract price is \$1,925,000, or \$5,563 per acre. The broker reported that the sale will be seller financed with 60% down and 40% financed over a one-year term. The financing did not have an effect on the contracted price. The broker reported that the property was improved with a hay barn, an equipment storage building, and a horse barn. The broker approximated an allocated value of \$150,000 to these improvements from the sale price. This represents an allocated price of \$1,775,000 or \$5,130* per acre for the land only.



The property consists of several parcels which total 346 acres. The property can be accessed via Lower Wyandotte road and is gated at that access point. The property can also be accessed via Lorene Court, which stems from Alverda Drive, behind the Feather Falls Casino. A majority of the property (300 acres) is zoned rural residential use with 5-acre minimums, however, the other 46 acres of the property is zoned for Medium Density Residential use, with up to six lots per acre. The broker reported that the entitlements to split the parcels elevated the value by approximately \$1,000 per acre in this market area. The property has access to electricity and receives a small amount of water from the South Feather Water and Power District. The property is irregular in shape and is located within flood zone X (unshaded). The topography of the parcel is rolling hills with grasslands. The soils consist of a weighted soil class average of 4.5, with 70.9% Class IV, 2.9% Class III, and 26% Class VI. The buyer intends to use the property for agricultural use and hold the land for future development to residential lots.

The comparable sales indicate a value range from \$1,173 to \$5,794 and after qualitative comparisons, provide a bracketed range for the subject from approximately \$3,475 to \$5,794 per acre as follows.

Comparable	Indicated Price / Acre
S-3	<\$5,794
<i>Estimated subject's range \$3,475 to \$5,794 per acre</i>	
S-1	>\$3,475
S-5	>\$3,449
S-2	>\$2,148
S-4	>\$1,173

Sale 3 brackets the upper end of the range and is clearly superior to the subject in regard to size, utilities and having a tentative map. Conversely, Sale 1 is clearly inferior in terms of the remote location in Nevada County and brackets the low end of the range for the subject property. Therefore, placing greatest weight on Sales 1 and 3, with support from the rest of the data set, we have concluded a value for the subject's land at **\$4,500 per acre**.

The additional market data of the 346-acre pending sale with an allocated price of \$1,775,000 or \$5,130* per acre for the land only in Oroville further supports our conclusion of value as a portion of this property is zoned for medium density residential zoning and given the location adjacent to Feather Falls Casino and utilities to the site.

LARGER PARCEL VALUATION

The fair market value of the subject larger parcel is estimated as follows:

$$236.42\pm \text{ Acres} \times \$4,500/\text{AC} = \$ 1,063,890$$

VALUE OF PROPOSED ACQUISITION

The value of the proposed acquisition is the contributory value of land and improvements within the portion to be acquired of the larger parcel. This includes land (fee, all easements, except TCE's) and improvements located in the area of the acquisition.

As previously mentioned in this report, the existing roadway (Oro Dam Blvd) bisects the subject property and heavily encumbers the fee simple rights within this area. Given the limited use and enjoyment of this area, it is concluded that the existing roadway encumbers almost 100% of the fee value. Therefore, we have concluded there is a \$1 remaining fee value where a roadway exists. Based on the appraiser's aerial measurements, the area of the proposed easement that is within the existing roadway totals approximately 2.06 acres.

As previously discussed in the easement analyses, based on the draft easement language which allows for aboveground and belowground utilities, the removal of trees as well as access; we have concluded that the proposed easements will encumber 75% of the fee value with 25% remaining fee value within these areas. This appraisal assumes that the proposed easement will have language similar and no more restrictive than the draft easement document provided by DWR, included within the addenda of this report (see extraordinary assumption #3).

The area being acquired is in permanent easement and consists of vacant land and public roadway (Oro Dam Blvd). The permanent easement acquisition is valued based on 75% of the fee value.

The proposed acquisition is summarized as follows:

Tower Line Easement Acquisition ORO-699, Unit A: 25.54± Acres:

Unencumbered			
23.48± Acres x \$4,500/acre x 75%	=	\$	79,245
Area Encumbered by a roadway (Oro Dam Blvd):			
2.06± Acres		\$	1
Sub-total:		\$	79,246

Underground Cable Easement Acquisition ORO-699, Unit B: 0.22± Acres:

0.22± Acres x \$4,500/acre x 75%	=	\$	743
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Underground Cable Easement Acquisition ORO-699, Unit C: 0.07± Acres:

0.07± Acres x \$4,500/acre x 75%	=	\$	236
Total		\$	80,225

VALUE OF THE REMAINDER AS PART OF LARGER PARCEL

The value of the portion of land and improvements, not required for the project, is called the remainder parcel. The value of the remainder land and improvements is their contributory value to the larger parcel without consideration of damages or benefits.

Larger Parcel	less	Proposed Acquisition	Remainder
\$1,063,890	-	\$80,225	= \$ 983,665

VALUE OF THE REMAINDER AFTER ACQUISITION, (BEFORE CONSIDERATION OF BENEFITS)

The appraisal process requires valuation of the remainder parcel as a separate and distinct parcel considering all the market forces that indicate a diminution in value to the remainder property. The Sales Comparison Approach was utilized to estimate the value of the remainder. The loss in the area required for the project does not significantly reduce the value of the remainder. The construction of the Oroville Spillway Emergency Recovery Transmission Line Relocation Project will not significantly alter the utility or desirability such that there is a diminution in the value of the remainder.

Market Value of the Remainder:	\$ 983,665
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Severance Damages. The value of the remainder as part of the larger parcel is compared to the value of the remainder as a separate parcel after acquisition to estimate the loss in value to the remainder as a measure of severance damages. There are no severance damages as a result of the project.

Value of Remainder before Acquisition		\$ 983,665
Less: Value of Remainder after Acquisition	-	\$ 983,665
Loss in Market Value		\$ 0

VALUE OF REMAINDER AFTER ACQUISITION CONSIDERING BENEFITS

The appraisal process requires the valuation of the remainder as a separate and distinct parcel considering all the market forces that indicate any increase in value to the remainder property(s). The value of the remainder after acquisition considering benefits is as follows:

\$ 983,665

Benefits. Land is being taken for the Oroville Spillway Emergency Recovery Transmission Line Relocation Project. Although the project intent is to provide a benefit to the state, no direct quantifiable benefits are determined for the subject property. There are no benefits from this project for the subject property.

Remainder after Acquisition Considering Benefits		\$ 983,665
Less: Remainder after Acquisition Before Considering Benefits	-	\$ 983,665
Gain in Market Value		\$ 0

Net Severance Damages		\$ 0
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FAIR MARKET VALUE ESTIMATE

Market Value of the Acquisition		
Proposed Acquisition		\$ 80,225
Net Severance Damages		\$ 0
Temporary Construction Easement		\$ 0
Total		\$ 80,225

Rounded		\$ 80,300
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In our opinion, this is the value that should be considered for compensation purposes. This concludes the appraisal report.

ADDENDA

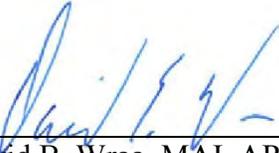
ITEM 1
APPRAISERS' CERTIFICATIONS

APPRAISER'S CERTIFICATION

I certify that, to the best of my knowledge and belief:

1. I have not personally inspected the subject property herein appraised, but I have afforded the property owner, or his designated representative, the opportunity to accompany us at the time of inspection.
2. To the best of my knowledge and belief the statements of fact contained in this appraisal report are true and the information upon which the opinions expressed therein as based is correct, subject to the assumptions and limiting conditions set forth in the appraisal.
3. I understand that such appraisal is to be used in connection with the acquisition of the subject property by the Department of Water Resources.
4. The analyses, opinions, and conclusions contained in this report are our personal, impartial, unbiased and professional analyses, opinions and conclusions, and are limited only by the reported assumptions and limiting conditions of this report.
5. This appraisal has been made in conformity with the appropriate State laws, Title VI of the 1964 Civil Rights Act, regulations and policies and procedures applicable to eminent domain real estate appraisals, and, that to the best of my knowledge, no portion of the value assigned to such properties consists of items which are non-compensable under established law of California.
6. Our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformance with the requirements of the Code of Professional Ethics and the Standards of Professional Practice of the Appraisal Institute, which fully incorporate the Uniform Standards of Professional Appraisal Practice (USPAP) of the Appraisal Foundation.
7. We have no present or prospective interest in the property that is the subject of this report, and we have no personal interest or bias with respect to the parties involved.
8. We have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
9. Our compensation is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
10. The out-of-context quoting from, or partial reprinting of, this report is not authorized.
11. We have not revealed the findings and/or results of this appraisal to anyone other than the proper officials of the Department of Water Resources, and we will not do so until so authorized by DWR, or until I am required to do so by due process of law, or until I am relieved of this obligation by having publicly testified as to such findings.

12. David B. Wraa is a Certified General Appraiser in the State of California.
13. As of the date of this report, I, David B. Wraa, MAI, ARA, AI-GRS have completed the requirements of the continuing education program of the Appraisal Institute.
14. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
15. I have not provided appraisal services on this property within the last three years.
16. Alysia Corey (née Ballantyne) provided significant assistance in the preparation of this report including: determination of the appraisal problem, market research, collection and analysis of the data, and valuation analysis under the direct supervision of the undersigned.



David B. Wraa, MAI, ARA, AI-GRS
Certified General Real Estate Appraiser
California Certificate No. AG023713

APPRAISER'S CERTIFICATION

I certify that, to the best of my knowledge and belief:

1. I have personally inspected the subject property herein appraised and afforded the property owner, or his designated representative, the opportunity to accompany us at the time of inspection.
2. To the best of my knowledge and belief the statements of fact contained in this appraisal report are true and the information upon which the opinions expressed therein as based is correct, subject to the assumptions and limiting conditions set forth in the appraisal.
3. I understand that such appraisal is to be used in connection with the acquisition of the subject property by the Department of Water Resources.
4. The analyses, opinions, and conclusions contained in this report are our personal, impartial, unbiased and professional analyses, opinions and conclusions, and are limited only by the reported assumptions and limiting conditions of this report.
5. This appraisal has been made in conformity with the appropriate State laws, Title VI of the 1964 Civil Rights Act, regulations and policies and procedures applicable to eminent domain real estate appraisals, and, that to the best of my knowledge, no portion of the value assigned to such properties consists of items which are non-compensable under established law of California.
6. Our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformance with the requirements of the Code of Professional Ethics and the Standards of Professional Practice of the Appraisal Institute, which fully incorporate the Uniform Standards of Professional Appraisal Practice (USPAP) of the Appraisal Foundation.
7. We have no present or prospective interest in the property that is the subject of this report, and we have no personal interest or bias with respect to the parties involved.
8. We have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
9. Our compensation is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
10. The out-of-context quoting from, or partial reprinting of, this report is not authorized.

11. We have not revealed the findings and/or results of this appraisal to anyone other than the proper officials of the Department of Water Resources, and we will not do so until so authorized by DWR, or until I am required to do so by due process of law, or until I am relieved of this obligation by having publicly testified as to such findings.
12. Kelli N. Johnson is a Certified General Appraiser in the State of California.
13. As of the date of this report, I, Kelli Johnson, have completed the Standards and Ethics Education Requirements for Candidates/Practicing Affiliates of the Appraisal Institute.
14. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
15. I have not provided any appraisal services on this property within the last three years.
16. Alysia Corey (née Ballantyne) provided significant assistance in the preparation of this report including: determination of the appraisal problem, market research, collection and analysis of the data, and valuation analysis under the direct supervision of the undersigned.



Kelli N. Johnson
Certified General Real Estate Appraiser
California Certificate No. AG043915

ITEM 2
SUBJECT PROPERTY PHOTOGRAPHS

SUBJECT PROPERTY PHOTOGRAPHS



View of the tower transmission lines/easement area from the Northwest corner of the subject property looking Southwest.



View of the tower transmission lines/easement area from the Northwest corner of the subject property looking Southwest.

SUBJECT PROPERTY PHOTOGRAPHS



View of the tower transmission lines/easement area from the Northwest corner of the subject property looking Northwest.



View of the tower transmission lines/easement area from the Northwest corner of the subject property looking Northwest.

SUBJECT PROPERTY PHOTOGRAPHS



View of the tower transmission lines/easement area from the middle of the subject property looking Northwest.

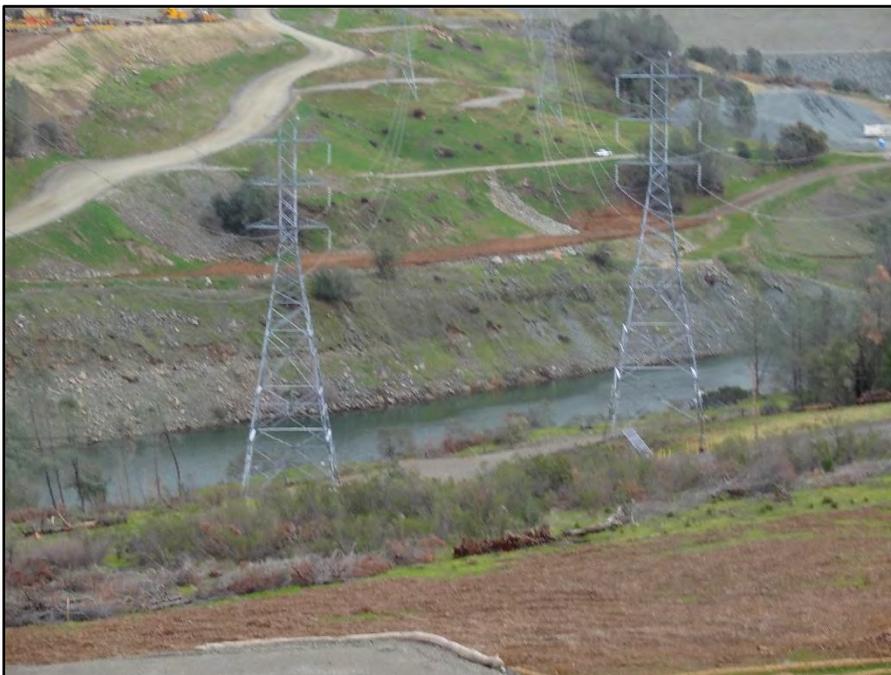


View of the tower transmission lines/easement area from the middle of the subject property looking Southeast.

SUBJECT PROPERTY PHOTOGRAPHS



View of the tower transmission lines/easement area from the middle of the subject property looking Northeast (Oroville Dam in the background).



View of the tower transmission lines/easement area from the middle of the subject property looking Northeast.

SUBJECT PROPERTY PHOTOGRAPHS



Oro Dam Boulevard East looking East.



Oro Dam Boulevard East looking South.

ITEM 3

LEGAL DESCRIPTION AND APPRAISAL MAPS

Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Division of Engineering
INTEROFFICE TRANSMITTAL

To: Bradley Johnson

Date: December 21, 2017

Project: Oroville Recovery Project
DWR 230 kV Relocation

Subject: Revised Description for PG&E

Division: DOE
REB

Parcel Number: ORO-699

Transmitted herewith are:

- 1. Grant Deeds
- 2. Permanent Easements
- 3. Temporary Easements
- 4. Quitclaim Deeds
- 5. Partial Reconveyance Under Trust Deed
- 6. Partial Release of Mortgage
- 7. Subordination Agreements
- 8. Director's Easement Deed
or
Reclamation Board Deeds

- 9. Director's Deed
or
Reclamation Board Deed
- 10. Legal Description
- 11. Title Report
- 12. Parcel Sketches
- 13. Appraisal maps
- 14. Suit Maps
- 15. Resolution Maps
- 16. Property Tabulations
- 17. Exhibit Drawing

REMARKS:

Brad,

Please find the revised description for the PG&E acquisition as you requested. This description is draft, it will be sent to PG&E (Eric Finley) for review. A pdf of the legal description, exhibit plat, appraisal map & transmittal will be sent to you via email attachment, please copy me if this package is distributed in the future.

Please call Bob Chesner or me if you have questions.

Thank You

C.C.# Q.6410.7000.002
Control No. 2017-0012
cc: Bob Chesner

Albert De Leon, Cadastral Surveys and
Land Records Unit

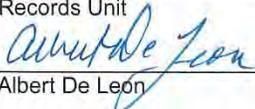
By 
Albert De Leon

EXHIBIT B

ORO-699

All that real property being portions of Sections 2, and 3, Township 19 North, Range 4 East, M.D.M., County of Butte, State of California, being portions of land described in the deed recorded on November 24, 1917 and in Book 153 of Deeds, Page 54 and the deed recorded on June 18, 1932 in Book 91 of Official Records, Page 446, Official Records of said county, described as follows:

TOWER LINE EASEMENT AREA
UNIT A

COMMENCING at a found 3/4" Iron Pipe with Plug marked "ORO-28" shown upon the Department of Water Resources Property Management Drawing Number 04-38 approved on January 18, 1963 and last revised on April 25, 2001, as marking the northerly terminus of a course in the westerly line of PARCEL A, as said PARCEL A is described in the deed recorded January 18, 1963 in Book 1222 of Official Records, Page 462, Official Records of said county, from which a found 3/4" Iron Pipe with Plug marked "ORO-29" shown on said Drawing Number 04-38, marking the westerly terminus of a course in the northerly line of PARCEL B, as said PARCEL B is described in said deed recorded January 18, 1963, bears North 87° 32' 41" West 1214.06 feet, thence along last said westerly line South 03° 52' 19" East 1852.28 feet to a found 3/4" Iron Pipe with Plug Cap marked "ORO-47" shown upon the Department of Water Resources Property Management Drawing Number 04-50 approved on April 17, 2001 and last revised on March 19, 2001 and the Point of Beginning; THENCE FROM SAID POINT OF BEGINNING along the easterly line of said PARCEL B South 14° 48' 00" East 515.59 feet; thence the following three (3) courses and leaving said line:

- (1) South 38° 45' 40" East 1659.37 feet;
- (2) South 48° 00' 51" East 908.94 feet; and
- (3) North 68° 47' 02" East 1239.46 feet to the southerly line of said PARCEL A

thence along last said southerly line North 56° 57' 55" West 358.40 feet; thence the following four (4) courses and leaving said line:

- (1) South 69° 05' 47" West 830.94 feet;
- (2) North 47° 44' 35" West 798.33 feet;
- (3) North 39° 26' 40" West 651.30' to the herein described POINT A; and
- (4) North 39° 26' 40" West 1154.91 feet to the southerly line of said PARCEL A

thence along last said southerly line North 56° 57' 55" West 222.53 feet to the point of beginning.

Containing 25.54 acres, more or less.

UNDERGROUND CABLE EASEMENT AREA
UNIT B

A strip of land 20.00 feet in width lying 10.00 feet left and 10.00 feet right, measured at right angles, on each side of the following described centerline

BEGINNING at the hereinabove described Point A, thence from said POINT OF BEGINNING the following four (4) courses and leaving the Northeasterly line of hereinbefore described UNIT A;

- 1) South 83° 42' 04" East 139.98 feet;
- 2) South 76° 07' 37" East 160.10 feet;
- 3) North 85° 56' 57" East 142.83 feet; and
- 4) South 61° 01' 14" East 100.68 feet to the Southwesterly line of the parcel of land described and designated ORO-690 Unit A described in the EASEMENT recorded August 26, 1988 as Instrument No. 88-028654.

The sidelines of said strip shall be lengthened or shortened to extending from the Northeasterly line of hereinbefore described UNIT A to the Southwesterly line of said EASEMENT recorded August 26, 1988.

EXCEPTING therefrom all that portion of said Oro Dam Boulevard.

Containing 0.22 acres, more or less.

UNIT C

A strip of land 10.00 feet in width lying 5.00 feet left and 5.00 feet right, measured at right angles, on each side of the following described centerline

COMMENCING at the hereinabove described POINT A;
thence along the northeasterly line of the hereinabove described UNIT A
North 39° 26' 40" West 239.35 feet to an existing fiber optic cable and the point of beginning;

THENCE FROM SAID POINT OF BEGINNING and leaving the northeasterly line of the hereinabove described UNIT A and along said centerline and said existing fiber optic cable the following two (2) courses:

- 1) North 41° 59' 02" East 36.87 feet; and
- 2) North 60° 18' 25" East 269.13 feet to the southerly line of said PARCEL A.

The sidelines of said strip shall be lengthened or shortened to extending from the Northeasterly line of hereinbefore described UNIT A to the southerly line of said PARCEL A.

Containing 0.07 acres, more or less.

**Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property**

Bearings and distances used in the above description are based on the California Coordinate System, CCS83 Epoch 2010.00 (2011 Realization), Zone 2, US Survey Feet. The above distances are grid, to convert to Ground multiply by 1.00008234.

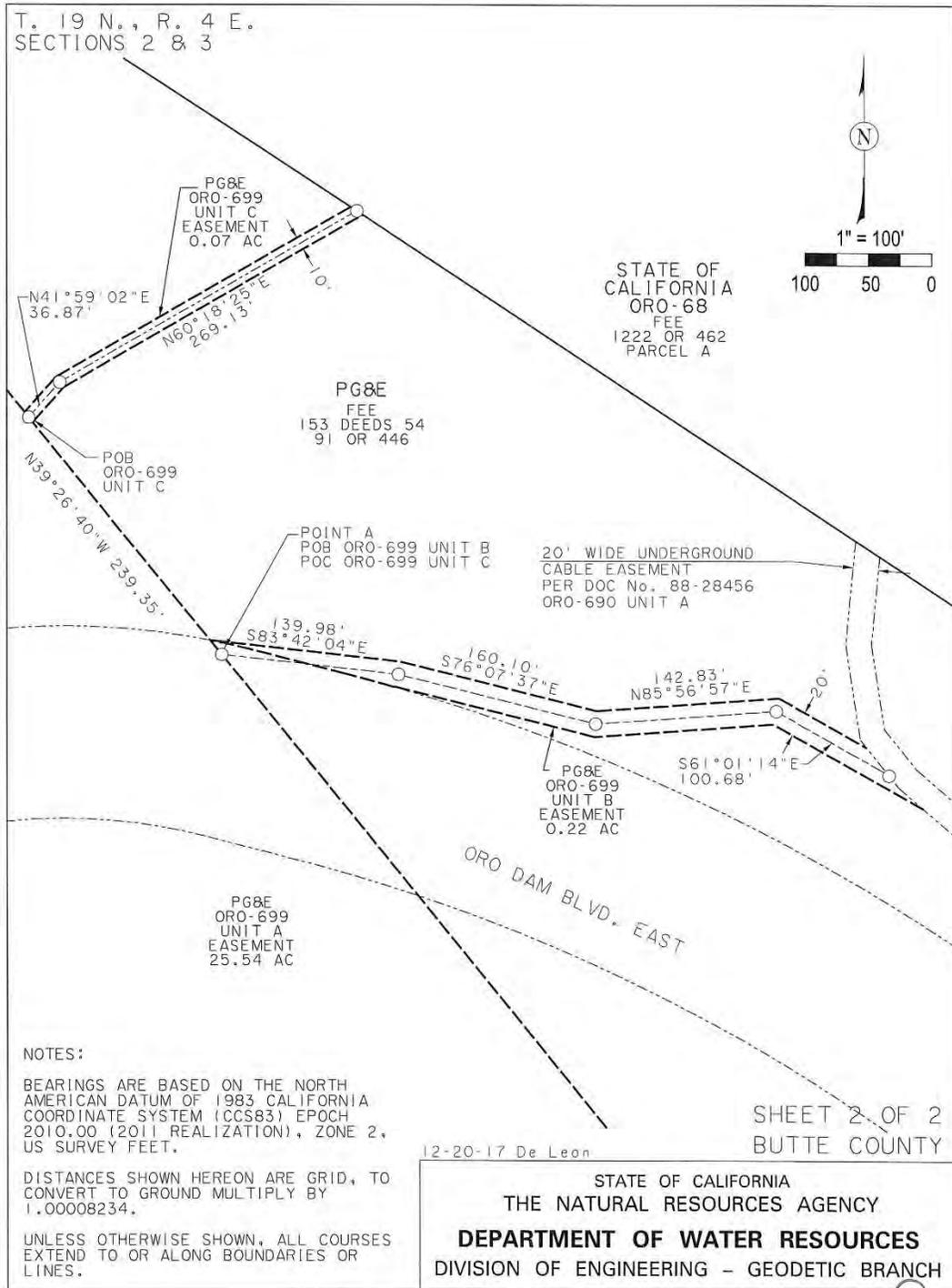


Draft

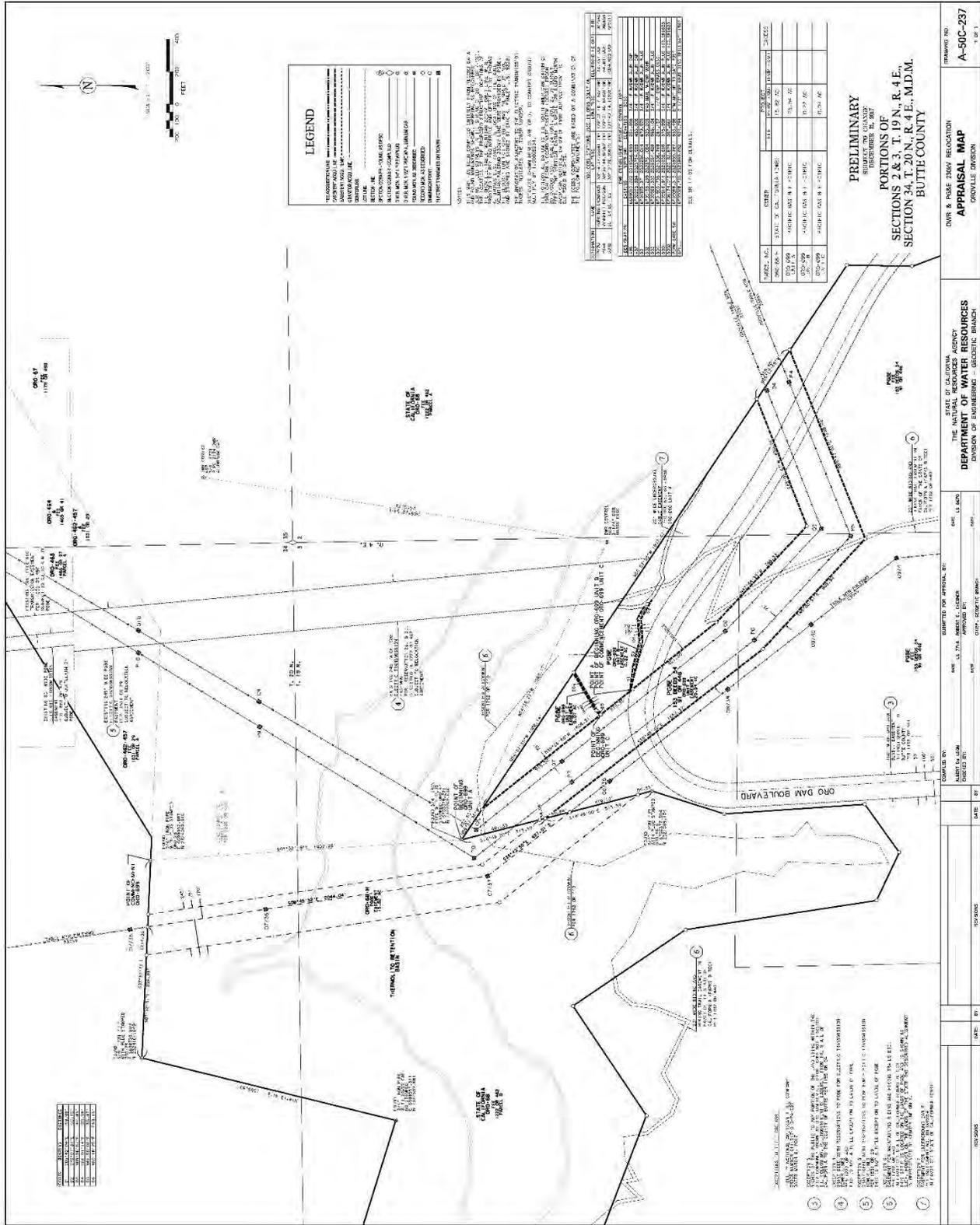
Albert De Leon LS 7716

for Review

Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property



Oroville Spillway Transmission Line Relocation Project
 Butte County, California
 PG&E Property



BRI 17-267

BENDER ROSENTHAL, INC.

ITEM 4
EASEMENT AGREEMENT

LD 2119-04-1694
JCN: 06-17-010
DWR Easement (Oroville-Table Mtn 230kV)
RECORDING REQUESTED BY, AND
WHEN RECORDED RETURN TO:

PACIFIC GAS AND ELECTRIC COMPANY
245 Market Street, N10A, Room 1015
P.O. Box 770000
San Francisco, California 94177

Location: County of Butte
Recording Fee \$ 0.00
Document Transfer Tax \$ 0.00
o Computed on Full Value of Property Conveyed, or
o Computed on Full Value Less Liens &
Encumbrances Remaining at Time of Sale]

Signature of declarant or agent determining tax

(A portion of APN 033-010-055 & 069-010-019)

**EASEMENT AGREEMENT
(Electric Transmission 230kV)**

This Easement Agreement (“**Agreement**”) is made and entered into this _____ day of _____, 200__ (the “**Effective Date**”) by PACIFIC GAS AND ELECTRIC COMPANY, a California corporation, hereinafter called “**PG&E**”, and the STATE OF CALIFORNIA, acting by and through its Director of Water Resources, hereinafter called “**Grantee.**”

RECITALS

A. PG&E owns certain real property within the County of Butte, State of California, commonly known as Assessor’s Parcel Numbers 033-010-055 & 069-010-019, and more particularly described in **Exhibit A**, attached hereto and made a part hereof (hereinafter, the “**Property**”).

B. Grantee proposes to reroute their Oroville – Table Mountain 230kV tower lines, and in connection therewith, Grantee has requested that PG&E grant an easement for two (2) electric tower lines and two (2) underground electric and communication conduits.

C. PG&E is willing to grant such easement on the terms and subject to the conditions set forth herein.

Now, therefore, for good and valuable consideration, PG&E and Grantee agree as follows:

1. Grant of Easement: PG&E hereby grants to Grantee, upon the terms and conditions set forth in this Agreement, the following easement:

(a) A non-exclusive right to construct, install, suspend, repair, replace, remove, maintain and use two (2) 230kV electrical transmission lines, each consisting of wires and cables suspended from poles, towers, or other structures; and two (2) underground conduits, pipes, manholes, service boxes, wires, cables and other electrical conductors; aboveground market posts, risers and service pedestals; underground and aboveground switches, fuses, terminals and transformers with associated concrete pads; and fixtures and appurtenances necessary to any thereof, for the transmission of electric energy and communication purposes; all within the portion of the Property (the "**Easement Area**") described in **Exhibit B** attached hereto and made a part hereof.

(b) The right, from time to time, to trim or to cut down any and all trees and brush now or hereafter within said easement area which now or hereafter in the opinion of Grantee may interfere with or be a hazard to the facilities installed hereunder, or as Grantee deems necessary to comply with applicable state or federal regulations;

(c) A non-exclusive right of surface access, ingress and egress to and from Grantee's facilities within the Easement Area, over and across the portion of the Property on which PG&E has constructed private roads and lanes thereon, if such there be, otherwise upon written request from Grantee, by such routes as PG&E determines, in its reasonable discretion, will occasion the least practicable damage and inconvenience to PG&E and its facilities.

2. Limitations on Use.

(a) The Easement Area, and any facilities permitted to be constructed thereon, are to be used by Grantee only for those uses permitted in Section 1 above, and for no other purpose.

(b) PG&E reserves the right to restrict access to the Easement Area or any portion or portions thereof in the event of fire, earthquake, storm, riot, civil disturbance, or other casualty or emergency, or in connection with PG&E's response thereto, or if emergency repairs or maintenance are required to PG&E facilities within or in the vicinity of the Easement Area, or otherwise when PG&E deems it advisable to do so, including in connection with events and emergencies occurring or affecting PG&E's business operations located elsewhere than in the immediate vicinity of the Property.

(c) This Agreement does not authorize the interconnection of Grantee's facilities with PG&E's facilities, which interconnection would be the subject of one or more separate written agreements between the parties, including, but not limited to, a Generator Interconnection Agreement and/or a retail power purchase agreement.

3. Condition of Easement Area. Grantee accepts the Easement Area in its existing physical condition, without warranty by PG&E or any duty or obligation on the part of PG&E to maintain the Easement Area. Grantee acknowledges that one or more of the following (collectively, "**Potential Environmental Hazards**") may be located in, on or underlying the Property and/or the Easement Area:

(a) electric fields, magnetic fields, electromagnetic fields, electromagnetic radiation, power frequency fields, and extremely low frequency fields, however designated, and whether emitted by electric transmission lines, other distribution equipment or otherwise (“EMFs”);

(b) Hazardous Substances (as hereinafter defined). For purposes hereof, the term “**Hazardous Substances**” means any hazardous or toxic material or waste which is or becomes regulated by Legal Requirements (as hereinafter defined) relating to the protection of human health or safety, or regulating or relating to industrial hygiene or environmental conditions, or the protection of the environment, or pollution or contamination of the air, soil, surface water or groundwater, including, but not limited to, laws, requirements and regulations pertaining to reporting, licensing, permitting, investigating and remediating emissions, discharges, releases or threatened releases of such substances into the air, surface water, or land, or relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of such substances. Without limiting the generality of the foregoing, the term Hazardous Substances includes any material or substance:

(1) now or hereafter defined as a “hazardous substance,” “hazardous waste,” “hazardous material,” “extremely hazardous waste,” “restricted hazardous waste” or “toxic substance” or words of similar import under any applicable local, state or federal law or under the regulations adopted or promulgated pursuant thereto, including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §§9601 et seq. (“CERCLA”); the Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§6901 et seq.; the Clean Air Act, 42 U.S.C. §§7401 et seq.; the Clean Water Act, 33 U.S.C. §§1251 et seq.; the Toxic Substance Control Act, 15 U.S.C. §§2601 et seq.; the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§136 et seq.; the Atomic Energy Act of 1954, 42 U.S.C. §§2014 et seq.; the Nuclear Waste Policy Act of 1982, 42 U.S.C. §§10101 et seq.; the California Hazardous Waste Control Law, Cal. Health and Safety Code §§25100 et seq.; the Porter-Cologne Water Quality Control Act, Cal. Water Code §§13000 et seq.; the Carpenter-Presley-Tanner Hazardous Substance Account Act (Health and Safety Code §§25300 et seq.); and the Medical Waste Management Act (Health and Safety Code §§25015 et seq.); or

(2) which is toxic, explosive, corrosive, flammable, infectious, radioactive, carcinogenic, mutagenic or otherwise hazardous, and is now or hereafter regulated as a Hazardous Substance by the United States, the State of California, any local governmental authority or any political subdivision thereof, or which cause, or are listed by the State of California as being known to the State of California to cause, cancer or reproductive toxicity; or

(3) the presence of which on the Property poses or threatens to pose a hazard to the health or safety of persons on or about the Property or to the environment; or

(4) which contains gasoline, diesel fuel or other petroleum hydrocarbons; or

(5) which contains lead-based paint or other lead contamination, polychlorinated biphenyls (“PCBs”) or asbestos or asbestos-containing materials or urea formaldehyde foam insulation; or

- (6) which contains radon gas;
- (c) fuel or chemical storage tanks, energized electrical conductors or equipment, or natural gas transmission or distribution pipelines; and
- (d) other potentially hazardous substances, materials, products or conditions.

Grantee shall be solely responsible for the health and safety of, and shall take all necessary precautions to protect, its employees, contractors, consultants, agents and invitees (“**Grantee’s Representatives**”) from risks of harm from Potential Environmental Hazards. Grantee acknowledges that it has previously evaluated the condition of the Easement Area and all matters affecting the suitability of the Easement Area for the uses permitted by this Agreement, including, but not limited to, the Potential Environmental Hazards listed herein.

4. Grantee’s Covenants. Grantee hereby covenants and agrees:

(a) Construction of Improvements. Grantee agrees to construct and install, at no cost to PG&E, such facilities and improvements (“**Improvements**”) as may be necessary and appropriate for Grantee’s permitted use, as specified in Section 1. All such construction shall be performed in accordance with detailed plans and specifications (“**Plans**”) previously approved by PG&E, and shall comply with all Legal Requirements. Before commencing construction of any Improvements, Grantee shall obtain all permits, authorizations or other approvals, at Grantee’s sole cost and expense as may be necessary for such construction. Without limiting the generality of the foregoing, Grantee shall be responsible for complying with any and all applicable requirements of the National Environmental Policy Act (“**NEPA**”) and the California Environmental Quality Act (“**CEQA**”) and satisfying, at Grantee’s sole expense, any and all mitigation measures under CEQA that may apply to Grantee’s proposed occupancy and use of the Easement Area, and to the construction, maintenance and use of Grantee’s proposed Improvements and facilities. Grantee shall promptly notify PG&E of any and all proposed mitigation measures that may affect PG&E or the Property. If PG&E determines in good faith that any such mitigation measures may adversely affect PG&E or the Property, or impose limitations on PG&E’s ability to use the Property as specified in Section 7, then PG&E shall have the right, without liability to Grantee, to give notice of termination of this Agreement to Grantee, whereupon this Agreement and the rights granted to Grantee shall terminate and revert in PG&E, unless within ten (10) days following delivery of such notice, Grantee gives notice to PG&E by which Grantee agrees to modify its proposed Project (as that term is defined under CEQA) so as to eliminate the necessity for such mitigation measures. In the event of such termination, PG&E and Grantee shall each be released from all obligations under this Agreement, except those which expressly survive termination. Grantee acknowledges and agrees that PG&E’s review of Grantee’s Plans is solely for the purpose of protecting PG&E’s interests, and shall not be deemed to create any liability of any kind on the part of PG&E, or to constitute a representation on the part of PG&E or any person consulted by PG&E in connection with such review that the Plans or the Improvements contemplated by such Plans are adequate or appropriate for any purpose, or comply with applicable Legal Requirements. Grantee shall not commence construction or installation of any Improvements without the prior written consent of PG&E, which consent shall not be unreasonably withheld, conditioned or delayed, and the prior consent, to the extent required by applicable law or regulation, of the California Public Utilities Commission (hereinafter, “**CPUC**”);

(b) Compliance with Laws. Grantee shall, at its sole cost and expense, promptly comply with (a) all laws, statutes, ordinances, rules, regulations, requirements or orders of municipal, state, and federal authorities now in force or that may later be in force, including, but not limited to, those relating to the generation, use, storage, handling, treatment, transportation or disposal of Hazardous Substances, as defined herein, or to health, safety, noise, environmental protection, air quality or water quality; (b) the conditions of any permit, occupancy certificate, license or other approval issued by public officers relating to Grantee's use or occupancy of the Easement Area; and (c) with any liens, encumbrances, easements, covenants, conditions, restrictions and servitudes (if any) of record, or of which Grantee has notice, which may be applicable to the Easement Area (collectively, "**Legal Requirements**"), regardless of when they become effective, insofar as they relate to the use or occupancy of the Easement Area by Grantee. Grantee shall furnish satisfactory evidence of such compliance upon request by PG&E. The judgment of any court of competent jurisdiction, or the admission of Grantee in any action or proceeding against Grantee, whether or not PG&E is a party in such action or proceeding, that Grantee has violated any Legal Requirement relating to the use or occupancy of the Easement Area, shall be conclusive of that fact as between PG&E and Grantee.

(c) Notice of Enforcement Proceedings. Grantee agrees to notify PG&E in writing within three (3) business days of any investigation, order or enforcement proceeding which in any way relates to the Property, or to any contamination or suspected contamination on, within or underlying the Property. Such notice shall include a complete copy of any order, complaint, agreement, or other document which may have been issued, executed or proposed, whether draft or final;

(d) Non-Interference. Grantee agrees not to interfere in any way or permit any interference with the use of the Property by PG&E and other entitled persons. Interference shall include, but not be limited to, any activity by Grantee that places any of PG&E's gas or electric facilities in violation of any of the provisions of General Order Nos. 95 (Overhead Electric), 112 (Gas), and 128 (Underground Electric) of the CPUC or to any other Legal Requirements under which the operations of utility facilities are controlled or regulated. Grantee shall not erect, handle, or operate any tools, machinery, apparatus, equipment, or materials closer to any of PG&E's high-voltage electric conductors than the minimum clearances set forth in the High-Voltage Electrical Safety Orders of the California Division of Industrial Safety; which minimum clearances are incorporated herein by reference; but in no event closer than ten (10) feet to any energized electric conductors or appliances. Grantee shall not drill, bore, or excavate within thirty (30) feet of any of PG&E's underground facilities, including, but not limited to, gas pipelines, valves, regulators or electric conduits. Grantee shall provide notice to Underground Service Alert at 1-800-227-2600 at least two (2) business days prior to commencing any drilling, boring or excavating permitted hereunder to assist Grantee with locating any and all underground facilities, including, but not limited to, gas pipelines, valves, regulators or electric conduits;

(e) Avoiding Dangerous Activities. Grantee agrees to conduct its activities and operations within and on the Easement Area in such a manner so as not to endanger the Property, PG&E's utility facilities, the environment and human health and safety. Grantee shall not cause or permit any Hazardous Substances, as defined herein, to be brought upon, produced, stored, used, discharged or disposed of on, or in the vicinity of the Property, except in compliance with all applicable Legal Requirements. Grantee shall be responsible for the cost of remediating any

discharge or release of Hazardous Substances resulting from or arising in connection with Grantee's use of the Property, and shall immediately notify PG&E and the appropriate regulatory authorities where required by law, of any such release. If PG&E determines that Grantee's activities in any way endanger the Property, PG&E's utility facilities, the environment, or human health and safety, PG&E may, in PG&E's sole and absolute discretion, require that Grantee halt such activities until appropriate protective measures are taken to PG&E's satisfaction. Grantee shall hold PG&E harmless from any claims resulting from any delay under this paragraph. PG&E's right to halt activities under this paragraph shall not in any way affect or alter Grantee's insurance or indemnity obligations under this Agreement, nor shall it relieve Grantee from any of its obligations hereunder that pertain to health, safety, or the protection of the environment;

(f) Maintenance. Grantee agrees to maintain its facilities and Improvements in good condition and repair, and be responsible for the security of, the facilities installed hereunder;

(g) Repairing Damage. Grantee agrees to repair any damage it may cause to PG&E's facilities and improvements in or around said Easement Area;

(h) Coordination. Grantee agrees to coordinate all activities regarding the easements granted herein to reasonably minimize any interference and inconvenience with the use by PG&E of the Easement Area and PG&E's adjoining lands;

(i) Fencing.

(1) Grantee agrees not to fence or enclose the Easement Area (except that Grantee may, with PG&E's permission, and Grantee will, upon PG&E's request, whenever construction work is being performed on, over or about the Easement Area, erect and maintain a temporary fence to surround and secure the area in which such work is being performed); and

(2) Grantee may, with PG&E's permission, install gates to restrict third party access over said roads, provided a PG&E lock is installed to allow unrestricted access to PG&E.

(j) PG&E Right to Cure. Grantee agrees that if Grantee fails to perform any act or other obligation on its part to be performed hereunder, and such failure is not remedied within fifteen (15) days following notice from PG&E (or in the case of an emergency, following such notice, if any, as may be reasonably practicable under the existing circumstances), PG&E may (but without obligation to do so, and without waiving or releasing Grantee from any of its obligations) perform any such act or satisfy such obligation, or otherwise remedy such emergency or such failure on the part of Grantee. All costs incurred by PG&E in responding to or remedying such failure by Grantee shall be payable by Grantee to PG&E on demand.

5. Indemnification; Release.

(a) Grantee shall, to the maximum extent permitted by law, indemnify, protect, defend and hold harmless PG&E, its parent corporation, subsidiaries and affiliates, and their respective officers, managers, directors, representatives, agents, employees, transferees, successors and assigns (each, an "Indemnitee" and collectively, "Indemnitees") from and against all claims, losses (including, but not limited to, diminution in value), actions, demands, damages, costs,

expenses (including, but not limited to, experts fees and reasonable attorneys' fees and costs) and liabilities of whatever kind or nature (collectively, "Claims"), including Claims arising from the passive or active negligence of the Indemnitees, which arise from or are in any way connected with the occupancy or use of the Easement Area by Grantee or Grantee's Representatives, or the exercise by Grantee of its rights hereunder, or the performance of, or failure to perform, Grantee's duties under this Agreement, including, but not limited to, Claims arising out of: (1) injury to or death of persons, including but not limited to employees of PG&E or Grantee (and including, but not limited to, injury due to exposure to EMFs and other Potential Environmental Hazards in, on or about the Property); (2) injury to property or other interest of PG&E, Grantee or any third party; (3) violation of any applicable federal, state, or local laws, statutes, regulations, or ordinances, including all Legal Requirements relating to human health or the environment, and including any liability which may be imposed by law or regulation without regard to fault; excepting only with respect to any Indemnitee, to the extent of any Claim arising from the sole negligence or willful misconduct of such Indemnitee. Without limiting the generality of the foregoing, Grantee shall, to the maximum extent permitted by law, indemnify, protect, defend and hold Indemnitees harmless from and against Claims arising out of or in connection with any work of improvement constructed or installed at or on, labor performed on, or materials delivered to, or incorporated in any improvements constructed on, the Easement Area by, or at the request or for the benefit of, Grantee. In the event any action or proceeding is brought against any Indemnitee for any Claim against which Grantee is obligated to indemnify or provide a defense hereunder, Grantee upon written notice from PG&E shall defend such action or proceeding at Grantee's sole expense by counsel approved by PG&E, which approval shall not be unreasonably withheld, conditioned or delayed.

(b) Grantee acknowledges that all Claims arising out of or in any way connected with releases or discharges of any Hazardous Substance, or the exacerbation of a Potential Environmental Hazard, occurring as a result of or in connection with Grantee's use or occupancy of the Easement Area or the surrounding Property, or any of the activities of Grantee and Grantee's Representatives, and all costs, expenses and liabilities for environmental investigations, monitoring, containment, abatement, removal, repair, cleanup, restoration, remediation and other response costs, including reasonable attorneys' fees and disbursements and any fines and penalties imposed for the violation of Legal Requirements relating to the environment or human health, are expressly within the scope of the indemnity set forth above.

(c) Grantee's use of the Property shall be at its sole risk and expense. Grantee accepts all risk relating to its occupancy and use of the Easement Area. PG&E shall not be liable to Grantee for, and Grantee hereby waives and releases PG&E and the other Indemnitees from, any and all liability, whether in contract, tort or on any other basis, for any injury, damage, or loss resulting from or attributable to any occurrence on or about the Easement Area, the condition of Easement Area, or the use or occupancy of the Easement Area.

(d) Grantee shall, to the maximum extent permitted by law, indemnify, protect, defend and hold Indemnitees harmless against claims, losses, costs (including, but not limited to, attorneys' fees and costs), liabilities and damages resulting from the failure of Grantee, or any of its contractors or subcontractors, to comply with the insurance requirements set forth in **Exhibit C**, attached hereto and made a part hereof. If Grantee fails to so indemnify, protect, defend or hold harmless any Indemnitee, then at PG&E's option, this Agreement shall terminate, and the estate

and interest herein granted to Grantee shall revert to and revest in PG&E, if such failure continues for five (5) days following the giving of written notice of termination to Grantee, unless within such time such failure is cured to the reasonable satisfaction of PG&E.

(e) The provisions of this Section 5 shall survive the termination of this Agreement.

6. Additional Facilities. Grantee shall not install any additional facilities or improvements in, on, under or over the Easement Area without the prior written consent of PG&E, which consent may be granted or withheld in PG&E's sole and absolute discretion, and the prior consent, to the extent required by applicable law or regulation, of the CPUC. Grantee shall submit plans for installation of any proposed additional facilities within the Easement Area to PG&E for its written approval at the address specified in Section 12.

7. Reserved Rights. Subject to the provisions of Section 9 below, PG&E reserves the right to use the Easement Area for any and all purposes which will not unreasonably interfere with Grantee's facilities. Without limiting the generality of the foregoing:

(a) PG&E reserves the right to make use of the Easement Area for such purposes as it may deem necessary or appropriate if, and whenever, in the interest of its service to its patrons or consumers or the public, it shall appear necessary or desirable to do so.¹

(b) Grantee acknowledges that PG&E may have previously granted, and may in the future grant, certain rights in and across the Easement Area to others, and the use of the word "grant" in this Agreement shall not be construed as a warranty or covenant by PG&E that there are no such other rights.

(c) Grantee shall not make use of the Easement Area in any way which will endanger human health or the environment, create a nuisance or otherwise be incompatible with the use of the Easement Area, the Property, or PG&E's adjacent property, by PG&E or others entitled to use such property.

(d) This grant is made subject to all applicable provisions of General Order No. 95 (Overhead Electric), General Order 112 (Gas) and General Order No. 128 (Underground Electric) of the CPUC, in like manner as though said provisions were set forth herein.

8. Governmental Approvals. This Agreement shall not become effective, notwithstanding that it may have been executed and delivered by the parties, and Grantee shall not commence construction or other activities hereunder, unless and until the CPUC approves this

¹ Optional: Insert if the Property is within a FERC project area:

Grantee acknowledges that the Property is a part of the Federal Energy Regulatory Commission ("FERC") Project No. _____. PG&E reserves the right to use the Property, including the Easement Area, in all ways and for all purposes necessary or appropriate to its obligations as licensee under FERC Project No. _____.

Grantee shall not make use of the Easement Area in any way which would be incompatible with overall project recreational uses.

Agreement and the easements granted and other transactions contemplated hereby (including the adequacy of the compensation to be paid by Grantee), by an order which is final, unconditional and unappealable (including exhaustion of all administrative appeals or remedies before the CPUC). Grantee further acknowledges and agrees that PG&E makes no representation or warranty regarding the prospects for CPUC approval, and Grantee hereby waives all Claims against PG&E which may arise out of the need for such CPUC approval or the failure of the CPUC to grant such approval. This Agreement is made subject to all the provisions of such approval, as more particularly set forth in CPUC (Disposition Letter Advice Letter Decision _____²), in like manner as though said provisions were set forth in full herein.

9. Relocation. Subject to the provisions of this Section 9, the rights granted to Grantee herein shall forever be subordinate to PG&E's right to replace, reconstruct, relocate, operate and maintain PG&E's existing and/or future facilities, including, but not limited to, PG&E's existing electrical transmission lines which traverse the Property. If PG&E's use of its reserved rights described above necessitates the relocation of any of Grantee's facilities, Grantee shall, at its own cost and expense, relocate such facilities to an alternate location mutually agreed upon between PG&E and Grantee, provided Grantee is given at least twenty (20) days prior written notice of such required relocation. Any such relocation of Grantee's facilities shall be coordinated and scheduled between PG&E and Grantee so as to minimize, to the extent practicable, any interference with Grantee's use and operation of its facilities resulting from such relocation. If no alternate location is available on the Property, this Agreement shall terminate.

10. Compliance; Insurance. PG&E shall have a right to access and inspect the Easement Area at any time to confirm Grantee's compliance with Legal Requirements and the provisions of this Agreement. Prior to the Effective Date of this Agreement, Grantee shall procure, and thereafter Grantee shall carry and maintain in effect at all times during the term of the Agreement, with respect to the Easement Area and the use, occupancy and activities of Grantee, its employees and agents on or about the Easement Area, the insurance specified in **Exhibit C**, attached hereto and made a part hereof by this reference, provided that PG&E reserves the right to review and modify from time to time the coverages and limits of coverage required hereunder, as well as the deductibles and/or self-insurance retentions in effect from time to time (but PG&E agrees that it will not increase required coverage limits more often than once in any five-year period). Prior to Grantee's entry on the Property, and thereafter thirty (30) days prior to the expiration date of any policy, Grantee shall provide PG&E with evidence of the insurance coverage, or continuing coverage, as required by this Agreement. All insurance required under this Agreement shall be effected under valid, enforceable policies issued by insurers of recognized responsibility, as reasonably determined by PG&E, and shall be written on forms and with insurance carriers acceptable to PG&E. Grantee is also responsible for causing its agents, contractors and subcontractors to comply with the insurance requirements of this Agreement at all relevant times (provided, however, that Grantee, in the exercise of its reasonable judgment, may permit contractors and subcontractors to maintain coverages and limits lower than those required of Grantee, provided the coverages and limits required by Grantee are commercially reasonable in light of applicable circumstances). Any policy of liability insurance required to be maintained hereunder by Grantee may be maintained under a so-called "blanket policy" insuring other

² insert CPUC number.

locations and/or other persons, so long as PG&E is specifically named as an additional insured under such policy and the coverages and amounts of insurance required to be provided hereunder are not thereby impaired or diminished. In addition, liability insurance coverages may be provided under single policies for the full limits, or by a combination of underlying policies with the balance provided by excess or umbrella liability insurance policies.

For so long as Grantee (a) is an agency or instrumentality of the United States of America, the State of California or any political subdivision thereof, or (b) is a public utility (as that term is defined in the California Public Utilities Code), or (c) maintains a net worth (measured in accordance with generally accepted accounting principles applicable to public utility companies) not less than twenty (20) times the limit of liability (per-occurrence) from time to time required hereunder for Grantee's Commercial General Liability Insurance coverage (or if such coverage is no longer available, its replacement); then Grantee may elect to self-insure for any or all of the required coverage. If Grantee is permitted to self-insure hereunder and elects to do so, Grantee shall be liable to PG&E for the full equivalent of insurance coverage which would have been available to PG&E if all required insurance policies had been obtained by Grantee from a third party insurer, in the form required by this Agreement, and shall pay on behalf of or indemnify PG&E for all amounts which would have been payable by the third party insurer. In addition, Grantee shall act with the same promptness and subject to the same standards of good faith as would apply to a third party insurance company.

11. Mechanics' Liens. Grantee shall keep the Property free and clear of all mechanics', material suppliers' or similar liens, or claims thereof, arising or alleged to arise in connection with any work performed, labor or materials supplied or delivered, or similar activities performed by Grantee or at its request or for its benefit. If any mechanics' liens are placed on the Property in connection with the activities or facilities set forth in this Agreement, Grantee shall promptly cause such liens to be released and removed from title, either by payment or by recording a lien release bond in the manner specified in California Civil Code Section 3143 or any successor statute.

12. Notice. Any notices or communications hereunder shall be in writing and shall be personally delivered or sent by first class mail, certified or registered, postage prepaid, or sent by national overnight courier, with charges prepaid for next business day delivery, addressed to the addressee party at its address or addresses listed below, or to such other address or addresses for a party as such party may from time to time designate by notice given to the other party. Notices shall be deemed received upon actual receipt by the party being sent the notice, or on the following business day if sent by overnight courier, or on the expiration of three (3) business days after the date of mailing.

If to PG&E:

Pacific Gas and Electric Company
Attention: Land Agent
Laird Oelrichs
350 Salem Street, Chico, CA 95928

With a copy to:

If by registered or certified mail, return receipt requested:

Pacific Gas and Electric Company
Law Department
P.O. Box 7442
San Francisco, CA 94120
Attention: Director & Counsel, Contracts Section (Real Estate)

If by personal delivery or overnight courier:

Pacific Gas and Electric Company
Law Department
77 Beale Street, Mail Code B30A
San Francisco, California 94120
Attention: Director & Counsel, Contracts Section (Real Estate)

If to Grantee:

Attention: _____

With a copy to:

13. Governing Law. This Agreement shall in all respects be interpreted, enforced, and governed by and under the laws of the State of California.

14. Entire Agreement. This Agreement supersedes all previous oral and written agreements between and representations by or on behalf of the parties and constitutes the entire agreement of the parties with respect to the subject matter hereof. This Agreement may not be amended except by a written agreement executed by both parties.

15. Binding Effect. This Agreement and the covenants and agreements contained herein shall be binding upon, and shall inure to the benefit of, the parties hereto and their respective heirs, successors and assigns (subject to the provisions of Section 18). No assignment or delegation by Grantee, whether by operation of law or otherwise, shall relieve Grantee of any of its duties, obligations or liabilities hereunder, in whole or in part. The covenants of PG&E hereunder shall run with the land.

16. Assignment. Grantee shall not assign, convey, encumber (other than as may be specifically permitted by the terms of this Agreement), or otherwise transfer the easements and other rights herein conveyed, or any portion thereof or interest herein, without the prior written consent of PG&E. Such consent may be given or withheld by PG&E for any reason or for no reason, provided, however, that notwithstanding the foregoing, PG&E agrees that its consent will not be unreasonably withheld, delayed or conditioned in the case of: (a) a proposed transfer or dedication to a governmental agency, or (b) a proposed transfer to an Affiliate (as hereinafter defined) of Grantee. For purposes of the foregoing, an Affiliate of Grantee means an entity that controls, is controlled by, or is under common control with Grantee; the term “control” means the possession, directly or indirectly, of the power, whether or not exercised, to direct or cause the direction of the management or policies of an entity, whether through the ownership of voting securities, by contract or otherwise; and the term “controlled” and “common control” have correlative meanings. Grantee acknowledges and agrees that in any instance where PG&E is required not to unreasonably withhold its consent, it shall be reasonable for PG&E to withhold its consent if any regulatory agency having or asserting jurisdiction over PG&E or the Easement Area, or having or claiming a right to review and/or approve the proposed transfer, fails to grant approval thereof (or imposes conditions on such approval which are not acceptable to PG&E, in its reasonable discretion). Grantee further acknowledges and agrees that in any instance where PG&E is required not to unreasonably delay giving or withholding its consent, it shall be reasonable for PG&E to make application for approval to any regulatory agency having or asserting jurisdiction, and to defer the giving or withholding of consent, without liability hereunder for delay, during the pendency and for a reasonable time following the conclusion of any such regulatory proceedings.

17. Attorneys’ Fees. Should either party bring an action against the other party, by reason of or alleging the failure of the other party with respect to any or all of its obligations hereunder, whether for declaratory or other relief, then the party which prevails in such action shall be entitled to its reasonable attorneys’ fees (of both in-house and outside counsel) and expenses related to such action, in addition to all other recovery or relief. A party shall be deemed to have prevailed in any such action (without limiting the generality of the foregoing) if such action is dismissed upon the payment by the other party of the sums allegedly due or the performance of obligations allegedly not complied with, or if such party obtains substantially the relief sought by it in the action, irrespective of whether such action is prosecuted to judgment. Attorneys’ fees shall include, without limitation, fees incurred in discovery, contempt proceedings and bankruptcy litigation, and in any appellate proceeding. The non-prevailing party shall also pay the attorney’s fees and costs incurred by the prevailing party in any post-judgment proceedings to collect and enforce the judgment. The covenant in the preceding sentence is separate and several and shall survive the merger of this provision into any judgment on this Agreement. For purposes hereof, the reasonable fees of PG&E’s in-house attorneys who perform services in connection with any such action shall be recoverable, and shall be based on the fees regularly charged by private attorneys with the equivalent number of years of experience in the relevant subject matter area of the law, in law firms in the City of San Francisco with approximately the same number of attorneys as are employed by PG&E’s Law Department.

18. No Waiver. No waiver with respect to any provision of this Agreement shall be effective unless in writing and signed by the party against whom it is asserted. No waiver of any provision of this Agreement by a party shall be construed as a waiver of any subsequent breach or failure of the same term or condition, or as a waiver of any other provision of this Agreement.

19. No Offsets. Grantee acknowledges that PG&E is executing this Agreement in its capacity as the owner of the Easement Area, and not in its capacity as a public utility company or provider of electricity and natural gas. Notwithstanding anything to the contrary contained herein, no act or omission of Pacific Gas and Electric Company or its employees, agents or contractors as a provider of electricity and natural gas shall abrogate, diminish, or otherwise affect the respective rights, obligations and liabilities of PG&E and Grantee under this Agreement. Further, Grantee covenants not to raise as a defense to its obligations under this Agreement, or assert as a counterclaim or cross-claim in any litigation or arbitration between PG&E and Grantee relating to this Agreement, any claim, loss, damage, cause of action, liability, cost or expense (including, but not limited to, attorneys' fees) arising from or in connection with Pacific Gas and Electric Company's provision of (or failure to provide) electricity and natural gas.

20. No Dedication. Nothing contained in this Agreement shall be deemed to be a gift or dedication of land or rights to the general public. The right of the public or any person, including Grantee, to make any use whatsoever of the Easement Area or any portion thereof, other than as expressly permitted herein or as expressly allowed by a recorded map, agreement, deed or dedication, is by permission and is subject to the control of PG&E in its sole discretion.

21. No Third Party Beneficiary. This Agreement is solely for the benefit of the parties hereto and their respective successors and permitted assigns, and, except as expressly provided herein, does not confer any rights or remedies on any other person or entity.

22. Captions. The captions in this Agreement are for reference only and shall in no way define or interpret any provision hereof.

23. Time. Except as otherwise expressly provided herein, the parties agree that as to any obligation or action to be performed hereunder, time is of the essence.

24. Severability. If any provision of this Agreement shall be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each provision of this Agreement shall be valid and enforced to the full extent permitted by law, provided the material provisions of this Agreement can be determined and effectuated.

25. Counterparts. This Agreement may be executed in identical counterpart copies, each of which shall be an original, but all of which taken together shall constitute one and the same agreement.

26. Other Documents. Each party agrees to sign any additional documents or permit applications which may be reasonably required to effectuate the purpose of this Agreement. Provided, however, that PG&E will not be required to take any action or execute any document that would result in any cost, expense or liability to PG&E.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year first set forth above.

PACIFIC GAS AND ELECTRIC COMPANY,
a California corporation

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

By: _____
Ralph Medina

William Croyle
Acting Director of Water Resources

Its: Manager, Land Rights

By: _____
Jeanne M. Kuttel

Its: Chief, Division of Engineering

Exhibits A, B and C attached

Attach to LD

The Area and Division: 6

Land Service Office: Sacramento

Operating Department: Electric Transmission

USGS location: MDM, T19N, R4E, E ½ of Sec 3 & W ½ of Sec 2

FERC License Number(s): NA

PLAT NO.: X36, G25

LD of any affected documents: NA

LD of any Cross-referenced documents: 2120-04-0347, 0184, 0266, 2121-04-0213

TYPE OF INTEREST: 02, 06, 11c, 42

SBE Parcel Number: 135-04-065G, 135-04-065E

Order # or PM #: 74011245 / 1800

JCN: 06-17-010

County: BUTTE

Utility Notice Numbers: NA

851 Approval Application No. _____ Decision _____

Prepared By: EKF2

Checked By: DPM2

Approved By: JEN8

S:\Bldg\Land_TRANSMISSION PROJECTS\0617010-31304842-Oroville Spillway Emergency

EXHIBIT A
PG&E PROPERTY
(to be attached)

DRAFT

EXHIBIT B
EASEMENT AREA(S)
(to be attached)

DRAFT

EXHIBIT C

INSURANCE REQUIREMENTS

Grantee shall procure, carry and maintain in effect throughout the term of this Agreement the following insurance coverage. Grantee is also responsible for its subcontractors maintaining sufficient limits of the appropriate insurance coverages.

A. Workers' Compensation and Employers' Liability

1. Workers' Compensation insurance indicating compliance with any and all applicable labor codes, acts, laws or statutes, state or federal.
2. Employer's Liability insurance shall not be less than \$1,000,000 for injury or death, each accident.

B. Commercial General Liability

1. Coverage shall be at least as broad as the Insurance Services Office (ISO) Commercial General Liability insurance "occurrence" form with no additional coverage alterations.
2. The limits shall not be less than Ten Million Dollars (\$10,000,000) per occurrence for bodily injury, property damage and products and completed operations. Defense costs are to be provided outside the policy limits.
3. Coverage shall include: a) an "Additional Insured" endorsement (ISO Additional Insured form CG 2010 or equivalent coverage) adding as additional insureds PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of work performed by or for Grantee. If the policy includes "blanket endorsement by contract," the following language added to the certificate of insurance will satisfy PG&E's requirement: "by blanket endorsement, PG&E, its affiliates, subsidiaries, and parent company, and PG&E's directors, officers, agents and employees with respect to liability arising out of the work performed by or for the Grantee are included as additional insured"; and b) an endorsement or policy provision specifying that the Grantee's insurance is primary and that any insurance or self-insurance maintained by PG&E shall be excess and non-contributing.

C. Business Auto

1. Coverage shall be at least as broad as the Insurance Services Office (ISO) Business Auto Coverage form covering Automobile Liability, code 1 "any auto."
2. The limit shall not be less than Two Million Dollars (\$2,000,000) each accident for bodily injury and property damage occurring prior to completion of construction of Grantee's facilities, and One Million Dollars (\$1,000,000) each accident for bodily injury and property damage occurring thereafter.

D. Pollution Liability

1. Coverage for bodily injury, property damage, including clean up costs and defense costs resulting from sudden and gradual pollution conditions including the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, hydrocarbons, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any watercourse or body of water.
2. The limit shall not be less than Five Million Dollars (\$5,000,000) each occurrence for bodily injury and property damage.
3. PG&E shall be named as additional insured.

E. Additional Insurance Provisions

1. Upon the Effective Date of the Easement Agreement Grantee shall furnish PG&E with two (2) sets of certificates of insurance including required endorsements.
2. Documentation shall state that coverage shall not be canceled except after thirty (30) days prior written notice has been given to PG&E.
3. The documents must be signed by a person authorized by that insurer to bind coverage on its behalf and submitted to:

Pacific Gas and Electric Company
Insurance Department
One Market, Spear Tower, Suite 2400
San Francisco, California 94105

Pacific Gas and Electric Company
[Insert address of PG&E local office]

Attention: Land Agent

4. Upon request, Grantee shall furnish PG&E evidence of insurance for its agents or contractors.
5. PG&E may inspect the original policies or require complete certified copies at any time.

ITEM 5
PRELIMINARY TITLE REPORT

Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property



Fidelity National Title Company

2150 John Glenn Dr, Suite 400, Concord, CA 94520
Phone: (925) 288-8000 • Fax:

Issuing Policies of Fidelity National Title Insurance Company

Order No.: 01001317-010-PA-CDT

Title Officer: Craig Donner

TO:

Department of Water Resources
1416 9th Street, Room 415
Sacramento, CA 95814

Escrow Officer: Paul Avila
1375 Exposition Blvd., Suite 240
Sacramento, CA 95815
(916) 646-6018
(916) 646-6043

ATTN: **Preston Good**

YOUR REFERENCE:

PROPERTY ADDRESS: 041-290-120, 033-010-055, 069-010-019, Oroville, CA

PRELIMINARY REPORT

*In response to the application for a policy of title insurance referenced herein, **Fidelity National Title Company** hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a policy or policies of title insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an exception herein or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations or Conditions of said policy forms.*

The printed Exceptions and Exclusions from the coverage and Limitations on Covered Risks of said policy or policies are set forth in Attachment One. The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. Limitations on Covered Risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a Deductible Amount and a Maximum Dollar Limit of Liability for certain coverages are also set forth in Attachment One. Copies of the policy forms should be read. They are available from the office which issued this report.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

The policy(s) of title insurance to be issued hereunder will be policy(s) of Fidelity National Title Insurance Company, a Nebraska Corporation.

Please read the exceptions shown or referred to herein and the exceptions and exclusions set forth in Attachment One of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.

Countersigned by:

Authorized Signature



By:

Randy Quirk, President

Attest:

Michael Bravatin, Secretary



Fidelity National Title Company
2150 John Glenn Dr, Suite 400, Concord, CA 94520
Phone: (925) 288-8000 • Fax:

PRELIMINARY REPORT

EFFECTIVE DATE: March 8, 2017 at 7:30 a.m.

ORDER NO.: 01001317-010-PA-CDT

The form of policy or policies of title insurance contemplated by this report is:

CLTA Standard Coverage Policy (04-08-14)

1. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:

Fee as to Parcels One, Three, Six and Seven and Easement Estate, as to Parcels Two, Four, Five, and Eight

2. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

Pacific Gas and Electric Company, a California corporation

3. THE LAND REFERRED TO IN THIS REPORT IS DESCRIBED AS FOLLOWS:

See Exhibit A attached hereto and made a part hereof.

**Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property**

Your Reference:

Fidelity National Title Company

**EXHIBIT A
LEGAL DESCRIPTION**

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF OROVILLE, IN THE COUNTY OF BUTTE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE:

The West half of the Northeast quarter and the Northwest quarter of the Southeast quarter and Southeast quarter of the Northwest Quarter of Section 34, Township 20 North, Range 4 East, M. D. B. M.

EXCEPTING THEREFROM all that certain property lying North and Westerly of Oregon Gulch Road.

ALSO EXCEPTING THEREFROM all that property described in that certain "Grant Deed" to Clinton Foster and Geraldine Foster, husband and wife as joint tenants, recorded May 22, 1996, in Instrument No. 96-018883, of Official Records

APN: 041-290-120 PTN.

PARCEL TWO:

An Easement for existing Electrical Facilities, and Ingress and Egress as reserved in that Grant Deed, recorded May 22, 1996, in Instrument No. 96-018883, of Official Records

PARCEL THREE:

The South half of the Southeast quarter and The East half of the Southwest quarter of Section 34, Township 20 North, Range 4 East, M. D. B. & M.

EXCEPTING THEREFROM all that property described in that certain "Grant Deed" to the State of California, recorded January 18, 1963, in Book 1222, Page 462, of Official Records

ALSO EXCEPTING THEREFROM all that property described in that certain "Grant Deed" to the State of California, recorded August 20, 1968 in Book 1531, Page 29, of Official Records.

APN: 041-290-120 PTN.

PARCEL FOUR:

An Easement for Electrical Facilities as reserved in that Grant Deed recorded January 18, 1963, in Book 1222, Page 462, of Official Records.

PARCEL FIVE:

An Easement for Electrical Facilities as reserved in that Grant Deed recorded August 20, 1968, in Book 1531, Page 29, of Official Records.

**Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property**

Your Reference:

Fidelity National Title Company

**EXHIBIT A
(Continued)**

PARCEL SIX:

All that portion of the Southeast quarter of Section 3, Township 19 North, Range 4 East, M. D. B. & B. lying Easterly and Southerly of Oro Dam Blvd.

APN: 033-010-054 PTN.

APN: 033-010-055 PTN.

PARCEL SEVEN:

The South half of Section Two, Township 19, North, Range 4 East, M. D. B. & M.

EXCEPTING THEREFROM all that property described in that certain "Grant Deed" to Oroville-Wyandotte Irrigation District, a California Irrigation District, recorded December 18, 1961, in Book 1154, Page 334, of Official Records.

ALSO EXCEPTING THEREFROM all that property described in that certain "Grant Deed" to the State of California, recorded January 18, 1963, in Book 1222, Page 462, of Official Records

APN: 069-010-019 PTN.

PARCEL EIGHT:

An easement for maintaining existing Electrical Facilities as reserved in Grant Deed recorded January 18, 1963, in Book 1222, Page 462, of Official Records.

Your Reference:

Fidelity National Title Company

EXCEPTIONS

AT THE DATE HEREOF, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN SAID POLICY FORM WOULD BE AS FOLLOWS:

1. Property taxes, which are a lien not yet due and payable, including any assessments collected with taxes to be levied for the fiscal year 2017-2018.

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

2. The lien of supplemental or escaped assessments of property taxes, if any, made pursuant to the provisions of Chapter 3.5 (commencing with Section 75) or Part 2, Chapter 3, Articles 3 and 4, respectively, of the Revenue and Taxation Code of the State of California as a result of the transfer of title to the vestee named in Schedule A or as a result of changes in ownership or new construction occurring prior to Date of Policy.

3. Rights of the public to any portion of the Land lying within the area commonly known as

Oro Dam Blvd.

4. Matters contained in that certain document

Entitled: GRANT DEED
Dated: July 24, 1962
Executed by: Pacific Gas and Electric Company and the State of California
Recording Date: January 18, 1963
Recording No: Book 1222, Page 462, of Official Records

Reference is hereby made to said document for full particulars.

5. Matters contained in that certain document

Entitled: GRANT DEED
Dated: April 11, 1968
Executed by: Pacific Gas and Electric Company and the State of California
Recording Date: August 20, 1968
Recording No: Book 1531, Page 29, of Official Records

Reference is hereby made to said document for full particulars.

6. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: State of California
Purpose: Maintaining Riding and Hiking Trails etc.
Recording Date: October 17, 1972
Recording No: Book 1792, Page 440, of Official Records

Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property

Your Reference:

Fidelity National Title Company

EXCEPTIONS
(Continued)

7. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:
- | | |
|-----------------|---|
| Granted to: | State of California |
| Purpose: | Underground Cable |
| Recording Date: | August 26, 1988 |
| Recording No: | Instrument No. 88-028654, of Official Records |
| Affects: | Parcel Seven |
8. Matters contained in that certain document
- | | |
|-----------------|---|
| Entitled: | GRANT DEED |
| Dated: | May 06, 1996 |
| Executed by: | Pacific Gas and Electric Company, a California corporation and Clinton M. Foster and Geraldine Foster |
| Recording Date: | May 22, 1996 |
| Recording No: | Instrument No. 96-018883, of Official Records |
- Reference is hereby made to said document for full particulars.
9. Any adverse claim based on the assertion that all or some portion of land is now or at any time has been below:
- A. The highest high water line of Lake Oroville, in the event the body of water has been artificially raised Or The high water line of the lake, if the lake is in its natural state.
10. Rights and easements for navigation and fishery which may exist over that portion of said Land lying beneath the waters of Lake Oroville
11. Any rights in favor of the public which may exist on said Land if said Land or portions thereof are or were at any time used by the public.
12. Any adverse claim based upon the assertion that said Land or any part thereof is now or at any time has been included within a navigable river, slough, or other navigable body of water.
13. Matters which may be disclosed by an inspection and/or by a correct ALTA/NSPS Land Title Survey of said Land that is satisfactory to the Company, and/or by inquiry of the parties in possession thereof.
14. Water rights, claims or title to water, whether or not disclosed by the public records.

Your Reference:

Fidelity National Title Company

**EXCEPTIONS
(Continued)**

15. Any rights of the parties in possession of a portion of, or all of, said Land, which rights are not disclosed by the public records.

The Company will require, for review, a full and complete copy of any unrecorded agreement, contract, license and/or lease, together with all supplements, assignments and amendments thereto, before issuing any policy of title insurance without excepting this item from coverage.

The Company reserves the right to except additional items and/or make additional requirements after reviewing said documents.

16. The transaction contemplated in connection with this Report is subject to the review and approval of the Company's Corporate Underwriting Department. The Company reserves the right to add additional items or make further requirements after such review.

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**PLEASE REFER TO THE "INFORMATIONAL NOTES" AND "REQUIREMENTS" SECTIONS WHICH
FOLLOW FOR INFORMATION NECESSARY TO COMPLETE THIS TRANSACTION.**

END OF EXCEPTIONS

Your Reference

Fidelity National Title Company

REQUIREMENTS SECTION

END OF REQUIREMENTS

Your Reference:

Fidelity National Title Company

INFORMATIONAL NOTES SECTION

1. None of the items shown in this report will cause the Company to decline to attach CLTA Endorsement Form 100 to an Extended Coverage Loan Policy, when issued.
2. The Company is not aware of any matters which would cause it to decline to attach CLTA Endorsement Form 116 indicating that there is located on said Land Public Utility properties, known as 041-290-120, 033-010-055, 069-010-019, located within the city of Oroville, California, 95966, to an Extended Coverage Loan Policy.
3. Note: The policy of title insurance will include an arbitration provision. The Company or the insured may demand arbitration. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the insured arising out of or relating to this policy, any service of the Company in connection with its issuance or the breach of a policy provision or other obligation. Please ask your escrow or title officer for a sample copy of the policy to be issued if you wish to review the arbitration provisions and any other provisions pertaining to your Title Insurance coverage.
4. Note: There are NO conveyances affecting said Land recorded within 24 months of the date of this report.
5. Note: The name(s) of the proposed insured(s) furnished with this application for title insurance is/are:

Name(s) furnished: Department of Water Resources

If these name(s) are incorrect, incomplete or misspelled, please notify the Company.
6. Note: The charge for a policy of title insurance, when issued through this title order, will be based on the Basic Title Insurance Rate.
7. Your application for title insurance was placed by reference to only a street address or tax identification number. Based on our records, we believe that the legal description in this report covers the parcel(s) of Land that you requested. If the legal description is incorrect, the seller/borrower must notify the Company and/or the settlement company in order to prevent errors and to be certain that the correct parcel(s) of Land will appear on any documents to be recorded in connection with this transaction and on the policy of title insurance.
8. Note: If a county recorder, title insurance company, escrow company, real estate broker, real estate agent or association provides a copy of a declaration, governing document or deed to any person, California law requires that the document provided shall include a statement regarding any unlawful restrictions. Said statement is to be in at least 14-point bold face type and may be stamped on the first page of any document provided or included as a cover page attached to the requested document. Should a party to this transaction request a copy of any document reported herein that fits this category, the statement is to be included in the manner described.
9. Note: Any documents being executed in conjunction with this transaction must be signed in the presence of an authorized Company employee, an authorized employee of an agent, an authorized employee of the insured lender, or by using Bancserv or other approved third-party service. If the above requirement cannot be met, please call the Company at the number provided in this report.

END OF INFORMATIONAL NOTES

Your Reference

Fidelity National Title Company

**INFORMATIONAL NOTES
(Continued)**

Craig Donner/rd

**FIDELITY NATIONAL FINANCIAL
PRIVACY NOTICE**

At Fidelity National Financial, Inc., we respect and believe it is important to protect the privacy of consumers and our customers. This Privacy Notice explains how we collect, use, and protect any information that we collect from you, when and to whom we disclose such information, and the choices you have about the use of that information. A summary of the Privacy Notice is below, and we encourage you to review the entirety of the Privacy Notice following this summary. You can opt-out of certain disclosures by following our opt-out procedure set forth at the end of this Privacy Notice.

<p>Types of Information Collected. You may provide us with certain personal information about you, like your contact information, address demographic information, social security number (SSN), driver's license, passport, other government ID numbers and/or financial information. We may also receive browsing information from your Internet browser, computer and/or mobile device if you visit or use our websites or applications.</p>	<p>How Information is Collected. We may collect personal information from you via applications, forms, and correspondence we receive from you and others related to our transactions with you. When you visit our websites from your computer or mobile device, we automatically collect and store certain information available to us through your Internet browser or computer equipment to optimize your website experience.</p>
<p>Use of Collected Information. We request and use your personal information to provide products and services to you, to improve our products and services, and to communicate with you about these products and services. We may also share your contact information with our affiliates for marketing purposes.</p>	<p>When Information Is Disclosed. We may disclose your information to our affiliates and/or nonaffiliated parties providing services for you or us, to law enforcement agencies or governmental authorities, as required by law, and to parties whose interest in title must be determined.</p>
<p>Choices With Your Information. Your decision to submit information to us is entirely up to you. You can opt-out of certain disclosure or use of your information or choose to not provide any personal information to us.</p>	<p>Information From Children. We do not knowingly collect information from children who are under the age of 13, and our website is not intended to attract children.</p>
<p>Privacy Outside the Website. We are not responsible for the privacy practices of third parties, even if our website links to those parties' websites.</p>	<p>International Users. By providing us with you information, you consent to its transfer, processing and storage outside of your country of residence, as well as the fact that we will handle such information consistent with this Privacy Notice.</p>
<p>The California Online Privacy Protection Act. Some FNF companies provide services to mortgage loan servicers and, in some cases, their websites collect information on behalf of mortgage loan servicers. The mortgage loan servicer is responsible for taking action or making changes to any consumer information submitted through those websites.</p>	
<p>Your Consent To This Privacy Notice. By submitting information to us or by using our website, you are accepting and agreeing to the terms of this Privacy Notice.</p>	<p>Access and Correction; Contact Us. If you desire to contact us regarding this notice or your information, please contact us at privacy@fnf.com or as directed at the end of this Privacy Notice.</p>

FIDELITY NATIONAL FINANCIAL, INC.
PRIVACY NOTICE

Fidelity National Financial, Inc. and its majority-owned subsidiary companies providing title insurance, real estate- and loan-related services (collectively, "FNF", "our" or "we") respect and are committed to protecting your privacy. We will take reasonable steps to ensure that your Personal Information and Browsing Information will only be used in compliance with this Privacy Notice and applicable laws. This Privacy Notice is only in effect for Personal Information and Browsing Information collected and/or owned by or on behalf of FNF, including Personal Information and Browsing Information collected through any FNF website, online service or application (collectively, the "Website").

Types of Information Collected

We may collect two types of information from you: Personal Information and Browsing Information.

Personal Information. FNF may collect the following categories of Personal Information:

- contact information (e.g., name, address, phone number, email address);
- demographic information (e.g., date of birth, gender, marital status);
- social security number (SSN), driver's license, passport, and other government ID numbers;
- financial account information; and
- other personal information needed from you to provide title insurance, real estate- and loan-related services to you.

Browsing Information. FNF may collect the following categories of Browsing Information:

- Internet Protocol (or IP) address or device ID/UDID, protocol and sequence information;
- browser language and type;
- domain name system requests;
- browsing history, such as time spent at a domain, time and date of your visit and number of clicks;
- http headers, application client and server banners; and
- operating system and fingerprinting data.

How Information is Collected

In the course of our business, we may collect *Personal Information* about you from the following sources:

- applications or other forms we receive from you or your authorized representative;
- the correspondence you and others send to us;
- information we receive through the Website;
- information about your transactions with, or services performed by, us, our affiliates or nonaffiliated third parties; and
- information from consumer or other reporting agencies and public records maintained by governmental entities that we obtain directly from those entities, our affiliates or others.

If you visit or use our Website, we may collect *Browsing Information* from you as follows:

- Browser Log Files. Our servers automatically log each visitor to the Website and collect and record certain browsing information about each visitor. The Browsing Information includes generic information and reveals nothing personal about the user.
- Cookies. When you visit our Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. When you visit a website again, the cookie allows the website to recognize your computer. Cookies may store user preferences and other information. You can choose whether or not to accept cookies by changing your Internet browser settings, which may impair or limit some functionality of the Website.

Use of Collected Information

Information collected by FNF is used for three main purposes:

- To provide products and services to you or any affiliate or third party who is obtaining services on your behalf or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you and to inform you about our, our affiliates' and third parties' products and services, jointly or independently.

When Information Is Disclosed

We may provide your Personal Information (excluding information we receive from consumer or other credit reporting agencies) and Browsing Information to various individuals and companies, as permitted by law, without obtaining your prior authorization. Such laws do not allow consumers to restrict these disclosures. Please see the section "Choices With Your Personal Information" to learn how to limit the discretionary disclosure of your Personal Information and Browsing Information.

Disclosures of your Personal Information may be made to the following categories of affiliates and nonaffiliated third parties:

- to third parties to provide you with services you have requested, and to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to our affiliate financial service providers for their use to market their products or services to you;
- to nonaffiliated third party service providers who provide or perform services on our behalf and use the disclosed information only in connection with such services;
- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to market financial products or services to you;
- to law enforcement or other governmental authority in connection with an investigation, or civil or criminal subpoena or court order;

Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property

- to lenders, lien holders, judgment creditors, or other parties claiming an interest in title whose claim or interest must be determined, settled, paid, or released prior to closing; and
- other third parties for whom you have given us written authorization to disclose your Personal Information.

We may disclose Personal Information and/or Browsing Information when required by law or in the good-faith belief that such disclosure is necessary to:

- comply with a legal process or applicable laws;
- enforce this Privacy Notice;
- investigate or respond to claims that any material, document, image, graphic, logo, design, audio, video or any other information provided by you violates the rights of a third party; or
- protect the rights, property or personal safety of FNF, its users or the public.

We maintain reasonable safeguards to keep your Personal Information secure. When we provide Personal Information to our affiliates or third party service providers as discussed in this Privacy Notice, we expect that these parties process such information in compliance with our Privacy Notice or in a manner that is in compliance with applicable privacy laws. The use of your information by a business partner may be subject to that party's own Privacy Notice. Unless permitted by law, we do not disclose information we collect from consumer or credit reporting agencies with our affiliates or others without your consent.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of our bankruptcy, reorganization, insolvency, receivership or an assignment for the benefit of creditors. You expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings. We cannot and will not be responsible for any breach of security by a third party or for any actions of any third party that receives any of the information that is disclosed to us.

Choices With Your Information

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you. The uses of your Personal Information and/or Browsing Information that, by law, you cannot limit, include:

- for our everyday business purposes – to process your transactions, maintain your account(s), to respond to law enforcement or other governmental authority in connection with an investigation, or civil or criminal subpoenas or court orders, or report to credit bureaus;
- for our own marketing purposes;
- for joint marketing with financial companies; and
- for our affiliates' everyday business purposes – information about your transactions and experiences.

You may choose to prevent FNF from disclosing or using your Personal Information and/or Browsing Information under the following circumstances ("opt-out"):

- for our affiliates' everyday business purposes – information about your creditworthiness; and
- for our affiliates to market to you.

To the extent permitted above, you may opt-out of disclosure or use of your Personal Information and Browsing Information by notifying us by one of the methods at the end of this Privacy Notice. We do not share your personal information with non-affiliates for their direct marketing purposes.

For California Residents: We will not share your Personal Information and Browsing Information with nonaffiliated third parties, except as permitted by California law. Currently, our policy is that we do not recognize "do not track" requests from Internet browsers and similar devices.

For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information and Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not share your Personal Information and Browsing Information with nonaffiliated third parties, except as permitted by Vermont law, such as to process your transactions or to maintain your account. In addition, we will not share information about your creditworthiness with our affiliates except with your authorization. For joint marketing in Vermont, we will only disclose your name, contact information and information about your transactions.

Information From Children

The Website is meant for adults and is not intended or designed to attract children under the age of thirteen (13). We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian. By using the Website, you affirm that you are over the age of 13 and will abide by the terms of this Privacy Notice.

Privacy Outside the Website

The Website may contain links to other websites. FNF is not and cannot be responsible for the privacy practices or the content of any of those other websites.

International Users

Oroville Spillway Transmission Line Relocation Project
Butte County, California
PG&E Property

FNF's headquarters is located within the United States. If you reside outside the United States or are a citizen of the European Union, please note that we may transfer your Personal Information and/or Browsing Information outside of your country of residence or the European Union for any of the purposes described in this Privacy Notice. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection and transfer of such information in accordance with this Privacy Notice.

The California Online Privacy Protection Act

For some FNF websites, such as the Customer CareNet ("CCN"), FNF is acting as a third party service provider to a mortgage loan servicer. In those instances, we may collect certain information on behalf of that mortgage loan servicer via the website. The information which we may collect on behalf of the mortgage loan servicer is as follows:

- first and last name;
- property address;
- user name and password;
- loan number;
- social security number - masked upon entry;
- email address;
- three security questions and answers; and
- IP address.

The information you submit through the website is then transferred to your mortgage loan servicer by way of CCN. **The mortgage loan servicer is responsible for taking action or making changes to any consumer information submitted through this website. For example, if you believe that your payment or user information is incorrect, you must contact your mortgage loan servicer.**

CCN does not share consumer information with third parties, other than (1) those with which the mortgage loan servicer has contracted to interface with the CCN application, or (2) law enforcement or other governmental authority in connection with an investigation, or civil or criminal subpoenas or court orders. All sections of this Privacy Notice apply to your interaction with CCN, except for the sections titled "Choices with Your Information" and "Access and Correction." If you have questions regarding the choices you have with regard to your personal information or how to access or correct your personal information, you should contact your mortgage loan servicer.

Your Consent To This Privacy Notice

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information by us in compliance with this Privacy Notice. Amendments to the Privacy Notice will be posted on the Website. Each time you provide information to us, or we receive information about you, following any amendment of this Privacy Notice will signify your assent to and acceptance of its revised terms for all previously collected information and information collected from you in the future. We may use comments, information or feedback that you submit to us in any manner that we may choose without notice or compensation to you.

Accessing and Correcting Information; Contact Us

If you have questions, would like to access or correct your Personal Information, or want to opt-out of information sharing with our affiliates for their marketing purposes, please send your requests to privacy@fnf.com or by mail or phone to:

Fidelity National Financial, Inc.
601 Riverside Avenue
Jacksonville, Florida 32204
Attn: Chief Privacy Officer
(888) 934-3354

Notice of Available Discounts

Pursuant to Section 2355.3 in Title 10 of the California Code of Regulations Fidelity National Financial, Inc. and its subsidiaries ("FNF") must deliver a notice of each discount available under our current rate filing along with the delivery of escrow instructions, a preliminary report or commitment. Please be aware that the provision of this notice does not constitute a waiver of the consumer's right to be charged the field rate. As such, your transaction may not qualify for the below discounts.

You are encouraged to discuss the applicability of one or more of the below discounts with a Company representative. These discounts are generally described below; consult the rate manual for a full description of the terms, conditions and requirements for each discount. These discounts only apply to transaction involving services rendered by the FNF Family of Companies. This notice only applies to transactions involving property improved with a one-to-four family residential dwelling.

FNF Underwritten Title Company

FNTC - Fidelity National Title Company
FNTCCA –Fidelity National Title Company of California

FNF Underwriter

FNTIC - Fidelity National Title Insurance Company

Available Discounts

CREDIT FOR PRELIMINARY REPORTS AND/OR COMMITMENTS ON SUBSEQUENT POLICIES (FNTIC)

Where no major change in the title has occurred since the issuance of the original report or commitment, the order may be reopened within 12 or 36 months and all or a portion of the charge previously paid for the report or commitment may be credited on a subsequent policy charge.

DISASTER LOANS (FNTIC)

The charge for a lender's Policy (Standard or Extended coverage) covering the financing or refinancing by an owner of record, within 24 months of the date of a declaration of a disaster area by the government of the United States or the State of California on any land located in said area, which was partially or totally destroyed in the disaster, will be 50% of the appropriate title insurance rate.

CHURCHES OR CHARITABLE NON-PROFIT ORGANIZATIONS (FNTIC)

On properties used as a church or for charitable purposes within the scope of the normal activities of such entities, provided said charge is normally the church's obligation the charge for an owner's policy shall be 50% to 70% of the appropriate title insurance rate, depending on the type of coverage selected. The charge for a lender's policy shall be 40% to 50% of the appropriate title insurance rate, depending on the type of coverage selected.

ATTACHMENT ONE

**CALIFORNIA LAND TITLE ASSOCIATION
STANDARD COVERAGE POLICY – 1990**

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building or zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien, or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
 - (a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
 - (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
 - (c) resulting in no loss or damage to the insured claimant;
 - (d) attaching or created subsequent to Date of Policy; or
 - (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated.
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any claim, which arises out of the transaction vesting in the insured the estate of interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

EXCEPTIONS FROM COVERAGE - SCHEDULE B, PART I

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.
6. Any lien or right to a lien for services, labor or material not shown by the public records.

**CLTA HOMEOWNER'S POLICY OF TITLE INSURANCE (12-02-13)
ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE**

EXCLUSIONS

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of those portions of any law or government regulation concerning:
 - a. building;
 - b. zoning;
 - c. land use;
 - d. improvements on the Land;
 - e. land division; and

**Oroville Spillway Transmission Line Relocation Project
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- f. environmental protection.
This Exclusion does not limit the coverage described in Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23 or 27.
2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not limit the coverage described in Covered Risk 14 or 15.
 3. The right to take the Land by condemning it. This Exclusion does not limit the coverage described in Covered Risk 17.
 4. Risks:
 - a. that are created, allowed, or agreed to by You, whether or not they are recorded in the Public Records;
 - b. that are Known to You at the Policy Date, but not to Us, unless they are recorded in the Public Records at the Policy Date;
 - c. that result in no loss to You; or
 - d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.e., 25, 26, 27 or 28.
 5. Failure to pay value for Your Title.
 6. Lack of a right:
 - a. to any land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
 - b. in streets, alleys, or waterways that touch the Land.
 This Exclusion does not limit the coverage described in Covered Risk 11 or 21.
 7. The transfer of the Title to You is invalid as a preferential transfer or as a fraudulent transfer or conveyance under federal bankruptcy, state insolvency, or similar creditors' rights laws.
 8. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
 9. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

LIMITATIONS ON COVERED RISKS

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:

- For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A.

The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount	Our Maximum Dollar Limit of Liability
Covered Risk 16:	1.00% % of Policy Amount Shown in Schedule A or \$2,500.00 (whichever is less)	\$ 10,000.00
Covered Risk 18:	1.00% % of Policy Amount Shown in Schedule A or \$5,000.00 (whichever is less)	\$ 25,000.00
Covered Risk 19:	1.00% of Policy Amount Shown in Schedule A or \$5,000.00 (whichever is less)	\$ 25,000.00
Covered Risk 21:	1.00% of Policy Amount Shown in Schedule A or \$2,500.00 (whichever is less)	\$ 5,000.00

2006 ALTA LOAN POLICY (06-17-06)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
 - (i) the occupancy, use, or enjoyment of the Land;
 - (ii) the character, dimensions, or location of any improvement erected on the Land;
 - (iii) the subdivision of land; or
 - (iv) environmental protection;
 or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
 - (a) created, suffered, assumed, or agreed to by the Insured Claimant;
 - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
 - (c) resulting in no loss or damage to the Insured Claimant;
 - (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13 or 14); or
 - (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.

6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
 - (a) a fraudulent conveyance or fraudulent transfer, or
 - (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

(Except as provided in Schedule B - Part II, (t or T)his policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:

(PART I

(The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material not shown by the Public Records.

PART II

In addition to the matters set forth in Part I of this Schedule, the Title is subject to the following matters, and the Company insures against loss or damage sustained in the event that they are not subordinate to the lien of the Insured Mortgage.)

2006 ALTA OWNER'S POLICY (06-17-06)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
 - (i) the occupancy, use, or enjoyment of the Land;
 - (ii) the character, dimensions, or location of any improvement erected on the Land;
 - (iii) the subdivision of land; or
 - (iv) environmental protection;or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
 - (a) created, suffered, assumed, or agreed to by the Insured Claimant;
 - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
 - (c) resulting in no loss or damage to the Insured Claimant;
 - (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
 - (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
 - (a) a fraudulent conveyance or fraudulent transfer, or
 - (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:

(The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown in the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and that are not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material not shown by the Public Records.
7. (Variable exceptions such as taxes, easements, CC&R's, etc. shown here.)

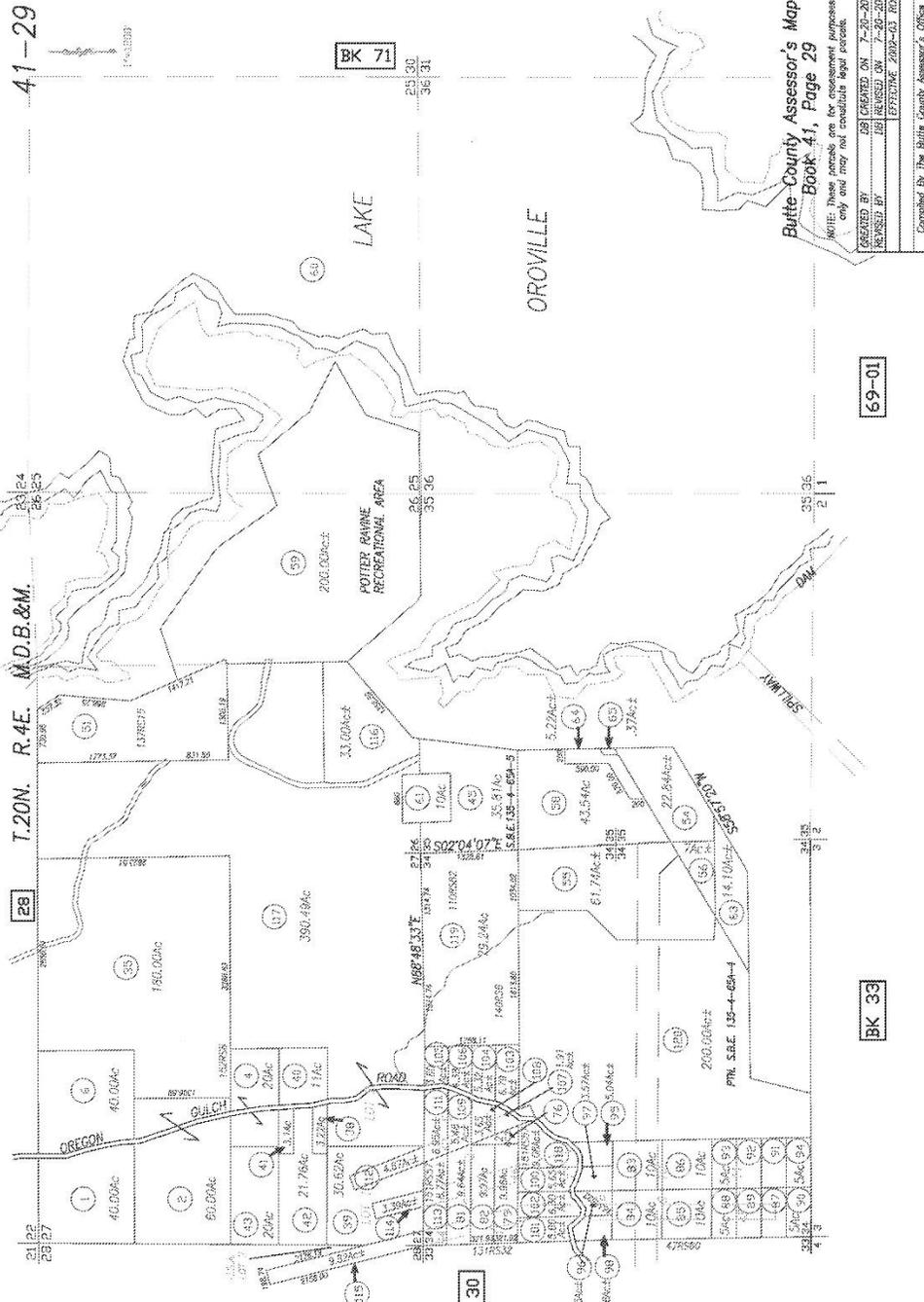
ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (12-02-13)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
 - (i) the occupancy, use, or enjoyment of the Land;
 - (ii) the character, dimensions, or location of any improvement erected on the Land;
 - (iii) the subdivision of land; or
 - (iv) environmental protection;or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
 - (a) created, suffered, assumed, or agreed to by the Insured Claimant;
 - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
 - (c) resulting in no loss or damage to the Insured Claimant;
 - (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 or 28); or
 - (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, or any consumer credit protection or truth-in-lending law. This Exclusion does not modify or limit the coverage provided in Covered Risk 26.
6. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to Advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching subsequent to Date of Policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11(b) or 25.
8. The failure of the residential structure, or any portion of it, to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This Exclusion does not modify or limit the coverage provided in Covered Risk 5 or 6.
9. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
 - (a) a fraudulent conveyance or fraudulent transfer, or
 - (b) a preferential transfer for any reason not stated in Covered Risk 27(b) of this policy.
10. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
11. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

Oroville Spillway Transmission Line Relocation Project
 Butte County, California
 PG&E Property



Butte County Assessor's Map
Book 41, Page 29

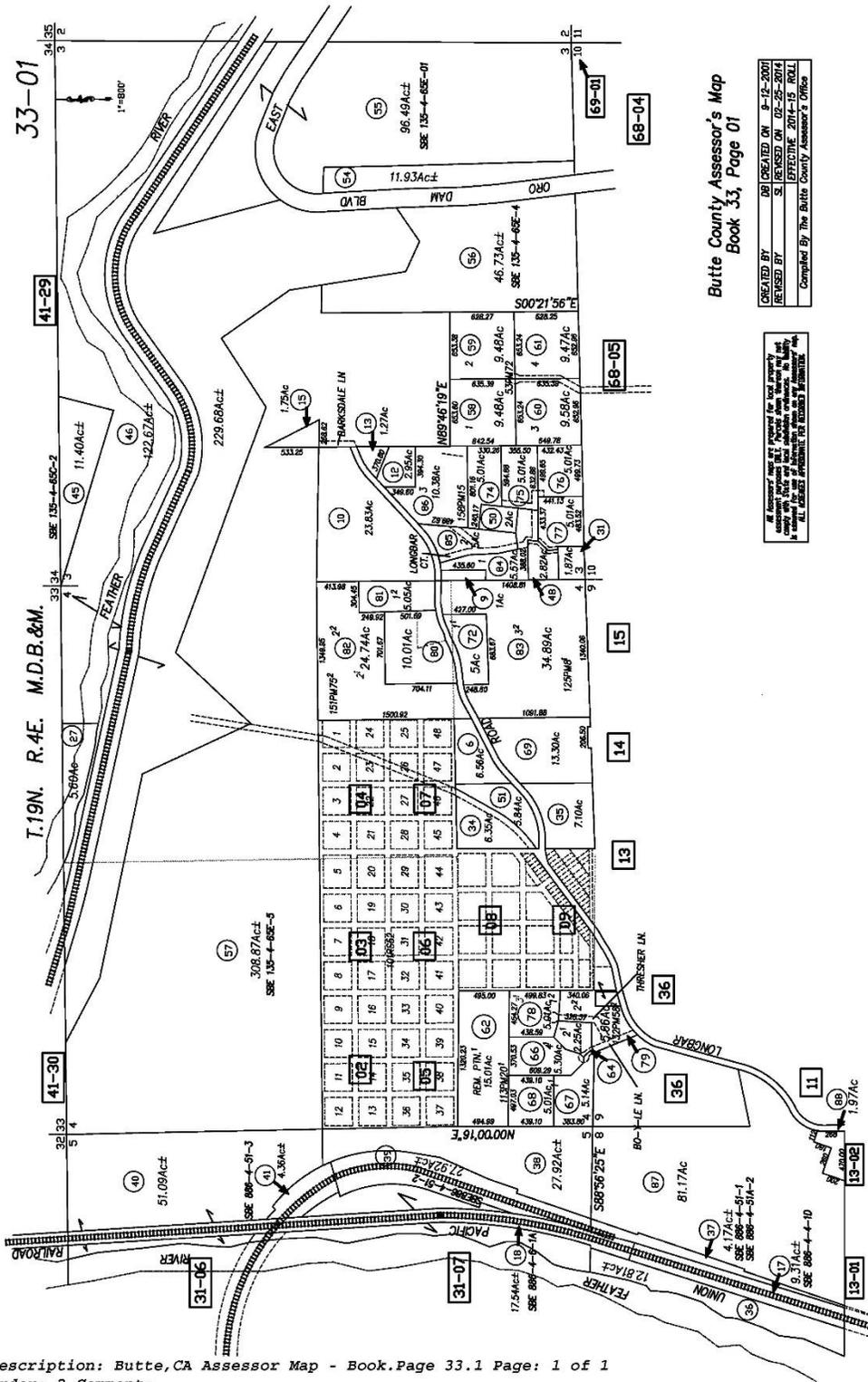
NOTE: These parcels are for assessment purposes only and may not constitute legal parcels.

CREATED BY: DBB
 CREATED ON: 7-20-2001
 REVISION: DBB
 REVISION ON: 7-20-2001
 REVISION BY: DBB
 EFFECTIVE: 2002-03-01

Computed By: The Butte County Assessor's Office

Description: Butte, CA Assessor Map - Book, Page 41.29 Page: 1 of 1
 Order: 2 Comment:

Oroville Spillway Transmission Line Relocation Project
 Butte County, California
 PG&E Property



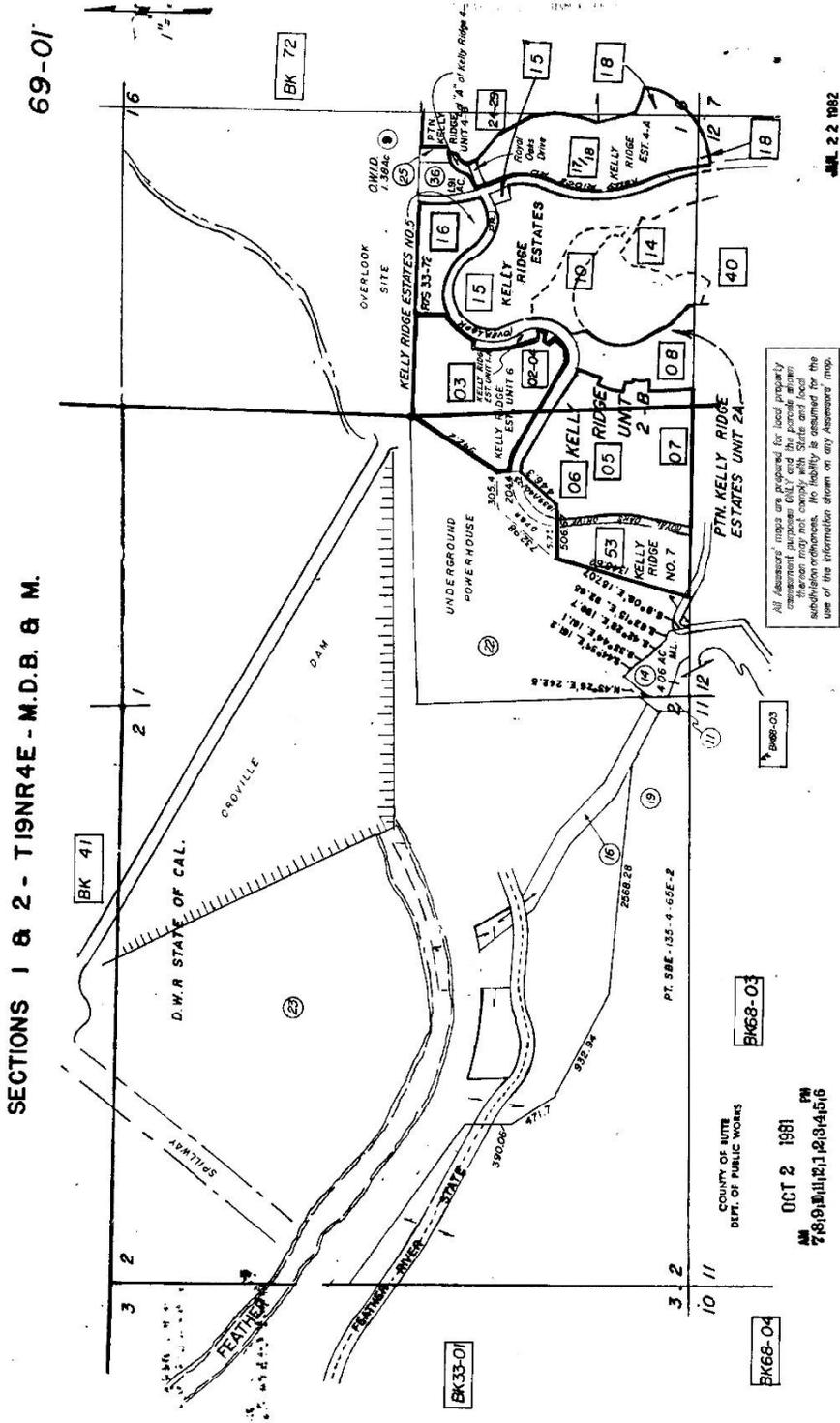
Description: Butte, CA Assessor Map - Book, Page 33.1 Page: 1 of 1
 Order: 2 Comment:

Butte County Assessor's Map
 Book 33, Page 01

CREATED BY: [redacted] ON: 9-12-2001
 REVISION: [redacted] ON: 02-25-2004
 EFFECTIVE: 2014-15 ROLL
 Compiled By: The Butte County Assessor's Office

ALL RIGHTS RESERVED TO THE BUTTE COUNTY ASSESSOR'S OFFICE. NO PART OF THIS MAP OR THE INFORMATION CONTAINED HEREIN MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE BUTTE COUNTY ASSESSOR'S OFFICE.

Oroville Spillway Transmission Line Relocation Project
 Butte County, California
 PG&E Property



SECTIONS 1 & 2 - T19NR4E - M.D.B. & M.

69-01

All Assessors' maps are prepared for local property measurement purposes ONLY and the parcels shown thereon may not comply with State and local subdivision requirements. No liability is assumed for the use of the information shown on any Assessor's map.

COUNTY OF BUTTE
 DEPT. OF PUBLIC WORKS
 OCT 2 1981
 AM 7:51:10 12:12:13/45/6

Assessor's Map No. 69-01
 County of Butte Calif
 JUL 22 1982

Description: Butte, CA Assessor Map - Book, Page 69.1 Page: 1 of 1
 Order: 2 Comment:

BRI 17-267

BENDER ROSENTHAL, INC.

ITEM 6
APPRAISERS' QUALIFICATIONS

**PROFESSIONAL QUALIFICATIONS OF
DAVID B. WRAA, MAI, ARA, AI-GRS**
(Principal in the firm of Bender Rosenthal, Inc.)



PROFESSIONAL EXPERIENCE

David B. Wraa, MAI, ARA, AI-GRS has been involved in real estate appraising and consulting since 1989. His professional experience in real estate appraisal encompasses a broad range of property types that include industrial, office, retail, multi-family, mobile home parks, self-storage facilities, elderly housing, condemnation, right-of-way, residential subdivisions, theaters, schools, marinas, and various agricultural/rural residential property types. He is a member of the Appraisal Institute with the MAI and AI-GRS designations, a member of the American Society of Farm Managers and Rural Appraiser, Inc. with the designation of ARA, a Certified General Real Estate Appraiser in the State of California and the State of Nevada.

Mr. Wraa is a former President of the Sacramento-Sierra Chapter of the Appraisal Institute, as well as the past Education Chair and Secretary Treasurer for the chapter.

Prior to his career in real estate, Mr. Wraa attended UC Davis, majoring in Agricultural Science and Management (Bachelor of Science degree). Upon graduation, he immediately entered the appraisal field with a specialty in wineries and vineyards (1989-1995). Mr. Wraa also has a diverse commercial background appraising various property types.

REPRESENTATIVE VALUATIONS INCLUDE

Industrial - Existing and proposed industrial properties including distribution warehouses, storage warehouses, light industrial/manufacturing and research and development properties.

Office - Existing and proposed office developments for lending institutions and owners.

Retail - Proposed and existing shopping centers, free standing buildings, mixed-use buildings, and restaurants.

Multi-Family Residential - Existing and proposed apartment complexes, condominiums, and loft projects in the Sacramento Metropolitan Area and Bay Area.

Medical - Existing and proposed medical clinics and dental offices.

Elderly Housing - Existing and proposed congregate care and residential care facilities throughout the Bay Area and Central Valley.

Residential Developments - Proposed and existing residential subdivisions throughout the Bay Area and Central Valley.

Agricultural - Vineyards, wineries, orchards, field/row crop land, and rural residential properties.

Special Use Properties - Special use properties include theaters throughout Northern California, schools in the Bay Area and Sacramento regions, marinas in the Sacramento MSA and Delta region.

Land - Various types of land appraised such as commercial land, retail pad sites, residential land, transitional land, and agricultural/rural residential land.

Eminent Domain - Improved and unimproved properties involving full and partial takings for municipalities, quasi-public companies, developers, and property owners.

Litigation - Valuations performed on various property types for eminent domain, arbitration, and divorce cases.

PROFESSIONAL AFFILIATIONS

Appraisal Institute (MAI, #11903), AI-GRS designation, Current Member, Past President of Sacramento-Sierra Ch. Sacramento Estate Planning Council, Current Member

American Society of Farm Managers and Rural Appraisers (ASFMRA), Current Member

**PROFESSIONAL QUALIFICATIONS OF
KELLI N. JOHNSON**

Certified General Real Estate Appraiser *CL# AG043915*

PROFESSIONAL EXPERIENCE

Kelli N. Johnson has been involved in real estate appraising and consulting since 2004. Her professional experience in real estate appraisal encompasses a broad range of property types.

REPRESENTATIVE VALUATIONS INCLUDE

Industrial - Existing and proposed industrial properties including distribution warehouses, storage warehouses, light industrial/manufacturing and research and development properties.

Office - Existing and proposed office developments.

Medical - Existing and proposed medical, dental, and veterinary clinics.

Retail - Proposed and existing shopping centers, free standing and mixed-use buildings and restaurants.

Residential Developments - Proposed and existing residential subdivisions.

Multi-Family Residential - Existing and proposed apartment complexes, condominiums, and mixed-use.

Self-Storage - Existing self-storage facilities.

Private Schools - Existing private preschools.

Senior Housing - Existing independent living and assisted living facilities.

Land - Various types of land appraised such as commercial land, retail pad sites, residential land, industrial land, transitional land, and agricultural/rural residential land.

Eminent Domain - Improved and unimproved properties of partial takings representing municipalities, conservancies, and property owners.

REAL ESTATE APPRAISAL EXPERIENCE

Bender Rosenthal, Inc., Sacramento, CA 6/2011-Present
Certified General Real Estate Appraiser

Seevers, Jordan, Ziegenmeyer, Rocklin, CA 6/2007-6/2011
Certified General Real Estate Appraiser

Sturgis-Bright Valuations, Inc., Richmond, CA 6/2004-5/2007
Appraiser Trainee

PROFESSIONAL AFFILIATIONS

Current Member of the Appraisal Institute - Sacramento-Sierra Chapter

EDUCATION

Appraisal Institute Courses

Appraisal Principals, Appraisal Procedures, General Appraiser Income Capitalization – Part I, General Market Analysis & Highest and Best Use, Real Estate Finance, Statistics, & Valuation Modeling, Residential Report Writing & Case Studies, Apartment Appraisal, Concepts & Applications, General Appraiser Sales Comparison Approach, Advanced Market Analysis and Highest & Best Use, General Appraiser Report Writing and Case Studies and USPAP.

Attachment 4

Initial FERC Filing

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791



May 17, 2017

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, Northeast
Washington, DC 20426

FERC Project No. 2100 – Oroville Emergency Recovery – Spillways,
High Voltage Transmission Relocation

Dear Secretary Bose:

The purpose of this letter is to inform the Federal Energy Regulatory Commission (FERC) of some of the current activities that the Department of Water Resources (DWR) is undertaking in the emergency response and recovery effort for the Oroville Spillway at FERC Project No. 2100. Pursuant to discussions with Commission staff, DWR is communicating its plans to relocate a transmission line and is describing its activities related to environmental and cultural resources.

As part of the Oroville Emergency Recovery – Spillways response effort covered by the federal major disaster declaration for California issued on April 2, 2017, DWR is permanently relocating approximately two miles of 230kV electrical transmission lines located near the Lake Oroville Flood Control Outlet spillway and the emergency spillway. The transmission lines are being relocated to avoid the potential for future damage to the transmission lines if water is released over the emergency spillway.

Due to record precipitation and inflows to Lake Oroville, continued use of the gated spillway was required following the February 7 event as erosion occurred from spillway use. This compromised two of the Oroville-Table Mountain 230kV Transmission Line Towers, critical components of the power conduit used by the Hyatt Powerplant to interconnect to the Bulk Electric System. DWR has determined that a permanent re-alignment of the transmission lines is essential to restore the reliability and capability to transmit high-voltage power to and from the Hyatt Powerplant. The new route will move the transmission line away from the main spillway and emergency spillway erosion zones and restore a permanently reliable route for power to and from the Oroville Facilities.

The project will require clearing of an approximate 300 foot (150 feet on each side of center line) corridor under the majority of the line and will also require

Ms. Kimberly D. Bose, Secretary
May 17, 2017
Page 2

construction of access roads and staging areas. Once all necessary permits and regulatory approvals are obtained, ground preparation is expected to begin in late May 2017. Construction of transmission towers and powerline installation will begin in early August 2017.

The new permanent transmission line alignment meets engineering standards for reliability and was selected with input from the Participating Transmission Owner, Pacific Gas and Electric Company (PG&E) and environmental resource specialists. The new alignment is partially outside of the FERC Project Boundary, passing through PG&E properties on the south side of the Diversion Pool. Interconnection points to the CAISO grid will remain the same. DWR is working with PG&E on a right-of-way agreement for the re-alignment. The agreement will also address PG&E's need for easement rights over DWR property for its separate relocated lines. A map of the alignment is attached. Once the construction work is completed, DWR will file a revised Exhibit G map and other revised license exhibits as needed to conform to the relocated transmission line.

Environmental and cultural resource surveys have been conducted in the project area and staff are working closely with design engineers to develop alternatives to lessen impacts to sensitive resources, including alternative route and design options for the relocated transmission lines. An active bald eagle nest is located near the siting of the transmission towers on the south side of the Division Pool. The nest is located on PG&E land in close proximity to DWR lands and the FERC Project boundary. DWR biologists are working with the U.S. Fish and Wildlife Service (USFWS) under the Bald and Golden Eagle Protection Act to develop avoidance measures and have worked with engineering to minimize disturbance. In addition, DWR has contacted the USFWS Migratory Bird Treaty Act (MBTA) staff regarding nesting birds and will conduct preconstruction nesting bird surveys. If necessary, DWR will apply for an MBTA Take Permit (Special Purpose Relocate Permit for emergencies) and relocate the nest and eggs or nestlings to a nearby rehabilitation facility. DWR has been coordinating with the United States Army Corps of Engineers under Clean Water Act Section 404 and will submit an emergency permit application if impacts to waters of the US are unavoidable.

Extensive cultural resource surveys were conducted during relicensing studies for Project 2100. New surveys are being conducted and existing site records updated. New discoveries will be recorded and cultural resources will be avoided when feasible. Cultural resources located in close proximity to construction areas will be monitored by DWR archaeologists, consulting archaeologists, and tribal monitors provided by the Estom Yumeka Maidu Tribe of the Enterprise Rancheria (Enterprise Rancheria). DWR has reached out to four tribes in the local community including the Berry Creek Rancheria of Tyme Maidu Indians, Enterprise Rancheria, Mooretown Rancheria of

Ms. Kimberly D. Bose, Secretary
May 17, 2017
Page 3

Maidu Indians, and Mechoopda Indian Tribe of Chico Rancheria and will continue to provide them opportunities for engagement. DWR will be consulting with the State Historic Preservation Officer to address effects to historic properties under Section 106 of the National Historic Preservation Act.

If you have questions or would like to discuss this further, please contact me at (916) 502-2067 or your staff may contact Gail Kuenster, Chief of DWR 's Environmental Compliance and Evaluation Branch in the Division of Environmental Services at (916) 376-9780.

Sincerely,



Ted Craddock, Project Manager
Oroville Emergency Recovery - Spillways
Executive Division

Enclosure

cc: Frank L. Blackett, P.E.
Regional Engineer
Federal Energy Regulatory Commission
100 First Street, Suite 2300
San Francisco, California 94105-3084

Document Content(s)

2017_0517_DWR-FERC_P2100_Trans Line Relocation_Ltr.PDF.....1-3

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791



June 16, 2017

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, Northeast
Washington, DC 20426

FERC Project No. 2100 – Oroville Facilities – Non-Project Use of
Project Lands, Pacific Gas and Electric Transmission Line Relocation

Dear Ms. Bose:

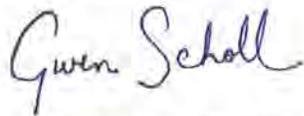
The Department of Water Resources (DWR) writes to acknowledge the Federal Energy Regulatory Commission's (FERC) request for additional information about the relocation of Pacific Gas and Electric's (PG&E) transmission lines within the boundary of FERC Project No. 2100 and to inform FERC of DWR's plans for complying with FERC's request. Prior correspondence, dated June 1 and June 16, 2017, addressed transmission line relocation associated with the Oroville Spillway emergency response and touched on the relocation of PG&E's transmission lines, but the correspondence was focused on the relocation of DWR's transmission lines.

The relocation of PG&E's transmission lines from the spillway to another location on project lands is a change in an existing non-project use. DWR agrees that a separate submission addressing this non-project use activity is warranted. A comprehensive description of this activity will be sent to you by June 23, 2017. By that date, DWR will strive to provide complete information about this activity, the emergency nature of this activity, the affected environment, its compatibility with FERC Project No. 2100, completed and on-going consultation on resources and permitting, real estate information with maps, and adjoining landowners. Much of this information will overlap with the current activity related to moving DWR's transmission lines and should be readily available. If additional time is needed to provide a comprehensive package, the June 23 submission will identify that missing information and when it will be provided.

Ms. Kimberly D. Bose, Secretary
June 16, 2017
Page 2

Your assistance in addressing this emergency response is appreciated. If you have any questions or would like to discuss this further, please contact me at (916) 557-4554 or you may contact Kevan Samsam at (916) 653-7589.

Sincerely,

A handwritten signature in blue ink that reads "Gwen Scholl". The signature is written in a cursive, flowing style.

Gwen Scholl, Acting Chief
Hydropower License Planning and Compliance Office
Executive Division

cc: Mr. Thomas LoVullo
Division of Hydropower Administration and Compliance
Federal Energy Regulatory Commission
888 First Street, Northeast
Washington, DC 20426

Mr. John Aedo
Federal Energy Regulatory Commission
100 First Street, Suite 2300
San Francisco, California 94105-3084

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791



June 19, 2017

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, Northeast
Washington, DC 20426

FERC Project No. 2100-180 – Oroville Emergency Recovery – Spillways
High Voltage Transmission Line Relocation

Dear Secretary Bose:

This letter follows up on our submittals on June 15, 2017 in response to the Federal Energy Regulatory Commission's (FERC) request for the Department of Water Resources (DWR) to provide additional information pertaining to the proposed partial relocation of the Oroville-Table Mountain Transmission Line, which is part of the Feather River Project No. 2100.

In our June 15, 2017 letter, we indicated we would submit the remaining supplemental information by June 20, 2017. The additional information requested is being submitted as enclosures to this letter and includes:

- Updated reference sheet (current submittals highlighted in red)
- Draft cultural resources report including tribal outreach; cultural site reports submitted to the California SHPO; SHPO and DWR correspondence, and concurrence letters
- Contractor-prepared analysis for the proposed project (60% design package). Contractor prepared 100% design for foundation installation component of the project

If you have questions or need additional information, please contact me at (916) 502-2067 or Gail Kuenster, Chief of DWR's Regulatory Compliance Office in the Division of Environmental Services at (916) 376-9780.

Ms. Kimberly D. Bose
June 19, 2017
Page 2

Sincerely,



Ted Craddock, Project Manager
Oroville Emergency Recovery – Spillways
Executive Division

Enclosures

cc: Thomas LoVullo
John Aedo
Gail Kuenster

Reference: Oroville Emergency Recovery Project – Powerline Reroute Component Draft Supporting Documentation for FERC NEPA Documentation

1. Clarification on the urgent nature of the transmission line relocation, including any operational, construction, or public safety concerns associated with the current line.

Refer to Attachment: Oroville TLRR Justification_April 20 2017 (Contains Critical Energy Infrastructure Information).

2. A tabulation of the final length, area impacted, and specifications of the proposed transmission line.

Refer to Figure 1: Project Description for a depiction three project components, the original transmission line, the temporary transmission line (shoefly), and the permanent reroute (Contains Critical Energy Infrastructure Information).

Refer to Figure 2: Area of Potential Effect and Clearing and Grubbing Zone. There is a table embedded table with the calculations of impact areas (Contains Critical Energy Infrastructure Information).

3. Identification of land ownership underlying the proposed new line route, and documentation of any agreements pertaining to the new transmission line.

Refer to Figure 3: Land Ownership (Contains Critical Energy Infrastructure Information).

Refer to Attachment: RealEstate_Memo_GK_Powerlines and Oroville Permanent Relocation Agreement w exhibits (Both contain Critical Energy Infrastructure Information)

4. Identification of other adjacent land owners affected by the transmission line construction, and documentation of consultation with any affected parties.

Refer to Figure 3: Land Ownership (Contains Critical Energy Infrastructure Information). Below is a list of parcels located within ¼ mile of the Project (Temporary and Permanent Reroute Alignments).

APN	APN_BLDG_F	OWNER_NAME	OWNER_ADDR	CITYSTZIP
41290060	041-290-060	STATE OF CALIFORNIA	0000	
41290058	041-290-058	HENDERSON REVOCABLE IV TRUST	915 LOIS AVE	SUNNYVALE CA 94087
41290055	041-290-055	DOROTHY M. RINGEL	1192 E 1ST AVE	CHICO CA 95926
41290120	041-290-120	PACIFIC GAS & ELECTRIC CO	P O BOX 770000	SAN FRANCISCO CA 94177
41290064	041-290-064	HENDERSON REVOCABLE INTERVIVOS T	915 LOIS AVE	SUNNYVALE CA 94087
41290065	041-290-065	HENDERSON REVOCABLE TRUST	9015 LOIS AVE	SUNNYVALE CA 94087
41290054	041-290-054	STATE OF CALIFORNIA	0000	
41290056	041-290-056	STATE OF CALIFORNIA	0000	
41290063	041-290-063	STATE OF CALIFORNIA	P O BOX 388	SACRAMENTO CA 95802
33010046	033-010-046	STATE OF CALIFORNIA		
33010999	033-010-999			

33010046	033-010-046	STATE OF CALIFORNIA		
33010998	033-010-998			
33010046	033-010-046	STATE OF CALIFORNIA		
33010057	033-010-057	PACIFIC GAS & ELECTRIC CO	P O BOX 770000	SAN FRANCISCO CA 94177
33010055	033-010-055	PACIFIC GAS & ELECTRIC CO	P O BOX 770000	SAN FRANCISCO CA 94177
69010016	069-010-016	WYANDOTTE IRRIGATION DIST OROVIL	00000	
33010000	033-010-000			
33010055	033-010-055	PACIFIC GAS & ELECTRIC CO	P O BOX 770000	SAN FRANCISCO CA 94177
33010056	033-010-056	PACIFIC GAS & ELECTRIC CO	P O BOX 770000	SAN FRANCISCO CA 94177
33010054	033-010-054	PACIFIC GAS & ELECTRIC CO	P O BOX 770000	SAN FRANCISCO CA 94177
69010016	069-010-016	WYANDOTTE IRRIGATION DIST OROVIL	00000	
69010016	069-010-016	WYANDOTTE IRRIGATION DIST OROVIL	00000	
69010023	069-010-023	STATE OF CALIFORNIA	P O BOX 388	SACRAMENTO CA 95802
69010019	069-010-019	PACIFIC GAS & ELECTRIC CO	P O BOX 770000	SAN FRANCISCO CA 94177
69010022	069-010-022	STATE OF CALIFORNIA	P O BOX 388	SACRAMENTO CA 95802
69010016	069-010-016	WYANDOTTE IRRIGATION DIST OROVIL	00000	

5. Report on any environmental resources affected by the transmission line construction and operation, encompassing the following resources

- a. Threatened and endangered species (including a statement regarding any impacts to listed species). See Biological Resources Report

Refer to Biological Resources Report and Figure 4: Federally Listed Species and Figure 5: Bio Resources

- b. Recreation resources.

Refer to Figure 5: Recreation and Aesthetics.

The proposed action is located within the State Recreation Area and the project corridor crosses several public use recreational trails, including multi-use, equestrian only, and bike only trails. The Brad Freeman Trail and the Dan Beebe Trail intersect with the Project.

- c. Land management and aesthetics.

The proposed powerlines are located below the dam within the State Recreation Area. Aesthetically, prior to the proposed action, the area was a rural, canyon setting in foothill pine – blue oak woodland. The area is not federally designated as wild and scenic; however, there are multiple trails and view sheds. The aesthetics baseline rapidly shifted with the Incident and now the view sheds are dominated by heavy equipment, large cleared areas, and construction activities.

Specifically, for the Powerline Reroute Project, clearing methods include the following:

No Clearing – No vegetation clearing required or permissible.

Machinery Clearing - Heavy equipment may be used to remove existing vegetation.

Prescriptive #1 – Trees in these areas above 40' should be dropped by chainsaw and limbed in place. Bringing equipment into these areas may create residual damage and should be avoided. Branches will be removed and the tree bole cut to a maximum 24-ft length(s). Upper branched portions of the tree will be removed from the ROW if feasible. Common sense should prevail and tops and branches removed only if they become excessive. Lower tree and shrub species may be retained to provide wildlife cover and foraging habitats, wetland/ water course protection, or aesthetic relief, provided they do not impede ROW access or maintenance activities.

- d. Historical and archaeological resources and documentation or summary of tribal consultation. (Privileged)

Refer to Attachments: [DraftCulturalResourcesReport_TransmissionRelocation Correspondence_Enterprise_Privileged Correspondence_ACHP 2017_Privileged Correspondence_Privileged_OHP 2017a Correspondence_OHP 2017b_Privileged Correspondence_OHP 2017c_Privileged Correspondence_OHP 2017d_Privileged Correspondence_OHP 2017e_Privileged Correspondence_OHP 2017f_Privileged Correspondence_OHP 2017g_Privileged Correspondence_OHP 2017h_Privileged SiteRecords_Far Western 2017a_Privileged SiteRecords_Far Western 2017b_Privileged SiteRecords_Far Western 2017c_Privileged SiteRecords_Stantec 2017a_Privileged SiteRecords_Stantec 2017b_Privileged SiteRecords_Stantec 2017c_Privileged SiteRecords_Stantec 2017d_Privileged](#)

- e. Wetland resources

Refer to Resources Report and Figure 7: Aquatic Resources.

- 6. Copy of the bald eagle take permit issued previously from the U.S. Fish and Wildlife Service.

Refer to Attachment: Emergency Eagle Permit Oroville MB22883C-0 Feb 2017

- 7. Copy of Migratory Bird Treaty Act Permit

Refer to Attachment: 2017.6.8 CA DWR Amended SPRE Permit - Oroville Emergency Spillway 30372C_AMD5

- 8. A copy of the contractor-prepared analysis for the transmission line work. (Contains Critical Energy Infrastructure Information)

Refer to Attachments: [Oroville IFC_trn DWR_20170614_100% 230Kv pkg_CEI](#)

Oroville IFC_30440-STN-00115_CEI
Oroville IFC_30440-STN-00117_CEI
Oroville IFC_30440-STN-00124_CEI
Oroville_230Kv_trn DWR_20170614 60%_CEI
Oroville_230Kv_30440-60%_CEI
Oroville_230Kv_30440-STN-00116-Sagging_Data_rev0A_CEI
Oroville_230Kv_Eagle Nest cross view_CEI

9. Identify the location of any roads or areas created for the transmission line relocation and any impacts to environmental, cultural, or recreation resources associated with these locations, if applicable.

Refer to Figure 8: Access Roads and Environmental Constraints (Contains Critical Energy Infrastructure Information)

In general, the project was designed to use existing roadways. The only new access roads for the powerline are depicted in Figure 8. These were designed to avoid impacts to resources with exceptions noted in the cultural resources report.

Oroville Spillway Emergency Response – Transmission Line Relocation Project Draft Cultural Resources Report



California Department of Water Resources

June 16, 2017

Cultural Resources

Permanent Re-route of Pacific Gas and Electric Company Powerline

Pacific Gas and Electric Company (PG&E) was directed by DWR to permanently re-route their Table Mountain-Palermo 230kV electric transmission within the FERC P-2100 Project boundary. The new line needs to be completed by June 30, 2017 and come on line prior to the summer high electric demand season. Far Western Anthropological Research Group (Far Western)(2017a) a consultant to PG&E, surveyed the proposed re-route corridor on March 20, 2017. Seven previously recorded cultural resources and one new resource were identified within the 150-wide survey corridor. Seven of the eight resources are historic in age and one is a multicomponent site.

Because of the tight time-line and emergency nature of the project and potential to impact the DWR transmission line re-route and spillways repairs schedule, PG&E began work to clear vegetation within the corridor in April 2017. PG&E recognized that construction at one of the proposed tower (008/037) locations could impact two of the resources (P-04-001105 and P-002380) and arranged for archaeological monitors. On April 21, 2017, in a location planned for a new tower, an unanticipated discovery of a prehistoric site was made by a tribal monitor in an area that had been previously surveyed with negative results.

The find was reported to the California State Historic Preservation Officer (SHPO) on April 25, 2017, FERC on April 26, 2017, and the Advisory Council on Historic Preservation (ACHP) on April 27, 2017. On April 26, 2017, the SHPO confirmed that the office would like to be involved. The ACHP responded back on April 27, 2017, indicating they did not have any comments. (OHP 2017a, ACHP 2017)The California Office of Historic Preservation (OHP) had a teleconference with DWR on May 1, 2017, to discuss the new site.

A work plan was prepared for the new site, designated NL-1, by Far Western at PG&E's request (Far Western 2017b). The plan was designed to first assess the nature and extent of archaeological deposits in the area of direct impact and then mitigate effects through data recovery, if necessary, thereby resolving adverse effects per 36 CFR 800.6(a).

DWR and the Tribal Historic Preservation Officer (THPO) for Enterprise Rancheria reviewed the data recovery plan and Enterprise's Tribal Council approved it on May 8, 2017 (Enterprise 2017). The plan was submitted to the SHPO for review and comment on May 8, 2017; and following the submittal of a revised plan, the SHPO indicated no further comments on May 11, 2017 (OHP 2017b, 2017c).

On May 13, 2017, field work at NL-1 commenced with a crew of six archaeologists under the supervision of a field director and a tribal representative. Testing efforts focused on the locations where the proposed work would occur. High-density cultural deposits were identified in some of those locations. DWR applied the criteria of adverse effect per 36 CFR 800.5(a)(1) and determined that placing a transmission tower and

access road through the newly discovered site would impact significant deposits contributing to the site's eligibility and result in an *adverse effect* to a historic property. Data recovery excavation was carried out to address the adverse effect. No human remains or items identified as sacred by the tribal monitor were encountered at the time of excavation. All artifacts and soil samples recovered during field excavations are securely stored on DWR property.

The field completion report (Far Western 2017c), submitted to the SHPO for review and comment on May 24, 2017, was acknowledged by the SHPO on May 25th (OHP 2017f) that it appeared to meet the requirements of the work plan and gave concurrence on the finding of *adverse effect*.

Due to design constraints, PG&E needed to place a transmission tower on the south side of the Thermalito Diversion Pool (TDP) within the boundaries of CA-BUT-1105H, potentially impacting this large mining/habitation site, and also potentially impacting CA-BUT-2380H, a ditch recorded within CA-BUT-1105H. CA-BUT-1105H was recommended as a contributor to a proposed Forks of the Feather River Historic District (FFRHD) under National Register of Historic Places (NRHP) criteria A, C and D as part of the FERC Project No. 2100 relicensing studies conducted in the early 2000s. CA-BUT-2380H was also recommended as a contributor under criteria A and D. Neither was evaluated for individual listing in the NRHP.

PG&E requested Stantec to prepare a data recovery plan (Stantec 2017a), which was submitted to the SHPO for review and comment on May 16, 2017. On May 18, 2017, the SHPO commented on the plan and concurred with a finding of *no adverse effect* under the condition that the proposed work plan is followed. On May 19, 2017, subsequent to the submittal of a revised plan, the SHPO indicated no further comments (OHP 2017d, 2017e).

On May 23, 2017, Stantec completed archaeological presence/absence testing at archaeological sites P-04-001105H and P-04-002380H in the presence of a tribal monitor from Enterprise Rancheria. A surface inspection failed to reveal any cultural constituents within the project footprint. Surface transect unit (STU) excavations resulted in the recovery of artifacts from 4 of the 5 STUs. All artifacts recovered date to the historic era. DWR applied the criteria of adverse effect per 36 CFR 800.5(a)(1) and determined that placing a transmission tower and access road through P-04-001105H and P-04-002380 in this location would not impact significant deposits contributing to the sites' eligibility for listing the National Register, either individually or as contributors to the proposed FFRHD, and would result in a *no adverse effect* finding.

The field completion report was submitted to the SHPO for review and comment on June 1, 2017 (Stantec 2017b). On June 5, 2017, the SHPO acknowledged that the work conducted appeared to meet the agreed upon work plan (OHP 2017g). Concurrence was given on a finding of *no adverse effect*, pursuant to 36 CFR 800.5(b), with the condition that archaeological and tribal monitoring take place during construction and that DWR follow 800.13(b) in the event of any unanticipated discoveries.

California Department of Water Resources - Permanent Re-route of DWR Powerline

The permanent re-route of the DWR Powerline was surveyed on May 1-3, 2017 by Stantec archaeologists (consultant to DWR) and tribal monitors from Enterprise Rancheria. The survey (Stantec 2017c) included approximately 24 acres of DWR's proposed Oroville -Table Mountain 230kV electric transmission line permanent re-route corridor that had not been previously surveyed during the relicensing surveys or by Far Western during their survey for PG&E.

Three new resources and one isolate were recorded and fourteen previously recorded resources were revisited and their pre-construction condition documented. The fourteen previously recorded historic-era cultural resources have not been individually evaluated for the NRHP, but were previously recommended as contributing elements to a proposed FFRHD. The three newly recorded resources will be considered contributing elements to the FFRHD to maintain consistency with DWR's treatment of all resources within the corridor as eligible for the NRHP for the purposes of the project. All of these resources are associated with gold mining, water management, transportation, and settlement activities occurring between the late nineteenth and early to mid-twentieth century.

Ground-disturbing activities at each of the transmission line tower sites will involve vegetation removal, excavation, filling and grading within the boundaries of five resources:

- CA-BUT-2152H: historic (1905-1957) dirt road, 8 feet wide, contributing under A, D
- CA-BUT- 2226H: historic (1905-1957) dirt road, 10 feet wide, contributing under A, D
- CA-BUT-2380H: historic (1848-1916) ditch, 5 feet wide, contributing under A, D
- CA-BUT-1105H: historic (1848-1942) placer mining and occupation complex, contributing under A, C, D
- ORO-3: historic (1880-1945) mining site w/prospecting pits, appears to contribute under A, C, D

DWR made a finding of *no adverse effect* for the re-routing of the transmission lines, consistent with §800.5(b) and §800.13(a)(2), as the undertaking would not alter the characteristics of the resources that qualify them as contributors to the FFRHD.

A data recovery plan (Stantec 2017d) was prepared in the event that significant deposits are identified by archaeological or tribal monitors. If conditions require implementation of the plan to ensure effects are less than adverse, the notification timelines at 36 CFR 800.13(b) will be followed.

The report and plan were submitted separately to the SHPO on June 15, 2015. The SHPO did not object to DWR's finding of *no adverse effect* in a letter on June 16, 2017 (OHP 2017h).

References

Advisory Council on Historic Preservation

2017 RE: Notification of unplanned discovery of archaeological site at Oroville Spillway Emergency area. Email from John Eddins, Archaeologist/Program Analyst, Office of Federal Agency Programs, to Wendy Pierce, Associate Environmental Planner (Archaeology), California, Department of Water Resources. April 27, 2017.

Enterprise Rancheria

2017 Re: Work Plan for Oroville Emergency Work. Email from Reno Keoni Franklin, Tribal Historic Preservation Officer, Estom Yumeka Maidu Tribe of Enterprise Rancheria, to Monica Nolte, Associate Environmental Planner (Archaeology), California, Department of Water Resources. May 8, 2017.

California Office of Historic Preservation (OHP)

2017a RE: Unanticipated Discovery, Oroville Spillway Emergency, Butte County, CA. Letter from Julianne Polanco, State Historic Preservation Officer, to Dean Messer, Division Chief, Division of Environmental Services, California Department of Water Resources. April 26, 2017.

2017b RE: Unanticipated Discovery, Oroville Spillway Emergency, Butte County, CA. Letter from Julianne Polanco, State Historic Preservation Officer, to Dean Messer, Division Chief, Division of Environmental Services, California Department of Water Resources. May 8, 2017.

2017c RE: Unanticipated Discovery, Oroville Spillway Emergency, Butte County, CA. Letter from Julianne Polanco, State Historic Preservation Officer, to Dean Messer, Division Chief, Division of Environmental Services, California Department of Water Resources. May 11, 2017.

2017d RE: Archaeological Data Recovery at Sites CA-BUT-1105H and CA-BUT-2380H, Oroville Spillway Emergency, Butte County, CA. Letter from Julianne Polanco, State Historic Preservation Officer, to Dean Messer, Division Chief, Division of Environmental Services, California Department of Water Resources. May 18, 2017.

2017e RE: Archaeological Data Recovery at Sites CA-BUT-1105H and CA-BUT-2380H, Oroville Spillway Emergency, Butte County, CA. Letter from Julianne Polanco, State Historic Preservation Officer, to Dean Messer, Division Chief, Division of Environmental Services, California Department of Water Resources. May 19, 2017.

2017f RE: Unanticipated Discovery Archaeological Work Plan Implementation Results at Site NL-1, Oroville Spillway Emergency, Butte County, CA. Letter from Julianne Polanco, State Historic Preservation Officer, to Dean Messer, Division Chief, Division of Environmental Services, California Department of Water Resources. May 25, 2017.

2017g RE: Archaeological Testing and Finding of Effect for Sites CA-BUT-1105H and CA-BUT-2380H, Oroville Spillway Emergency, Butte County, CA. Letter from Julianne Polanco, State Historic Preservation Officer, to Dean Messer, Division Chief, Division of Environmental Services, California Department of Water Resources. June 5, 2017.

2017h RE: Oroville Spillway Emergency, Butte County – Powerline Re-routing. Letter from Julianne Polanco, State Historic Preservation Officer, to Gail Kuenster, Chief, Office of Regulatory Compliance, California Department of Water Resources. June 16, 2017.

Far Western Anthropological Research Group

2017a *PG&E Emergency Table Mountain-Palermo 230 kV Electric Transmission Line Permanent Re-route.* Prepared for Pacific Gas and Electric Company, Sacramento.

2017b *Archaeological Data Recovery for the PG&E Emergency Table Mountain-Palermo 230 kV Electric Transmission Line Permanent Re-route.* Prepared for Pacific Gas and Electric Company, Sacramento

2017c *Field Completion Report of Archaeological Boundary Testing and Data Recovery Excavations for the PG&E Emergency Table Mountain-Palermo 230 kV Electric Transmission Line Permanent Re-route.* Prepared for Pacific Gas and Electric Company, Sacramento.

Stantec

2017a *Archaeological Data Recovery For The PG&E Emergency Table Mountain-Palermo 230 kV Electric Transmission Line Permanent Re-Route – Sites CA-BUT-1105H (P-04-001105) and CA-BUT-2380H (P-04-002380H).* Prepared for Pacific Gas and Electric Company, Sacramento.

- 2017b *Field Completion of Presence/Absence Test Excavations at Sites P-04-001105H and P-04-002380H for the PG&E Emergency Table Mountain-Palermo 230kV Electric Transmission Line Permanent Re-route.* Prepared for Pacific Gas and Electric Company, Sacramento
- 2017c *California Department of Water Resources Oroville Emergency Recovery Powerline Project Cultural Resources Survey and Pre-Construction Site Assessment Report.* Prepared for California Department of Water Resources, Sacramento.
- 2017d *Work Plan and Research Design: Archaeological Data Recovery For The DWR Emergency Table Mountain 230kV Electric Transmission Line Permanent Re-Route – Sites CA-BUT-1105H (P-04-001105) and ORO-3.* Prepared for California Department of Water Resources, Sacramento.

Document Content(s)

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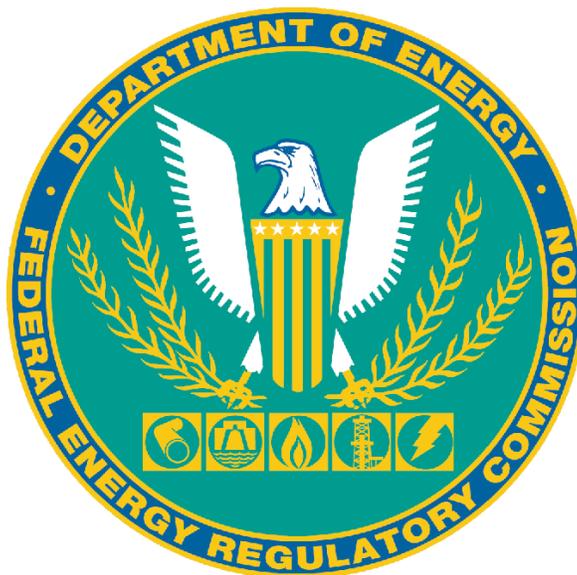
Attachment 5

Environmental Assessment

ENVIRONMENTAL ASSESSMENT

**AMENDMENT OF PROJECT LICENSE TO REROUTE PRIMARY
TRANSMISSION LINE**

FEATHER RIVER HYDROELECTRIC PROJECT
FERC No. 2100-180
California



Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Administration and Compliance
888 First Street, N.E.
Washington, DC 20426

August 2017

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ACRONYMS

Advisory Council	Advisory Council on Historic Preservation
APE	Area of Potential Effect
Army Corps	U.S. Army Corps of Engineers
California DWR	California Department of Water Resources
California SHPO	California State Historic Preservation Officer
Commission or FERC	Federal Energy Regulatory Commission
CWA	Clean Water Act
DO	Dissolved Oxygen
EA	Environmental Assessment
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FWS	U.S. Fish and Wildlife Service
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
PG&E	Pacific Gas and Electric Company
Section 106	Section 106 of the National Historic Preservation Act
Section 401	Section 401 of the Clean Water Act
Section 7	Section 7 of the Endangered Species Act
401 certification	Water Quality Certification under Section 401 of the Clean Water Act

ENVIRONMENTAL ASSESSMENT

**Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Administration and Compliance
Washington, DC**

Feather River Hydroelectric Project FERC No. 2100-180

1.0. APPLICATION

Application Type: Amendment of Project License

Date Filed: May 17, June 16, and June 20, 2017

Applicant's Name: California Department of Water Resources

Water Body: Feather River

County and State: Butte County, California

Federal Lands: The project occupies Federal Lands administered by the U.S. Forest Service and U.S. Bureau of Land Management

2.0 PURPOSE OF ACTION

The California Department of Water Resources (California DWR), licensee for the Feather River Project, requests an amendment to its project license to permanently reroute its primary transmission lines originating from the Hyatt Pumping-Generating Plant. The project's emergency spillway and main spillway at Oroville Dam near the plant were damaged by flooding in February 2017. The relevant segment of the primary transmission lines, which are aligned together, currently crosses the faces of both damaged spillways. The proposed permanent reroute of the transmission lines is necessary to facilitate access to and repair of the damaged sites, and to prevent future damage to the transmission lines by moving them away from the spillway paths. The licensee is currently using a temporary electrical line routed partially around the repair sites to transmit power generated from the Hyatt Pumping-Generating Plant.

3.0. BACKGROUND

In February 2017, abnormally heavy precipitation resulted in high flows in the Feather River basin that caused extensive erosion and damage to the main spillway and

emergency spillway at the Feather River Project's Oroville Dam. California DWR first observed major damage to the main spillway on February 7, 2017. Due to high inflows into Lake Oroville and reduced outflow capacity on the main spillway, Lake Oroville overtopped the adjacent emergency spillway on February 11, 2017, which resulted in back-cutting erosion on the emergency spillway that threatened the stability of the emergency spillway's crest structure. Unavoidable increased operation of the main spillway led to the loss of the lower portion of the spillway chute and caused significant erosion in the vicinity of the spillway failure site.

Since that time, California DWR has implemented numerous emergency recovery actions including temporarily relocating transmission lines, dredging in the diversion pool, removing sediment in the vicinity of the main spillway, establishing site access, and initiating early stages of reconstruction of the spillways. To ensure public safety, California DWR must complete emergency response and recovery activities before seasonal rainfall beginning in November may necessitate the use of the main or emergency spillways.

This environmental assessment analyzes the action of California DWR permanently rerouting its primary transmission line away from the area of the project spillways and ongoing construction activities. California DWR must ensure that the primary transmission lines can reliably and permanently transmit electricity from the Hyatt Pumping-Generating Plant during the repair of the damaged sites. The plant must generate power as it passes flows, and the plant must continuously pass flows out of Lake Oroville while the damaged spillways are out of service. The inability to transmit electricity from the plant, and the resulting inability to pass flows, could lead to rising water levels in Lake Oroville that may necessitate the premature use of the main or emergency spillways before repairs are complete.

3.1 Feather River Project Description

The Commission issued a 50-year license for the Feather River Project on February 11, 1957,¹ which expired on January 31, 2007. The project has been operating on an annual license since February 1, 2007.² The project is located on the Feather River in Butte County, California, and encompasses 41,540 acres (Figure 1). The project includes three power plants, two on-river impoundments, and two off-river impoundments. California DWR's proposal to permanently reroute its transmission lines will occur in the vicinity of the 770-foot high Oroville Dam, which impounds the 15,810-

¹ *Dep't of Water Res. of the State of Cal.*, 17 FPC 26.

² *See* Notice of Authorization for Continued Project Operation, issued February 1, 2007 in Project No. 2100-000.

acre Lake Oroville. Flows can pass out of Lake Oroville in one of four ways: through the six-unit, 645-megawatt (MW) Hyatt Pumping-Generating Plant; through the gated main spillway; over the ungated emergency spillway; or through the low-level river outlet valve. Flows pass into the 320-acre Thermalito Diversion Pool, which is impounded by the 143-foot-high Thermalito Diversion Dam located about four miles downstream. Other project features include: the Thermalito power canal leading off-river to the Thermalito forebay and forebay dam; Thermalito Pumping-Generating Plant, and Thermalito afterbay and afterbay dam; the Feather River Fish Hatchery and fish barrier dam; the Oroville Wildlife Area; transmission lines, and a number of recreational facilities.³

³ See a detailed description of the project's facilities and operation in the Final Environmental Impact Statement for the Oroville Facilities Project, issued May 18, 2007, in Project No. 2100-052, at pages 13 through 25.

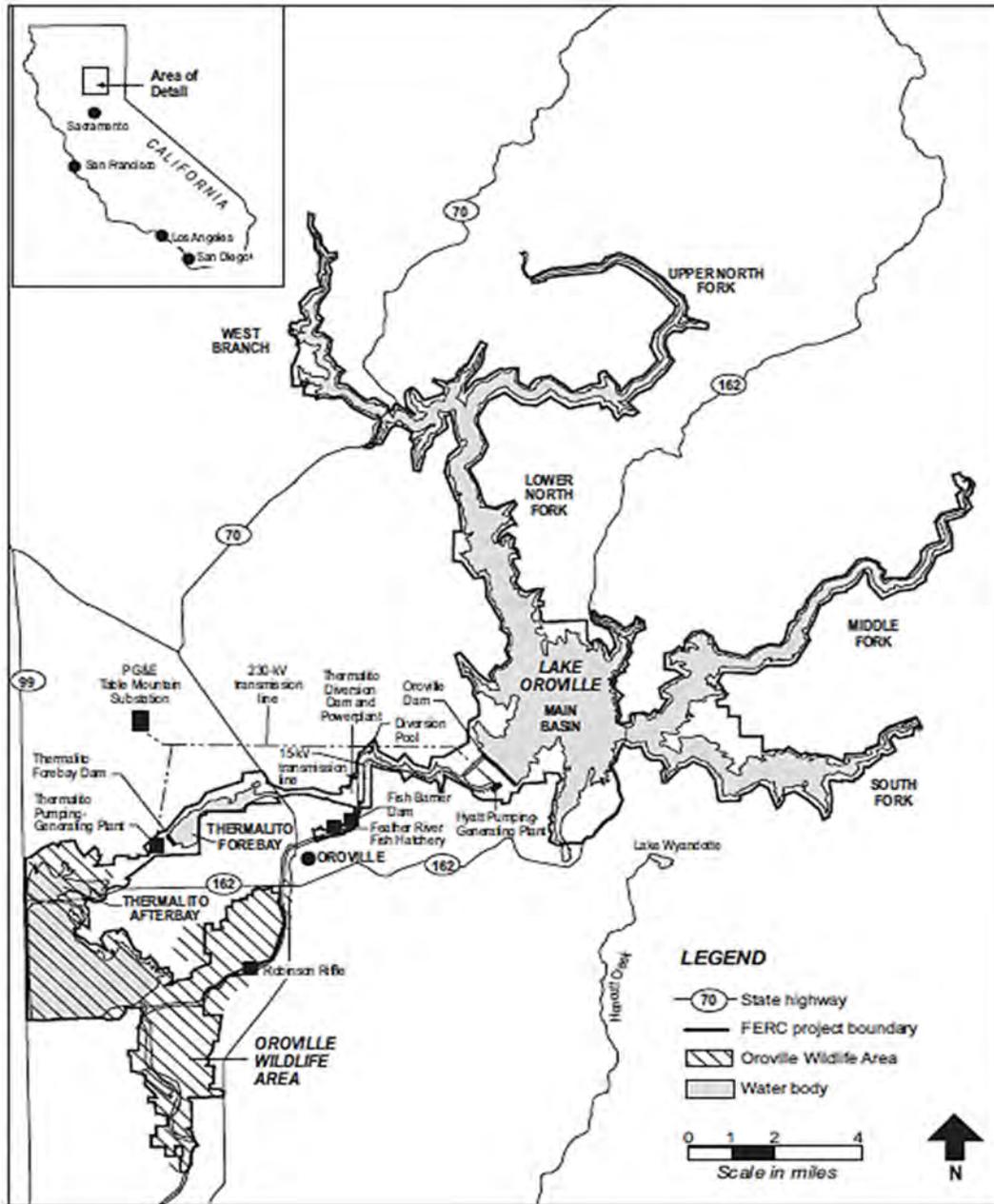


Figure 1. Location of the Feather River Project facilities

4.0 PROPOSED ACTION AND ALTERNATIVES

4.1 Proposed Action

The California DWR requests an amendment to its project license to permanently reroute three primary transmission lines supported by dual towers around the emergency and main spillway areas, which are currently undergoing repair efforts following a February 7, 2017 failure of the main spillway. The original alignment of the transmission lines travelled from the Hyatt Pumping-Generating Plant in a northwest direction across the Feather River (impounded in this area as the Thermalito Diversion Pool) and across the faces of both spillway areas to then turn due west toward the Table Mountain substation, located approximately 7 miles away. The rerouted transmission line would deviate from the existing route at a point approximately 1,300 feet northwest of the power plant after the existing river crossing. The reroute would travel approximately 4,000 feet to the southwest, crossing over the Feather River a second time below the Oroville dam. The reroute would then turn to the northwest to follow the existing non-project Table Mountain–Palermo transmission line roughly parallel to the river for 3,000 feet. Last, the reroute would turn again to the northeast and travel approximately 3,500 feet, crossing back over the river a third time. The final segment would travel approximately 500 feet in a northwest direction, and rejoin the existing route at a point west of the emergency spillway. The new transmission line segment would be approximately 11,000 feet long in total.

In order to construct the proposed lines, the California DWR would need to clear an approximately 300-foot-wide corridor (75 feet on either side of the three circuit lines) along the approximately 2-mile-long reroute corridor from the Hyatt Pumping-Generating Plant to the tie-in point with the existing Oroville–Table Mountain 230-kV Transmission Line. Clearing, vegetation removal, and mulching proposed by the licensee will be done primarily with a track-mounted hydraulic masticator, unless otherwise noted on the plans and specifications. The maximum depth of disturbance for vegetation removal activities will be approximately two feet.

To facilitate the proposed work, California DWR is using existing roads where available, but also proposes to construct 13 new road segments. The new segments will be approximately 15 feet wide and will total 2,003 linear feet. The maximum depth of land disturbance associated with the access roads will be 20 feet. Additionally, California DWR proposes four stringing and staging areas, within 4.11 acres of the right-of-way. The maximum depth of land disturbance for stringing and staging areas will be approximately 2 feet.

To support construction staging at the tower locations, California DWR proposes a total of 16 work pads, measuring approximately 50 feet by 70 feet. California DWR also proposes to use 14 additional crane pads, constructed within 45 feet of each tower, and

measuring 40 feet by 40 feet. Each pad will require cut/fill grading of the surrounding area to account for surface drainage and the crane pads.

The new alignment would contain 22 new permanent steel transmission line structures, which will be located on California DWR and Pacific Gas and Electric Company (PG&E) property. The foundations of each transmission line tower will require surface grading within a 35 radius of the tower center and six-foot-diameter excavations at four locations, with varying depths depending on site conditions but not to exceed a depth of 30 feet. The height of the tower will vary from site to site with a minimum of 100 feet and a maximum of 160 feet.

The licensee states that it would secure the necessary easements for the work from PG&E and file revised project boundary and exhibit maps to reflect the new alignment.

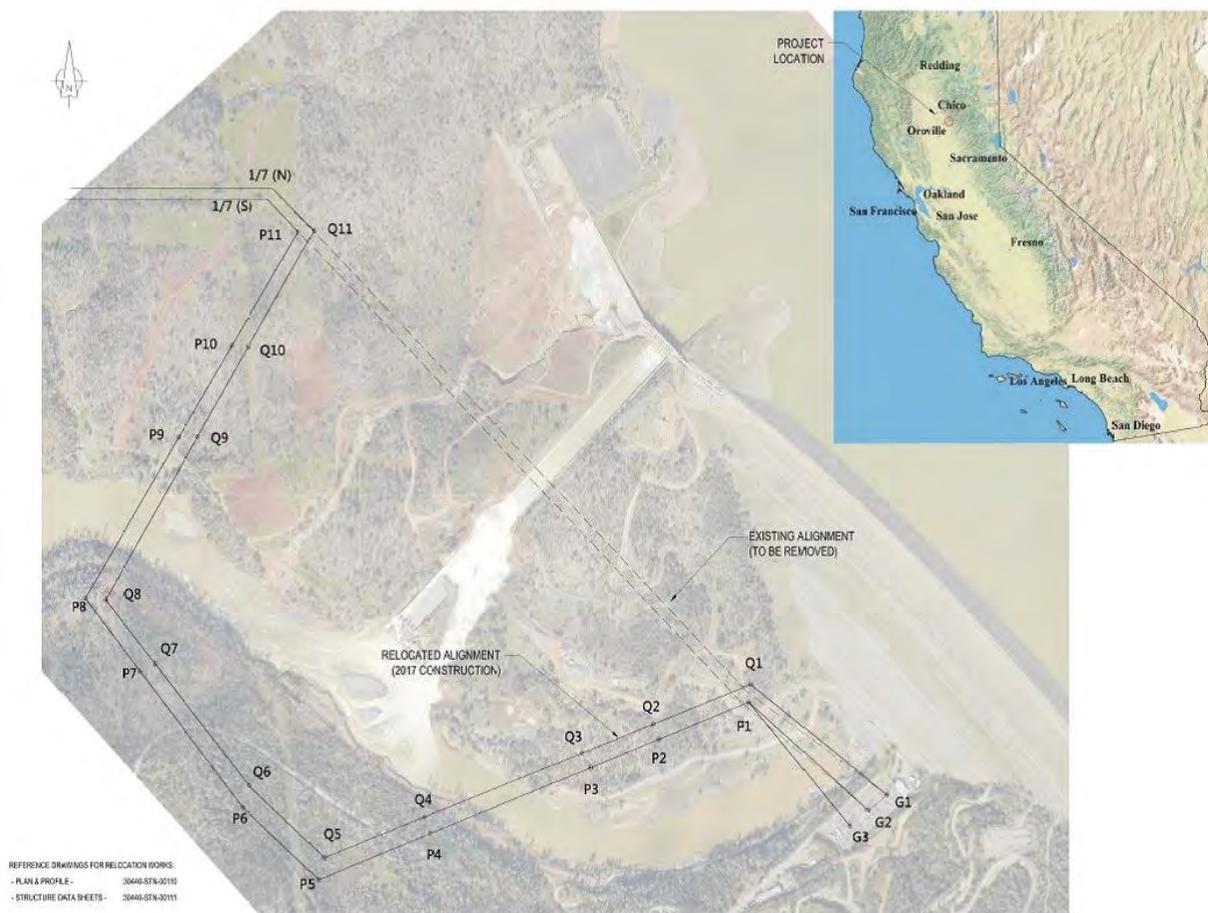


Figure 2. Proposed Realignment of Primary Transmission Lines from Hyatt Pumping-Generating Plant (source: California DWR).

4.2 Other Action Alternatives

No reasonable action alternatives to the California DWR's proposal have been presented by the California DWR or identified by Commission staff. California DWR has selected a reroute alignment that accounts for design constraints associated with the existing topography and limited sites for tower placement and possible interference with other existing electrical lines in the area. An alternative to reroute the transmission lines to run along the crest of Oroville Dam and both spillways will not satisfy the purpose and need for action because planned repairs in the spillway areas include fortifications to the emergency spillway. A transmission line would obstruct these repairs. An alternative to reroute the transmission lines to run upstream of the dam and spillways, over Lake Oroville, is not practical to meet the urgent construction timeline because this alternative would require the complex construction of support pilings and towers in the reservoir. An alternative to reroute the transmission lines to run closer to the Thermalito Diversion Pool's southern bank (i.e., slightly north of California DWR's proposed route) would potentially disturb more sensitive habitat along the bank, threatening specialized plants and wildlife and threatening water quality. An alternative to reroute the transmission lines to run farther from the pool's southern bank (i.e., farther south of the proposed route) would require a longer transmission corridor and possibly more support towers, which would result in more ground-disturbing construction on a larger quantity of crossed (and possibly privately held) lands. This alternative would also interfere with a separate action by PG&E to reroute its Table Mountain–Palermo transmission line in the same area.⁴ We therefore conclude that any alternative route alignment would not be feasible due to physical limitations associated with the existing topography, important timelines, additional environmental concerns, and other electrical lines in the vicinity.

4.3 No-Action Alternative

Under the no-action alternative, the California DWR would continue to operate the Hyatt Pumping-Generating Plant using the temporary transmission lines installed following the February main spillway failure. The temporary lines would physically obstruct planned construction activities at the main and emergency spillway sites and would be subject to damage in the event that California DWR activates the emergency spillway in the future. The temporary lines would also need to eventually be replaced, making a long-term solution preferable. Nonetheless, under a no-action alternative, environmental resources in the project area would remain the same as they are described in the Affected Environment sections of the *Environmental Analysis* below.

⁴ Order Approving Non-Project Use of Project Lands and Amending License, 160 FERC ¶ 62,118 (issued August 2, 2017).

5.0 CONSULTATION AND COMPLIANCE

5.1 Background

The California DWR developed its proposal in consultation with the U.S. Fish and Wildlife Service (FWS), California Department of Fish and Wildlife, U.S. Army Corps of Engineers (Army Corps), California State Historic Preservation Officer (California SHPO), and the Enterprise Rancheria of Maidu Indians of California (Enterprise Rancheria). The FWS issued a take permit for bald eagle (*Haliaeetus leucocephalus*) under the Bald and Golden Eagle Protection Act on February 17, 2017, that is effective through August 31, 2017. The FWS also issued a permit under the Migratory Bird Treaty Act on June 8, 2017, that is effective through March 31, 2018. Following consultation with the Army Corps, California DWR determined that the proposal would not affect navigable waters and that a permit under section 404 of the Clean Water Act was not necessary. The Commission developed a Programmatic Agreement (PA) with the California SHPO, California DWR, the California Governor's Office of Emergency Services (California OES) and the Federal Emergency Management Agency (FEMA) for the management and protection of cultural resources. The PA was executed on July 5, 2017, by signatures from the Commission and California SHPO. FEMA is an invited signatory and California DWR, the California OES, and the Enterprise Rancheria are concurring parties to the agreement.

5.2 Statutory Compliance

5.2.1 Section 401 Water Quality Certification

Under section 401 of the federal Clean Water Act, an applicant for a federal license or permit to conduct any activity which may result in any discharge into the navigable waters must obtain a water quality certification from the appropriate state pollution control agency verifying that the activity would not violate water quality standards.⁵ Here, the proposed reroute alignment will cross above the Thermalito Diversion Pool but is not expected to result in any discharge to navigable waters. Therefore, the proposed action does not require a water quality certification.

⁵ 33 U.S.C. § 1341(a)(1) (2012).

5.2.2 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally-listed threatened or endangered species or result in the destruction or adverse modification of the critical habitat of such species.⁶ There is no critical habitat in the proposed work area for any known federally-listed species. Based upon the detailed analysis below in section 6.5-Threatened and Endangered Species, we conclude that the proposed action would have no effect on federally-listed species.

5.2.3 National Historic Preservation Act

Under section 106 of the NHPA, and its implementing regulations, federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.⁷ In a letter to the California SHPO dated March 31, 2017, the Commission designated California DWR as its non-federal representative for conducting informal, day-to-day consultations under section 106 of the NHPA for the identification, evaluation, and determination of effects to historic properties arising from the proposed transmission line reroute.

Pursuant to that designation, the California DWR consulted with the California SHPO on June 15, 2017 on its proposal and potential disturbances to known cultural sites. By letter dated June 16, 2017, the California SHPO stated that if California DWR follows several measures during construction to avoid potential adverse effects to historic sites, then California SHPO does not object to the cultural resource determination made by the California DWR within the footprint of the proposed transmission line reroute. The PA mentioned above includes provisions for the identification and management of potential effects to historic properties arising from transmission line relocations. Up until the PA was executed, California DWR had been consulting with the California SHPO as the Commission's non-federal representative under the emergency provision of section 106.

⁶ 16 U.S.C. § 1536 (2012).

⁷ 54 U.S.C. § 306108 (2012); 36 C.F.R. Part 800 (2017).

6.0 ENVIRONMENTAL ANALYSIS

6.1 Scope of the Analysis

The geographic scope of this analysis is limited to California DWR's proposed 2-mile-long transmission line reroute, beginning at the base of Oroville Dam on the north bank of the Thermalito Diversion Pool, extending to the south bank of the diversion pool opposite the damaged spillway areas, and returning back across the diversion pool to a tie-in point with the existing Oroville–Table Mountain 230-kV Transmission Line just west of the emergency spillway. The temporal scope of this environmental analysis focuses on the period from the start of site preparation in April 2017, followed by construction beginning in August 2017, and continuing through the transmission lines' perpetual existence thereafter. The resources potentially affected by this proposal include water quality and aquatic resources, terrestrial resources, threatened and endangered species, cultural resources, recreation, land use, and aesthetic resources.

6.2 General Description of the Project Area

The project is located on the Feather River in Butte County, California. The area of the proposed transmission line reroute would cross lands owned by California DWR and PG&E. The proposed route would encompass lands within and outside of the current project boundary, and would cross the Thermalito Diversion Pool at two new locations.

6.3 Water Quality and Aquatic Resources

6.3.1 Affected Environment

The proposed transmission line reroute would cross over the Thermalito Diversion Pool at two new locations. Water quality in the diversion pool is generally good, and is a function of water quality in Lake Oroville and its releases. As a result of nearly constant flow releases from Oroville Dam and Hyatt Pumping-Generating Plant, water temperatures are generally cool and undergo very little stratification. Turbidity levels are also generally low, due to the majority of sediments settling out in Lake Oroville, upstream of the diversion pool. Nonetheless, several highly elevated turbidity events have occurred recently, due to severe erosion in the vicinity of the main and emergency spillways, following the February 7, 2017 damage to the main spillway. In addition,

dissolved oxygen (DO) and pH levels at the project generally comply with the 7.0 milligrams per liter DO and 6.5 to 8.5 pH objectives of the Basin Plan.⁸

Historically, the Thermalito Diversion Pool fishery has been a predominantly cold water fishery, consisting of rainbow trout, brook trout, brown trout, and Chinook salmon. The diversion pool also contains several native and non-native species, including common carp, golden shiner, Sacramento pikeminnow, Sacramento sucker, wakasagi, prickly sculpin, bluegill, black crappie, largemouth bass, smallmouth bass, and tule perch. However, the diversion pool fish community and abundance may have been significantly altered by the exceptionally high flows, turbidity levels, and dredging activities following the main spillway failure.

6.3.2 Environmental Effects

As discussed above, the proposed transmission line reroute would cross over the diversion pool at two new locations. The water crossing would not necessitate any in-water work or construction of any in-water structures and the proposed support towers for the lines would be constructed at least 300 feet from the diversion pool, such that no sediment or other construction debris would enter the diversion pool. In addition, most of the proposed staging areas and access roads are located away from streams and the diversion pool. However, the licensee proposes to maintain a vegetation buffer zone near any riparian areas to prevent any potential sedimentation to watercourses. Therefore, the proposed transmission line work would have little to no effect on water quality or aquatic resources.

⁸ The Basin Plan is a broad water quality control plan created by the California Regional Water Quality Control Board to achieve state water quality standards in conformance with the Clean Water Act.

6.4 Terrestrial Resources

The Feather River Project is located within the Sacramento Valley and Sierra Nevada Foothills. Vegetation in this area differs with elevation changes from the valley floor (elevation 100 feet above mean sea level at the lower end of the Oroville Wildlife Area) to the upper elevation of the mountain range (about 1,200 feet above mean sea level). The vegetation changes from valley grasslands to foothill woodlands (characterized by blue-oak /foothill pine woodlands with varying amounts of chaparral) to mixed conifer forests in the higher elevations. The proposed transmission line reroute corridor is located on roughly 82 acres of land owned by California DWR and PG&E. The transmission line reroute corridor is located within a rural, foothill environment classified as a State Recreation Area.

6.4.1 Affected Environment

The lands around Lake Oroville and the Diversion Pool are mostly composed of open to dense woodland, forest, and chaparral communities consisting of mixed oak woodlands, foothill pine/mixed oak woodlands, and oak/pine woodlands and chaparral. Primary species include interior and canyon live oaks, blue oak, and foothill pine. The open areas within the woodlands consist of annual grassland species. Also found around the Thermalito Diversion Pool is scrub vegetation, consisting of mostly chaparral vegetation, which is characterized by evergreen, tough waxy leaves. Common chaparral species include whiteleaf manzanita, buckbrush, toyon, and scrub oak. Downstream of Oroville Dam and the Thermalito Diversion Pool, vegetation around open waters of the off-river Thermalito Complex (including a forebay, power plant, and afterbay) include emergent wetland types with annual grasslands on the surrounding slopes.

A total of 219 species of non-native plants were identified within the project boundary during relicensing surveys conducted in 2002 and 2003. Of these species, 39 are target species identified as noxious or invasive plants by the California Department of Food and Agriculture, California Invasive Plant Council, US Department of Agriculture, and the Plumas National Forest. The largest concentration of noxious or invasive species is located within the Oroville Wildlife Area, outside of the proposed transmission line reroute corridor but in close proximity to the proposed project work. However, noxious and invasive species also occur in areas with existing land disturbance near roads, trails, and in the immediate vicinity of the spillway and power facilities. Similar land disturbance will occur within the proposed transmission line reroute corridor.

Terrestrial species in and around the proposed transmission line corridor include mountain lions, raccoons, turkeys, opossums, coyotes, tree and ground squirrels, rabbits, deer, skunks, ringtails, bears, and many species of birds native to the area. The proposed transmission line reroute area supports a diverse number of migratory birds that travel through the area for breeding, migrating, and wintering. The area is also known to provide year-round habitat for several species of migratory birds.

Commission staff accessed FWS' Information for Planning and Consultation system on June 27, 2017, and generated the following list of birds protected under the Migratory Bird Treaty Act that are likely to occur within the proposed transmission line reroute corridor:

Common Name	Scientific Name	Season(s)
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Year-round
Black Rail	<i>Laterallus jamaicensis</i>	Breeding
Black Swift	<i>Cypseloides niger</i>	Breeding
Burrowing Owl	<i>Athene cunicularia</i>	Year-round
California Spotted Owl	<i>Strix occidentalis</i>	Year-round
Calliope Hummingbird	<i>Stellula calliope</i>	Breeding
Flammulated Owl	<i>Otus flammeolus</i>	Breeding
Fox Sparrow	<i>Passerella iliaca</i>	Wintering
Green-tailed Towhee	<i>Pipilo chlorurus</i>	Breeding
Lewis's Woodpecker	<i>Melanerpes lewis</i>	Wintering
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Year-round
Long-billed Curlew	<i>Numenius americanus</i>	Wintering
Nuttall's Woodpecker	<i>Picooides nuttallii</i>	Year-round
Oak Titmouse	<i>Baeolophus inornatus</i>	Year-round
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Breeding
Peregrine Falcon	<i>Falco peregrinus</i>	Wintering
Rufous Hummingbird	<i>Selasphorus rufus</i>	Migrating
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	Year-round
Short-eared Owl	<i>Asio flammeus</i>	Wintering
Snowy Plover	<i>Charadrius alexandrinus</i>	Breeding
Swainson's Hawk	<i>Buteo swainsoni</i>	Breeding
Western Grebe	<i>Aechmophorus occidentalis</i>	Wintering
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	Year-round
Yellow-billed Magpie	<i>Pica nuttalli</i>	Year-round

There is an inactive bald eagle nest located within the proposed transmission line reroute corridor on PG&E land in close proximity to the current Feather River Project boundary. California DWR confirmed that neither the adult nor the juvenile eagles are utilizing the nest at this time. This area of PG&E land will be incorporated into the

project boundary as part of this application. Bald eagles have been removed from the list of threatened and endangered species since 2007 but are still protected at the federal level under the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act. As detailed in the Commission's Final Environmental Impact Statement (FEIS) for the relicensing of the Feather River Project, California DWR previously implemented conservation measures as a result of its draft programmatic biological assessment for terrestrial species.⁹ These measures, designed to protect bald eagle nesting territories by prohibiting human activity near the nests, include: (1) administrative closure of land and shoreline areas to human entry during the nesting season around the four bald eagle nest territories; (2) signage, patrol, and enforcement of closure; (3) nest and population surveys; (4) habitat improvement measures; and (5) limitations on current and future habitat disturbance. The FEIS also states that California DWR prepared and implemented bald eagle territory management plans for four bald eagle nest territories which were active on or within 0.25 mile of project lands.¹⁰

⁹ FEIS at 174 (citing California DWR, *Programmatic biological assessment for terrestrial and non-anadromous species, Oroville Facilities, FERC Project No. 2100* (May 2004)).

¹⁰ *Id.*

6.4.2 Environmental Effects

Construction of the proposed transmission line reroute would temporarily, and in places, permanently disturb land and vegetation within the footprint of the 2-mile-long transmission line reroute corridor on a total of 82 acres. Construction preparation for the 22 transmission line towers includes grading land within a 35-foot radius of each tower center and creating four six-foot-diameter excavations to varying depths (not to exceed a depth of 30 feet). The proposed construction would temporarily disturb and displace vegetation, wildlife, and avian species. This would occur primarily during vegetation clearing and grubbing activities; constructing work pads, crane pads, staging areas, and access roads; installing poles; and wire-tensioning activities. The construction preparation for the towers is likely to cause noise and vibrations which would cause disturbed local wildlife to temporarily relocate to the surrounding areas. The permanent transmission lines have the potential to affect avian bird species within the project area.

Generally, land-clearing activities have the potential to cause loss of wildlife habitat, noise, vibration, dust, and increased potential for vehicle collisions and other human interactions with wildlife. The construction of additional access roads and vehicular traffic necessary during construction of the transmission line reroute will increase human presence and noise, which may have added effects on local wildlife. The clearing of vegetation both for the right-of-way and the work/crane pads has the potential to disturb nesting birds and disturb or destroy animal burrows and habitat. Disturbance and removal of existing vegetation for any of the proposed construction activities also has the potential to create conditions conducive to the introduction and spread of invasive plant species, which could out-compete and displace native species, thereby reducing biodiversity and altering compositions of existing native communities.

The licensee proposes two vegetation clearing methods. It will couple machinery clearing with prescriptive measure no. 1, which the licensee defines as felling trees over 40 feet tall and removing the timber outside of the right-of-way if necessary. The licensee plans to leave shorter tree and shrub species in place to provide wildlife cover and foraging habitats, wetland protection, and aesthetic relief, provided that these trees and shrubs do not impede right-of-way access or maintenance activities. The licensee also proposes to minimize clearing in riparian areas and to leave a vegetative buffer zone along streams to minimize adverse impacts to these areas.

While it is not possible to completely eliminate all direct and indirect effects on terrestrial resources regarding vegetation clearing and other ground-disturbing activities, there should be an effort to reduce disturbance as much as possible. As discussed above, because the machinery and vehicles used during land-clearing activities have the potential to introduce and spread invasive or noxious plant species, California DWR and its contractors should use best management practices to reduce these potential effects. To mitigate for the loss of vegetation and wildlife habitat, California DWR and its

contractors should evaluate applicable areas post-construction for the introduction of nonnative, invasive species that may have developed within disturbed areas. California DWR and its contractors should remove undesirable plant species and reseed the area with native plant, grass, and tree species that are currently present in the surrounding areas. A Revegetation Plan would allow the licensee to review the effects of the proposed work and return the project area to pre-construction conditions, in particular where the licensee removed all vegetation via machinery and graded the land, such as the work/crane pads and staging areas. California DWR's use of these post-construction mitigation measures would help to alleviate both short- and long-term effects on the vegetative environment and wildlife habitat.

The construction and permanent location of the proposed transmission line reroute may increase avian collision and electrocutions during flight and foraging if measures are not taken to ensure the newly constructed lines include protections to avoid or minimize these effects. Migratory birds may also come into contact with transmission lines and associated structures during flight, foraging, roosting, and nesting.

To minimize the effects of the construction and operation of the proposed transmission line reroute on avian resources, the FWS's June 8, 2017 Migratory Bird Treaty Act Permit includes provisions for California DWR to live-trap and relocate specific avian nests, requirements to place young/eggs into foster nests or to transport them to a licensed wildlife rehabilitator, and measures for preventing nest establishment for the duration of the construction of the proposed transmission line reroute. California DWR's June 20, 2017, filing included plans and specification drawings for the proposed transmission line, which incorporates the requirements of the FWS' Migratory Bird Treaty Act Permit. The licensee has accounted for some effects to birds by integrating visible bird diverters into its transmission line design over water crossings and in the vicinity of a regular bald eagle nesting tree. The review and incorporation of additional measures to protect avian species during and post-construction, such as those found in the FWS' and Avian Power Line Interaction Committee guidelines,¹¹ would further protect avian species during and after construction of the transmission line.

The FWS's February 1, 2017 Bald Eagle Take Permit authorizes the California DWR to disturb bald eagles within one mile of the Glen Pond Bald Eagle Breeding

¹¹ *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*, [http://www.aplic.org/uploads/files/2613/SuggestedPractices2006\(LR-2watermark\).pdf](http://www.aplic.org/uploads/files/2613/SuggestedPractices2006(LR-2watermark).pdf), *Reducing Avian Collisions with Power Lines: State of the Art in 2012*, http://www.aplic.org/uploads/files/15518/Reducing_Avian_Collisions_2012watermarkLR.pdf, and the FWS' *National Bald Eagle Management Guidelines* (May 2007), <https://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf>

Territory during emergency repair and construction activities of the Lake Oroville Dam's emergency spillway for the 2017 breeding season (February through August). The permit requires that California DWR install flight diverters near the known nest and where the line crosses the waterway. The permit also requires that California DWR monitor the bald eagle nest for three years following the emergency activities to determine the disturbance effect to the Glen Pond breeding territory. California DWR provided additional information on August 9, 2017, stating that the tree where the bald eagle nest is located on the south bank of the diversion pool has been identified as a hazardous during a hazard tree analysis conducted for the new transmission line location. As such, California DWR will be submitting an application for a Take Permit under the Bald and Golden Eagle Protection Act from the FWS, for authorization to remove the tree. California DWR states it will not remove the tree until it receives the permit from the FWS. Once California DWR receives the permit it will file a copy with the Commission as part of the records for the proposed transmission line work.

While there will be temporary adverse effects to vegetation and wildlife, sufficient habitat exists in the areas immediately surrounding the project construction area, such that the majority of wildlife and avian species are expected to temporarily disperse to less disruptive locations. Construction-specific effects will be temporary and would not create long-lasting adverse effects. If implemented, the proposed measures listed above would reduce the overall effect on terrestrial resources within the proposed project area.

6.5 Threatened and Endangered Species

6.5.1 Affected Environment

The California DWR's June 15, 2017 filing, as part of its amendment application, includes a list of the potential federally-listed species that may occur in the proposed project boundary as determined during the relicensing proceeding and supplemented with data from the California Natural Diversity Database. Commission staff accessed the FWS' Information for Planning and Consultation system on June 27, 2017, and did not find any additional species known or with the potential to occur within the proposed project area. The table below provides a list of the federally-listed species that may occur in the proposed transmission line area and amended project boundary.

Common Name	Scientific Name	Federal Status
Wildlife		
Vernal pool tadpole shrimp	<i>Lepidurus packardi</i>	Endangered
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	Endangered
Giant garter snake	<i>Thamnophis gigas</i>	Threatened
California red-legged frog	<i>Rana draytonii</i>	Threatened
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Threatened
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	Threatened
California tiger salamander	<i>Ambystoma californiense</i>	Threatened
Southern Bald Eagle	<i>Haliaeetus leucocephalus</i>	Delisted
Plants		
Butte County meadowfoam	<i>Limnanthes floccosa</i> ssp. <i>Californica</i>	Endangered
Green's tuctoria	<i>Tuctoria greenei</i>	Endangered
Hairy Orcutt grass	<i>Orcuttia pilosa</i>	Endangered
Hoover's spurge	<i>Chamaesyce hooveri</i>	Threatened
Layne's ragwort	<i>Senecio layneae</i>	Threatened
Slender Orcutt grass	<i>Orcuttia tenuis</i>	Threatened
Fish		
Sacramento River winter-run Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Endangered
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	Threatened
Delta Smelt	<i>Hypomesus transpacificus</i>	Threatened
Central Valley spring-run Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Threatened
Southern Distinct Population Segment – North American Green sturgeon	<i>Acipenser medirostris</i>	Threatened
Central California Coast steelhead	<i>Oncorhynchus mykiss</i>	Threatened

6.5.2 Environmental Effects

The FWS issued a Biological Opinion on April 9, 2007, that addressed the effects of issuing a new license for the Feather River Project on federally-listed threatened and endangered species.¹² The Biological Opinion states that the Feather River Project is not located within critical habitat for any federally-listed species under the jurisdiction of the FWS. The National Marine Fisheries Service issued a separate Biological Opinion on December 5, 2016, which identified critical habitat for Central Valley spring-run Chinook salmon, California Central Valley steelhead, and the Southern distinct population segment of North American green sturgeon in the Feather River extending upstream to the fish barrier dam, but no farther.¹³

California DWR conducted habitat surveys during the relicensing process for the Feather River Project; California DWR reviewed those surveys to determine the potential for threatened and endangered species' critical habitat to occur within the area of the transmission line reroute. No habitat exists in the proposed project area for any of the federally-listed species, neither terrestrial nor aquatic. Because there are no vernal pools within the transmission line reroute corridor, no habitat exists for the federally-listed vernal pool invertebrates—vernal pool tadpole shrimp, Conservancy fairy shrimp, and vernal pool fairy shrimp. Because there will be no in-water work associated with the proposed transmission line reroute, federally-listed aquatic species would not be affected. Because the transmission line reroute corridor and the surrounding area provides no habitat for the federally-listed threatened and endangered species, the project will have no effect on the 20 species listed above.

¹² The FWS Biological Opinion was filed with the Commission on April 16, 2007, under Project No. 2100-000.

¹³ The NMFS's Biological Opinion was filed under Project No. 2100-134.

6.6 Cultural and Historic Resources

A comprehensive overview of cultural resources located within the Feather River Project area, including the prehistory and history of the Feather River and Lake Oroville, along with other supporting documents can be found in California DWR's January 26, 2005 application to relicense the project. Additional information and staff analyses can be found in the Final Environmental Impact Statement for the relicensing, dated May 18, 2007.¹⁴

6.6.1 Affected Environment

In addition to cultural resources identified during relicensing studies, the California DWR's June 19, 2017 filing includes a draft report addressing cultural resources that could be affected by their proposed reroute of the Oroville–Table Mountain transmission line. Consulting archaeologists with the firm Stantec and tribal monitors from Enterprise Rancheria conducted a new survey between May 1 and 3, 2017, of approximately 24 acres of the proposed transmission line reroute corridor that had not been previously surveyed during the relicensing surveys or during surveys for the recently proposed transmission line reroute by PG&E.

The survey recorded three new resources and one isolate; it also revisited 14 previously recorded resources and documented their pre-construction condition. The 14 previously recorded historic-era cultural resources have not been individually evaluated for listing on the National Register of Historic Places (National Register), but were previously recommended as contributing elements to a proposed Forks of the Feather River Historic District. To maintain consistency with California DWR's treatment of all resources within the corridor as eligible for the National Register for the purposes of section 106 compliance, the three newly recorded resources will be considered to be contributing elements to the proposed historic district. All of these resources are associated with gold mining, water management, transportation, and settlement activities occurring between the late nineteenth and early to middle twentieth century.

6.6.2 Environmental Effects

The Area of Potential Effect (APE) is generally, the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of sites eligible for listing in the National Register. The APE for the overall emergency recovery

¹⁴ The Final Environmental Impact Statement refers to the project as the Oroville Facilities.

and repair work at the Feather River Project is larger than, and encompasses the APE for California DWR's proposed transmission line reroute. The APE for California DWR's new segments of 230-kV transmission line will be within a new permanent right-of-way located outside of the spillway erosion influence zone. Construction of the project will require vegetation clearing of an approximate 300-foot wide corridor under the majority of the new transmission lines' 2-mile length, measured from the Hyatt Pumping-Generating Plant to a tie-in point with the existing Oroville-Table Mountain 230-kV Transmission Line beyond the damaged spillways. The APE includes approximately 130.41 acres in total. California DWR, in light of the emergency nature of the work, is assuming that all cultural resources located within the APE are eligible for listing in the National Register.

Based on review of existing documentation by California DWR, there are 14 historic-era cultural resources within the Project APE. Of those resources, 13 were identified within the APE prior to 2003. Additionally, PG&E recorded a linear cultural resource in 2017 within the APE, the Palermo Canal/ P-04-001945. A segment of this resource was previously recorded by California DWR in 2011 during relicensing.

According to California DWR's 2011 report, the 13 cultural resources within the APE have not been individually evaluated for the National Register, but have been evaluated and recommended as contributing elements to the proposed Forks of the Feather River Historic District. The historic district appears to be eligible for listing on the National Register under all four Criteria for Evaluation (36 CFR § 60.4). The three prevailing themes of the historic district are gold mining, settlement, and other extractive industries related to lime, chromite, pine resin, and timber resources. Periods of significance overlap and span 127 years, 1830-1957. The cultural resources within the transmission line reroute corridor fall under the gold mining and settlement themes of the historic district; however, the integrity of individual resources varies.

For the proposed transmission line reroute, California DWR would conduct ground-disturbing activities at each of the transmission line tower sites, including vegetation removal, excavation, and filling and grading. These ground-disturbing activities would occur within the boundaries of five archeological sites that are contributing resources to the proposed Forks of the Feather River Historic District. These sites are CA-BUT-2152H (historic dirt road); CA-BUT-2226H (historic dirt road); CA-BUT-2380H (historic ditch); CA-BUT-1105H (historic placer mining and occupation complex); and ORO-3 (historic mining site with prospecting pits). California DWR made a finding of no adverse effect for the transmission line reroute, consistent with 36 CFR 800.5(b) and 800.13(a)(2), because the undertaking would not alter the characteristics of the resources that qualify them as contributors to the historic district.

To ensure that there are no potential adverse effects to the five historic sites, California DWR proposes several measures during construction. These include

implementing a monitoring and discovery plan; preparing detailed re-recording of site forms, including photographs, archival data, and feature drawings; conducting a post-construction condition assessment of the sites; and, pursuant to 36 CFR § 800.13(a), implementing a data recovery plan in the event that information-bearing deposits are identified by archaeological or tribal monitors. In a letter to the California DWR dated June 16, 2017, the California SHPO stated that given these measures, they did not object to California DWR's finding of no adverse effect for the transmission line reroute. The California SHPO also stated that should California DWR need to activate the data recovery plan, California DWR and the Commission should follow the notification timelines at 36 CFR § 800.13(b).

We note that design constraints for the PG&E transmission line re-routing forced placement of transmission towers within the boundaries of two of the above sites, CA-BUT-1105H and CA-BUT 2380H. However, field testing in the presence of a tribal monitor determined that there would be no adverse effect to the resource by the tower work. A report summarizing the field testing was submitted to the California SHPO on June 1, 2017. In a letter dated June 5, 2017, the California SHPO concurred with the no adverse effect determination as long as archaeological and tribal monitors were present during construction of the tower. A discussion of potential cumulative impacts to cultural resources from the transmission line re-routes can be found in section 6.8 below.

On July 5, 2017, the Commission, California SHPO, and FEMA executed a PA for the management and treatment of cultural resources related to the response to the February spillway failure. The PA also includes provisions for the identification and management of potential effects to historic properties arising from transmission line relocations, including any future unanticipated discoveries. In addition, California DWR would continue to ensure that all construction and ground clearing is monitored by archaeological and tribal monitors. Last, there would be no mechanical clearing or grubbing within 50 feet of recorded historic resources, only hand tools such as chainsaws, brush cutters, and mobile chipping/mulching equipment would be used. Therefore, with the executed PA, implementation of the monitoring and discovery plan during construction, and hand clearing in sensitive areas, we do not anticipate any significant effects to cultural resources for California DWR's proposed transmission line reroute.

6.7 Recreation Resources and Aesthetics

Recreational activities in the vicinity of Lake Oroville include high- and low-speed boating, non-motorized boating, fishing, swimming, bicycling, equestrian use, hiking, and developed and primitive camping. License-required recreation facilities at the Feather River Project include: Lake Oroville Visitors Center; Bidwell Canyon Boat Ramp and Day Use Area; Lime Saddle Boat Ramp and Day Use Area, Loafer Creek Boat Ramp and Day Use Area; Oroville Dam Day Use Area; Spillway Boat Ramp and Day Use Area, Enterprise Boat Ramp; Thermalito Afterbay Boat Launch and Day Use Areas;

car-top boat launch ramps (at Dark Canyon, Foreman Creek, Nelson Bar, Stringtown, and Vinton Gulch); North Thermalito Forebay Recreation Area; South Thermalito Forebay Recreation Area; Diversion Pool Day Use Area; equestrian, bicycle, and hiking trails (Brad Freeman Trail, Dan Beebe Trail, and Saddle Dam Trailhead); campgrounds (Bidwell Canyon, Lime Saddle, Loafer Creek, North Thermalito Forebay RV, and the Oroville Wildlife Area Afterbay outlet camping area); floating and boat-in campsites, and other miscellaneous day use areas.¹⁵

6.7.1 Affected Environment

The proposed transmission line relocation corridor is located within the Lake Oroville State Recreation Area, which includes the recreational facilities at Lake Oroville, the Thermalito Diversion Pool, the Thermalito forebay, and the associated land and waters. The Thermalito Diversion Pool and shoreline are used for day-use activities such as swimming, fishing, non-motorized boating, trail use, and picnicking.

The proposed transmission line reroute corridor will cross portions of the Brad Freeman and Dan Beebe trails in locations on the south side of the diversion pool. The Brad Freeman Trail is a multi-use trail providing recreation for hikers, bikers, and equestrian trail riders. The Brad Freeman Trail circles the off-river Thermalito forebay, and Thermalito afterbay, follows the northern shore of the Thermalito Diversion Pool, crosses the crest of the Oroville Dam, and turns back to follow the southern shore of the diversion pool. The full trail is roughly 41 miles long and is predominantly dirt or gravel, with only a small paved section. The original transmission line route crossed the Brad Freeman Trail on the north side of the Thermalito Diversion Pool in at least one location within the general area of the proposed transmission line reroute. The Dan Beebe Trail is a 14.6-mile-long multi-use trail for equestrians and hikers. The previous transmission line route did not cross the Dan Beebe Trail. The Dan Beebe Trail parallels the southern shore of the Thermalito Diversion Pool a short distance upland from the Brad Freeman Trail.

¹⁵ See Table 43 and Figure 18 in the FEIS at pages 207-213.

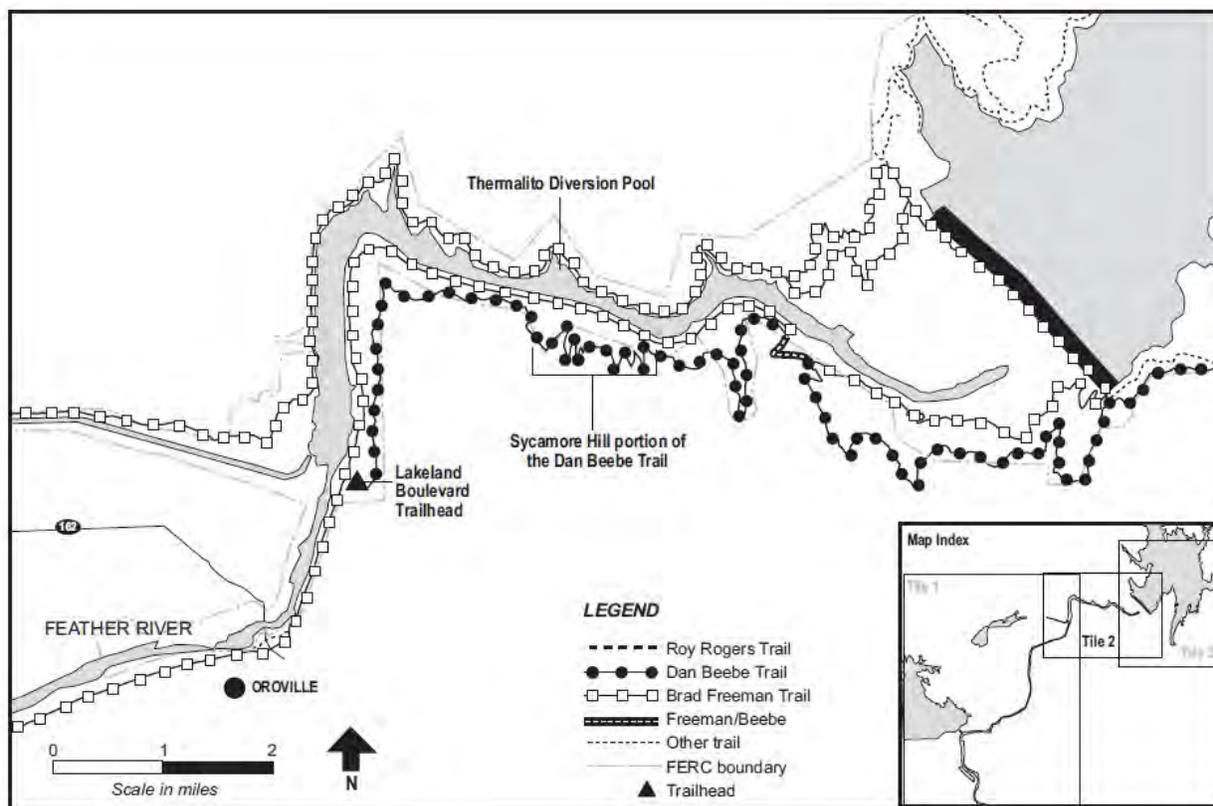


Figure 3. Map of the existing trails within the proposed transmission line reroute corridor (source: California DWR)

6.7.2 Environmental Effects

Following the February 2017 damage to the spillways at Oroville Dam and related downstream impacts, the Thermalito Diversion Pool and trails in the proposed work area were closed (see Figure 4 below), including portions of the Brad Freeman and Dan Beebe Trails. The trail closures were implemented to protect public safety, due to active construction equipment in the area. The trail closures are reported to the public through various avenues including the California DWR's Oroville Spillway Incident webpage as well as on the California Department of Parks and Recreation's Lake Oroville State Recreation Area webpage.¹⁶

¹⁶ See <http://www.water.ca.gov/oroville-spillway/> and https://www.parks.ca.gov/?page_id=462 (last visited July 31, 2017).

The proposed transmission line reroute will cross the Brad Freeman Trail at six new locations, will cross the Dan Beebe Trail at four new locations, and will cross the section where both trails merge into the same footprint at two new locations. Each of these crossings are a singular bisection, and the proposed reroute does not run parallel to the trail for any extended length. All trail crossings are located on the south side of the Thermalito Diversion Pool. Both trails are expected to be reopened once all construction efforts associated with the spillway repairs are completed in fall 2018.

The proposed construction work—i.e., clearing and grubbing of the transmission line reroute corridor; construction of laydown, staging areas, and access roads; and the placement of transmission line towers and lines—will not have a direct physical impact on the trails. Once the trails are re-opened to the public after California DWR completes its spillway repairs, the trail routes will return to their previous condition, with minimal effects to the aesthetic environment. Potential temporary effects include the loss of vegetation along the trail cleared for construction as well as temporary displacement of the existing wildlife and avian species in the area.

As discussed in section 6.4.2 above, if California DWR creates and implements a Revegetation Plan, this would allow California DWR to review the effects of the proposed work and restore the recreation areas to pre-construction conditions, where applicable.

California DWR has taken additional steps to offset the impacts of the proposed transmission line reroute to recreation sites and trails by implementing recreation improvements proposed as part of Settlement Agreement negotiations for the relicensing proceeding.¹⁷ On July 12, 2017, Commission staff issued an Order Amending Recreation Plan¹⁸ that authorized improvements to recreation facilities on Lake Oroville to offset the temporary closure of other recreation facilities near the damaged spillways and Oroville Dam. The July 12 order authorized: (1) expanding the Lime Saddle boat ramp parking lot; (2) expanding the Bidwell Canyon boat ramp parking lot and adding a lane to the existing boat ramp; (3) extending the Enterprise boat ramp and providing picnic sites; and (4) providing approximately two acres of gravel parking at the Saddle Dam Trailhead (not previously planned in the proposed 2006 Recreation Management Plan or Settlement Agreement) and new picnic sites. The completion of these facilities will result in a net increase in parking, boat-launching capacity, and other trailhead facilities at Lake Oroville. In addition, on August 3, 2017, California DWR filed an application with the Commission to construct additional parking areas at the Bidwell Canyon and Loafer Creek Recreation areas to further offset the loss of project recreation facilities. That application is currently under Commission review.

6.8 Cumulative Impacts

The Council on Environmental Quality's regulations for implementing the National Environmental Policy Act indicate that an action may cause cumulative impacts on the environment if its effects overlap in space or time with the effects of other past, present, or reasonably foreseeable future actions, regardless of the agency, company, or person undertaking the action.¹⁹ Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

We conclude that the proposed action is not likely to have a cumulative adverse effect on water quality or aquatic resources because construction in the proposed transmission line reroute corridor will occur a significant distance away from the Thermalito Diversion Pool with no expected impact to any navigable water. Similarly, we do not anticipate that the proposed action would have any cumulative adverse effects on threatened and endangered species, due to the absence of listed species and critical habitat in the vicinity of the construction area. Regarding terrestrial resources, we conclude above that the proposed action would have temporary and permanent effects to vegetation and wildlife. However, sufficient habitat exists in the areas immediately

¹⁷ See the Settlement Agreement filed on March 24, 2006, under Project No. 2100-052.

¹⁸ *Cal. Dep't of Water Res.*, 160 FERC ¶ 62,021.

¹⁹ 40 C.F.R. § 1508.7 (2017).

surrounding the project construction area such that the majority of wildlife and avian species are expected to temporarily disperse to less disruptive locations. Also, the proposed action's direct and indirect effects will be reduced through required mitigation. Therefore, the proposed action would not result in a cumulative adverse effect to terrestrial resources. For cultural resources, the licensee's ongoing consultation with the California SHPO, the presence of tribal monitors during construction, employment of the PA, and carrying out the agreed upon mitigation and data recovery measures at potentially affected archeological sites would negate any cumulative impacts to cultural resources. Finally, the proposed transmission line corridor will cause a temporary, minimal aesthetic impact to crossed recreational trails. This minimal impact, coupled with the licensee's effort to mitigate recreation impacts by improving and expanding recreation facilities in other locations on Lake Oroville, leads us to the conclusion that the proposed action would not have any significant or lasting cumulative impact to recreation resources.

Taken together, the proposed transmission line reroute will not have a significant cumulative impact on environmental resources.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

We conclude that the no-action alternative—leaving the temporary transmission line in place indefinitely across the uphill portions of the damaged spillways—is not feasible. The no-action alternative would inhibit the spillway recovery efforts both directly, leaving an obstacle to construction, and indirectly, undermining the reliable transmission of electricity from the Hyatt Pumping-Generating Plant so that the plant can continuously pass flows out of Lake Oroville. California DWR and Commission staff have not identified any reasonable alternative to California DWR's proposed reroute of its primary transmission lines that were affected by the damage and substantial erosion at the Feather River Project's main and emergency spillways. The proposed action would result in minor adverse effects to terrestrial, cultural, and recreation resources. However, these effects would be mitigated by the licensee's proposed protective measures, the recommended protective measures are described below, and by the process and measures prescribed in the programmatic agreement with the California SHPO for protection of cultural resources.

7.2 Staff-Recommended Measures

(1) To mitigate for the loss of vegetation, the habitat it provides, and to reduce the spread and introduction of nonnative, invasive species, staff recommends that the California DWR and its contractors use best management practices when clearing and

grubbing any vegetation to reduce the impact to the existing wildlife and recreation areas and minimize the introduction of invasive and noxious species. To mitigate for the loss of vegetation, wildlife habitat, and the aesthetic scenery around the recreation trails, post construction, staff recommends that California DWR develop a Revegetation Plan in consultation with the FWS and California Department of Fish and Wildlife to revegetate applicable areas and return them to their pre-construction conditions. The plan should (a) identify areas disturbed during construction and classify whether these areas could be safely revegetated to simulate pre-construction conditions or would need to be maintained to ensure transmission line safety, with emphasis on areas that would be visible to the public when using project recreational facilities; (b) identify the native species to be planted in the revegetation areas and the methods used, including the type and schedule for assisting the plantings through watering, mulching, or other methods; (c) provide for post-planting monitoring and evaluation of the success of the plantings and presence of undesirable noxious and invasive weeds; (d) provide for the removal of invasive and noxious weeds, if discovered, and enact follow-up plantings of native vegetation in those areas; and (e) establish an implementation schedule for these actions.

(2) In order to provide further protection of avian species from temporary impacts during construction and from potential collisions and mortality resulting from the erected permanent transmission lines, staff recommends that California DWR review and incorporate additional protection measures into both the design of the transmission lines and towers and their construction, such as those found in the guidelines produced by the FWS and the Avian Power Line Interaction Committee.

(3) To keep the Commission apprised of the status of the tree on which the bald eagle nest is located, staff recommends that California DWR file the Bald Eagle Take Permit authorized by the FWS and any relevant consultation.

7.3 Finding of no significant impact

Based on information, analysis, and evaluations contained in this EA, we find that approval of the proposed transmission line reroute would not constitute a major federal action significantly affecting the quality of the human environment.

8.0 LITERATURE CITED

Avian Power Line Interaction Committee (APLIC) (2006). Suggested practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Avian Power Line Interaction Committee (APLIC) (2012). Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.

California Department of Water Resources (2005). Application for project license, filed January 26, 2005.

Federal Energy Regulatory Commission (2007). Final Environmental Impact Statement (FEIS) for the Oroville Facilities Project, issued May 18, 2007.

9.0 LIST OF PREPARERS

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Document Content(s)

P-2100-180-EA.DOCX.....1-35

Attachment 6

Names of the Tribes provided by the NAHC

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Native American Contact List
Butte County
5/1/2020**

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This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Proposed Easement for relocated Oroville-Table Mountain 230 kV facilities, Butte County.

**PG&E Gas and Electric
Advice Submittal List
General Order 96-B, Section IV**

AT&T	Downey & Brand	Pioneer Community Energy
Albion Power Company	East Bay Community Energy	Redwood Coast Energy Authority
Alcantar & Kahl LLP	Ellison Schneider & Harris LLP	Regulatory & Cogeneration Service, Inc.
Alta Power Group, LLC	Energy Management Service	SCD Energy Solutions
Anderson & Poole	Engineers and Scientists of California	
Atlas ReFuel	GenOn Energy, Inc.	SCE
BART	Goodin, MacBride, Squeri, Schlotz & Ritchie	SDG&E and SoCalGas
Barkovich & Yap, Inc.	Green Power Institute	SPURR
California Cotton Ginners & Growers Assn	Hanna & Morton	San Francisco Water Power and Sewer
California Energy Commission	ICF	Seattle City Light
California Public Utilities Commission	IGS Energy	Sempra Utilities
California State Association of Counties	International Power Technology	Southern California Edison Company
Calpine	Intestate Gas Services, Inc.	Southern California Gas Company
Cameron-Daniel, P.C.	Kelly Group	Spark Energy
Casner, Steve	Ken Bohn Consulting	Sun Light & Power
Cenergy Power	Keyes & Fox LLP	Sunshine Design
Center for Biological Diversity	Leviton Manufacturing Co., Inc.	Tecogen, Inc.
Chevron Pipeline and Power	Los Angeles County Integrated	TerraVerde Renewable Partners
City of Palo Alto	Waste Management Task Force	Tiger Natural Gas, Inc.
City of San Jose	MRW & Associates	TransCanada
Clean Power Research	Manatt Phelps Phillips	Troutman Sanders LLP
Coast Economic Consulting	Marin Energy Authority	Utility Cost Management
Commercial Energy	McKenzie & Associates	Utility Power Solutions
Crossborder Energy	Modesto Irrigation District	Water and Energy Consulting Wellhead
Crown Road Energy, LLC	NLine Energy, Inc.	Electric Company
Davis Wright Tremaine LLP	NRG Solar	Western Manufactured Housing
Day Carter Murphy	Office of Ratepayer Advocates	Communities Association (WMA)
Dept of General Services	OnGrid Solar	Yep Energy
Don Pickett & Associates, Inc.	Pacific Gas and Electric Company	
Douglass & Liddell	Peninsula Clean Energy	