APPLICATION FOR NEW LICENSE
MAJOR PROJECT – EXISTING DAM

VOLUME I: INITIAL STATEMENT AND EXHIBITS A, B, C, D, F, G and H

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INITIAL STATEMENT
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CAMP FAR WEST HYDROELECTRIC PROJECT
FERC Project No. 2997

SECURITY LEVEL: PUBLIC

Prepared by:
South Sutter Water District
2464 Pacific Ave.
Trowbridge, CA 95659

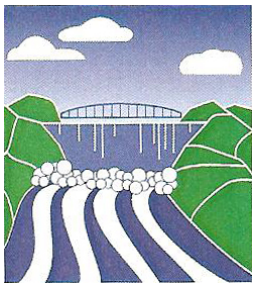
June 2019

Application for a New License
Major Project – Existing Dam

Initial Statement

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997



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June 2019

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INITIAL STATEMENT

Before The Federal Energy Regulatory Commission

Application for a New License for a Major Project – Existing Dam

1.0 Introduction

The South Sutter Water District (SSWD, Licensee or Applicant) has prepared this Initial Statement, as part of its Application for a New License Major Project from the Federal Energy Regulatory Commission (FERC or Commission) for the Camp Far West Hydroelectric Project (Project), FERC Project Number 2997. The Project's existing FERC Boundary includes no federal land nor is any federal land adjacent to the boundary or on the Bear River downstream of the Project.

This Initial Statement is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Traditional Licensing Process [TLP]). In particular, this Initial Statement conforms to the regulations in 18 C.F.R. Sections (§§) 4.51(a) and 4.32(a), which pertains to the contents of an Initial Statement.

2.0 Applicant and Requested Term of New License

SSWD formally applies to the Commission for a new license for the Project, a water power project, as described in the attached exhibits. The initial license for the Project was issued by FERC to SSWD on July 2, 1981, effective on July 1, 1981 for a period of 40 years.

On March 14, 2016, SSWD filed with FERC a Notice of Intent to File an Application for a New License for the Project on or before June 30, 2019, 2 years prior to the expiration of the existing FERC license.

SSWD proposes to continue operating the Project for the next 40 years with one modification to the spillway, a reservoir pool raise of 5 feet (from 300.0 feet NMWSE to 305.0 feet NMWSE), and the adoption of the resource management measures proposed in its license application.

SSWD requests a new license term of 50 years. FERC's Policy Statement on Establishing License Terms for Hydroelectric Projects, 161 FERC ¶ 61,078 (2017) includes as a justification for granting a longer license term where significant measures are expected to be implemented under the new license for non-development purposes (i.e., environmental, recreation and water supply) or those that enhance power and developmental purposes. FERC's long-standing practice is to consider costs of improvements relative to the size of the project. Further,

America's Water Infrastructure Act of 2018, Pub. L. No. 115-270, 132 Stat. 3765, requires FERC to give equal weight to investments by the licensee over the term of the existing license that resulted in redevelopment, new construction, new capacity, efficiency, modernization, rehabilitation or replacement of major equipment, safety improvements, or environmental, recreation, or other measures conducted over the term of the existing license.

Based on these FERC and Congressional directives, SSWD's request for a 50-year license term is warranted. SSWD is in the process of constructing a new auxiliary spillway structure and related modifications which constitute a major investment in the Project. SSWD expects to spend approximately $8,812,206 on the spillway modifications (i.e., Secondary Spillway) and related Project modifications. Further, SSWD is proposing a 5 foot pool raise that will enhance the water supply benefits of the Project. SSWD's estimated cost for the pool raise is $3,942,264. SSWD also is proposing to relocate recreational facilities impacted by the pool raise, at an additional estimated cost of $725,000. These Project investments would total approximately $13,479,470, a very substantial amount for a 6.8 MW project, and are in addition to the costs of the PM&E measures proposed in the FLA.

3.0 Location of the Project

The location of the Project is:

State:	California
Township or nearby town:	City of Wheatland, CA
Counties:	Yuba, Nevada, and Placer
Stream or other body of water:	Bear River

4.0 Applicant's Name, Business Address and Telephone Number

SSWD's physical address, mailing address and telephone number are:

South Sutter Water District
2464 Pacific Avenue
Trowbridge, CA 95659
Tel: (530) 656-2242

5.0 Applicant's Authorized Agent

The exact name, business address and telephone number of the person authorized to act for SSWD as an agent for this Application for a New License are:

Brad Arnold
General Manager
South Sutter Water District
2464 Pacific Avenue
Trowbridge, CA 95659
Tel: (530) 656-2242
sswd@hughes.net

6.0 Applicant's Organizational Status

Established in 1954, SSWD, located in Trowbridge, California, is a State of California public agency formed under California Water District Law, California Water Code Section 34000 et seq. to develop, store, and distribute surface water supplies for irrigation uses in SSWD's service area. In addition, Section 34000 et seq. authorizes SSWD to develop hydroelectric power in connection with SSWD's projects. SSWD is governed by a Board of Directors, whose seven members are elected by landowners within SSWD's service area.

SSWD's service area encompasses a total gross area of 63,972 acres (ac), of which 6,960 ac are excluded, for a net area of 57,012 ac. Approximately 40,107 ac are in Sutter County and 16,905 ac are in Placer County. In a normal year, over 35,500 ac within SSWD's service area are under irrigation, with approximately 29,110 ac (82%) in rice production, 3,905 ac (11%) in orchards, 2,130 ac (6%) in irrigated pastures, and 355 ac (1%) in miscellaneous row and field crops.

7.0 Pertinent Statutory and Regulatory Requirements of the State of California

The statutory or regulatory requirements of California, the State in which the Project is located, that may affect the Project with respect to: 1) bed and banks; 2) appropriation, diversion, and use of water for power purposes; 3) right to engage in the business of developing, transmitting, and distributing power; and 4) any other business necessary to accomplish the purposes of the license under the Federal Power Act, are:

- California Water Code Sections 1200-1831 – Specify requirements and procedures for appropriation and use of water for power purposes.
- California Water Code Section 13160; Title 23, California Code of Regulations Sections 3855-3861 – California Water Code Section 13160 designates California State Water Resources Control Board (SWRCB) as the state water pollution control agency for Federal Water Pollution Control Act and any other federal act. Title 23, California Code of Regulations, Sections 3855-3861 specify requirements and procedures for applications for water quality certificates required under federal law.

- California Water Code Sections 6075-6157 – Specify powers of the California Division of Safety of Dams (DSOD) and specify requirements and procedures for the inspection and maintenance of dams.

The steps which SSWD has taken or plans to take to comply with each of the laws cited above are described below:

- SSWD already has the water rights necessary to operate the Project.
- SSWD will file an application for a water quality certificate with the SWRCB within 60 days after the date that FERC issues a notice that SSWD's Application for New License is ready for environmental analysis [18 C.F.R. § 4.34(b)(5)].
- SSWD cooperates, and will continue to cooperate, with DSOD on annual inspections of Project dams.

In addition, CDFW in its written comments on SSWD's December 2018 Draft Application for new license, requested SSWD include in its Initial Statement of the Application for New License the following sections from the California Fish and Game Code (F.G.C.): Sections 1600 to 1616 that require parties notify CDFW and follow the prescribed requirements before substantially changing or using any material from any lake or streambed; Section 2302 regarding the responsibility of reservoir managers and owners related to dreissenid mussel; Section 5937 regarding sufficient water for fish existing below dams; and Section 5943 regarding public access of dam waters. As a project licensed by FERC under the Federal Power Act, the Project is not subject to state fish and wildlife laws and regulations. However, for completeness and in respect for CDFW's request, SSWD notes these F.G.C sections here.

8.0 Proprietary Rights Necessary to Construct, Operate and Maintain the Project

SSWD owns all existing Project facilities and has the necessary proprietary rights, title and interest in lands and water to operate and maintain the Project. No Project facilities are federally-owned or operated. SSWD has the necessary proprietary rights, title and interest in lands and water to implement the Pool Raise.

9.0 Counties, Cities, Other Political Subdivisions and Indian Tribes Affected by the Project

The name and mailing address of the counties in which the Project is located are:

County of Nevada
Board of Supervisors
950 Maidu Avenue
Nevada City, CA 95959-8600

County of Placer
Board of Supervisors
175 Fulweiler Avenue
Auburn, CA 95603-4543

County of Yuba
Board of Supervisors
215 Fifth Street
Marysville, CA 95901-5737

The Project is not located within any designated cities, towns or subdivisions, nor is a Project dam located within 15 miles of any city of town with a population of 5,000 or more.

The Project does not use any federal facilities or any State of California facilities. No other irrigation districts own or operate facilities within the Project.

The Project is located within the vicinities of the following irrigation district areas, planning/zoning areas, and similar special purpose political subdivision areas:

Nevada County Local Agency Formation Commission
Executive Officer
950 Maidu Avenue
Nevada City, CA 95959

Nevada County Resource Conservation District
Manager & Bear River Watershed Coordinator
113 Presley Way, Suite 1
Grass Valley, CA 95945-5846

Nevada Irrigation District
1036 West Main Street
Grass Valley, CA 95945-5424

Placer County Local Agency Formation Commission
Commission Clerk
110 Maple Street
Auburn, CA 95603

Placer County Resource Conservation District
Director
251 Auburn Ravine, Suite 107
Auburn, CA 95603-3719

Sierra Nevada Conservancy
Executive Director
11521 Blocker Drive, Suite 205
Auburn, CA 95603

Yuba County Local Agency Formation Commission
Commission Clerk
825 Ninth Street, Suite B
Marysville, CA 95901

Yuba County Resource Center
Conservation District Director
1511 Butte House Road, Suite B
Yuba City, CA 95993

No parties divert water directly from the Project Facilities or features for irrigation or domestic water uses other than SSWD, which pumps a small amount of water from Camp Far West Reservoir to service the Project recreation areas.

The Project is not located within any federal special purpose political subdivision.

In addition to the parties noted above, SSWD has reason to believe that the following political subdivision in the general area of the Project would likely be interested in or affected by this relicensing:

City of Wheatland
City Manager
111 C Street
Wheatland, CA 95692

County of Sutter
Board of Supervisors
1160 Civic Center Blvd
Yuba City, CA 95993

The Project is not located within or adjacent to an Indian tribe reservation.

Native American individuals and organizations that may be affected by the Project are listed below. By including this list here, SSWD does not imply that any tribe listed below will be interested in the Camp Far West Hydroelectric Project relicensing, or that tribes not included in this list would not be interested in the relicensing.

Colfax-Todds Valley Consolidated Tribe
Pamela Cubbler, Chairperson
P.O. Box 734
Auburn, CA 95604

Strawberry Valley Rancheria
Cathy Bishop, Chairperson
PO Box 984
Marysville, CA 95901

Colfax-Todds Valley Consolidated Tribe
Judy Marks, Secretary
1068 Silverton Circle
Lincoln, CA 95648

Colfax-Todds Valley Miwok-Maidu Cultural Foundation
Michelle Roper, Chairperson
P.O. Box 1490
Foresthill, CA 95631

Greenville Ranch Tribe of the Maidu Indians
Patty Allen
PO Box 279 140 Main St.
Greenville, CA 95947

Greenville Ranch Tribe of the Maidu Indians
Kyle Self
PO Box 279 140 Main St.
Greenville, CA 95947

T'Si-akim Maidu
Jason Ryberg,
P.O. Box 634
Rough Ready, CA 95975

United Auburn Indian Community
Matthew Moore, THPO
10720 Indian Hill Road
Auburn, CA 95603

T'Si-akim Maidu
Eileen Moon, Vice Chairperson
P.O. Box 1246
Grass Valley, CA 95945

United Auburn Indian Community
Marcos Guerrero, Cultural Resources Supervisor
10720 Indian Hill Road
Auburn, CA 95603

T'Si-akim Maidu
Grayson Coney, Cultural Director
P.O. Box 1316
Grass Valley, CA 95945

United Auburn Indian Community
Gene Whitehouse, Chairperson
10720 Indian Hill Road
Auburn, CA 95603

Nevada City Rancheria
Shelly Covert, Secretary
641 S Auburn St.
Grass Valley, CA 95945

Nevada City Rancheria
Richard Johnson, Chairperson
PO Box 574
Grass Valley, CA 95945

In addition, based on other recent activities associated with the Project, SSWD has reason to believe that the following Native American individuals and organizations may have knowledge of cultural resources in the Project area:

Mooretown Rancheria of Maidu Indians
Benjamin Clark
#1 Alverda Drive
Oroville, CA 95966

SSWD will include the parties above on the Camp Far West Hydroelectric Project relicensing Contact List, and will make a copy of the Application for New License, including Exhibit G maps, available to each party listed above, or their designee, when SSWD files the Application for New License with FERC.

10.0 Federal, State and Local Agencies That May Be Interested in the Project

SSWD believes the following federal, State of California, and local agencies might be interested in the Camp Far West Hydroelectric Project relicensing. By including this list here, SSWD does not imply that these agencies will be interested in the Camp Far West Hydroelectric Project relicensing or that agencies not included in this list would not be interested in the relicensing.

Federal Agencies

Advisory Council on Historic Preservation
Federal Agency Director
401 F Street NW, Ste. 308
Washington, DC 20001

U.S. Department of the Interior, Fish and Wildlife Service
Habitat Restoration Coordinator
Anadromous Fish Restoration Program
1707 Nimbus Road, Ste. A
Rancho Cordova, CA 95670

Federal Emergency Management Agency
External Affairs Director
Regional Office
1111 Broadway, Ste. 1200
Oakland, CA 94607

U.S. Department of the Interior,
Fish and Wildlife Service
Branch Chief
Energy and Power
2800 Cottage Way, Suite W-2605
Sacramento, CA 95825-1846

U.S. Department of Commerce,
National Oceanic and Atmospheric Administration,
National Marine Fisheries Service
FERC Coordinator
Southwest Region
777 Sonoma Avenue, Room 325
Santa Rosa, CA 95404-6515

United States Department of the Interior,
National Park Service
Outdoor Recreation Planner
333 Bush Street, Suite 500
San Francisco, CA 94101-2828

U.S. Department of Commerce,
National Oceanic and Atmospheric Administration,
National Marine Fisheries Service
Assistant Regional Administrator
2800 Cottage Way
Sacramento, CA 95825-1846

U.S. Environmental Protection Agency
Regional Director
Pacific Southwest Regional Office
75 Hawthorne Street
San Francisco, CA 94105-3922

Federal Energy Regulatory Commission
Office of Energy Projects Diversion of Dam Safety and Inspections
Frank Blackett, Regional Engineer
San Francisco, Regional Office
100 First Street, Suite 2300
San Francisco CA 94105

Department of the Interior
Bureau of Land Management (BLM)
Branch of Adjudication and Records (CA-943.5)
2800 Cottage Way, Suite W1834
Sacramento CA 95825-1886

Federal Energy Regulatory Commission
Regional Director
901 Market Street, Suite 350
San Francisco, CA 94103

Federal Energy Regulatory Commission
Office of General Counsel-Energy Projects
888 First Street, N.E.
Room 101-56
Washington, DC 20426

State of California Agencies

California Department of Boating and Waterways
Director
One Capitol Mall, Ste. 500
Sacramento, CA 95814

California Department of Fish and Wildlife
Manager – Region 2
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4503

California Department of Forestry and Fire Protection
Region 2 – Cascade
Nevada-Yuba-Placer Unit
13760 Lincoln Way
Auburn, CA 95603-3236

California Department of Parks and Recreation
Office of Historic Preservation
State Historic Preservation Office
P. O. Box 942896
Sacramento, CA 94296-0001

California Department of Transportation
Director – District 10
1976 East Charter Way
Stockton, CA 95205

California Department of Water Resources
1416 Ninth Street, 11th Floor
P.O. Box 942836
Sacramento, CA 95814-5511

Regional Water Quality Control Board
Central Valley Region
Executive Officer
11020 Sun Center Drive, #200
Sacramento, CA 95670-3888

State Water Resources Control Board
Section 401 Coordinator
1001 I Street
P. O. Box 2000
Sacramento, CA 95812-2048

SSWD will include the parties above on the Camp Far West Hydroelectric Project relicensing Contact List, and will make a copy of the Application for New License, including Exhibit G maps, available to each party listed above, or their designee, when SSWD files the Application for New License with FERC.

11.0 Businesses, Non-Governmental Organizations and Members of the Public That May Be Interested in the Project

For informational purposes, SSWD provides to the FERC the following list of businesses, non-governmental organizations (NGOs) and members of the public that have specifically asked SSWD to include them on the Camp Far West Hydroelectric Project Contact List, or that SSWD has reason to believe might be interested in the relicensing. By including this list here, SSWD does not imply that each party will be interested in the Camp Far West Relicensing Project relicensing, or that businesses, NGOs or members of the public not included in this list would not be interested in the relicensing.

American Rivers
California Regional Director
120 Union Street
Nevada City, CA 95959

American Whitewater
California Stewardship Director
4 Baroni Drive
Chico, CA 95928-4314

California Hydropower Reform Coalition
Director
370 Belmont Avenue #6
Oakland, CA 94610

California Sportfishing Protection Alliance
Director
1248 East Oak Avenue #D
Woodland, CA 95776

California Trout
Executive Director
360 Pine Street
4th Floor
San Francisco, CA 94104

Camp Far West Lake Concessionaire, North and South Shore
8176 Camp Far West Road
Wheatland, CA 95692

Federation of Fly Fishers, Northern California Council
P.O. Box 1017
Meadow Vista, CA 95722-1017

Environmental Advocates
5135 Anza Street
San Francisco, CA 94121

Foothills Water Network
Coordinator
P.O. Box 573
Coloma, CA 95613

Friends of the River
Senior Policy Advocate
Suite 100
Sacramento, CA 95811

Natural Heritage Institute
President
100 Pine Street, Suite 1550
San Francisco, CA 94111

Pacific Gas and Electric Company
Janet Walther
Mail Code N11C
P.O. Box 770000
San Francisco, CA 94177-0001

Sacramento Municipal Water District
Director, Power Generation
6201 S Street, MS A204
Sacramento, CA 95817

Sierra Club, Mother Lode Chapter
Chapter Executive Committee Chair
909 12th Street, Suite 202
Sacramento, CA 95814-2700

Sierra Nevada Alliance
Executive Director
P.O. Box 7989
South Lake Tahoe, CA 96158-7989

South Yuba River Citizens League
Executive Director
313 Railroad Avenue
Nevada City, CA 95959

Environmental Defense Fund
California Legislative Headquarters
1107 Ninth Street, Suite 1070
Sacramento, CA 95814

Trout Unlimited
CA Water Project/Director
2239 Fifth Avenue
Berkeley, CA 94710

SSWD will include the parties above on the Camp Far West Hydroelectric Project Relicensing Contact List, and will make a copy of the Application for New License, including Exhibit G, available to each party listed above, or their designee, when SSWD files the Application for New License with FERC.

12.0 Readily Accessible, Reviewable and Reproducible Information

This Application for New License, as well as other information required under 18 C.F.R. Section 4.32(b)(3), is available to businesses, NGOs and members of the public for inspection, review and reproduction (at a reasonable cost of reproduction and postage) during regular business hours (8:00 a.m. - 5:00 p.m., Monday through Friday) at SSWD's place of business; which is:

South Sutter Water District
2464 Pacific Avenue
Trowbridge, CA 95659

The public is instructed to contact Mr. Brad Arnold, or his designee, by telephone at (530) 656-2242 to make an appointment to review the information.

As required by 18 C.F.R. Section 4.32(b)(3), a copy of this Application for New License is available at the following public libraries in the Project region:

Nevada County Public Library
Grass Valley Library - Royce Branch
207 Mill Street
Grass Valley, CA 95945-6711

Yuba County Public Library
303 2nd Street
Marysville, CA 95901-6011

Placer County Public Library
350 Nevada Street
Auburn, CA 95603-3720

In addition, in conformance with 18 C.F.R. Section 4.32(b)(3) and to facilitate the distribution of documents and information regarding the Camp Far West Hydroelectric Project relicensing, SSWD maintains a Camp Far West Hydroelectric Project Relicensing Website at http://www.sswdrelicensing.com. Information and relicensing documents, except for excessively

large documents, including this Application for New License, are available in portable document format (.PDF) on the website.

13.0 Notice of Availability of Application

As required by 18 C.F.R. Section 4.32(b)(6), SSWD will publish a notice of the availability of this Application for New License twice within 14 days of the date it is filed with FERC in the following newspapers of general circulation:

NEVADA COUNTY:
The Union
464 Sutton Way
Grass Valley, CA 95945

PLACER COUNTY:
Lincoln News Messenger
188 Cirby Way
Roseville, CA 95678

YUBA COUNTY:
Appeal-Democrat
P.O. Box 431
Marysville, CA 95901

A copy of the publication is attached. SSWD will promptly file with FERC proof of publication.

14.0 Exhibits

The exhibits that are filed as part of this Application for New License are:

- Exhibit A – Project Description
- Exhibit B – Project Operations and Resource Utilization
- Exhibit C – Construction History and Proposed Construction Schedule
- Exhibit D – Statement of Costs and Financing
- Exhibit E – Environmental Report
- Exhibit F – General Design Drawings
- Exhibit G – Project Maps
- Exhibit H – Miscellaneous Material

The foregoing Initial Statement and attached exhibits are hereby made part of this Final Application for New License.

SUBSCRIPTION AND VERIFICATION

This application for new license is executed in the State of California, City of Trowbridge, and County of Sutter by Brad Arnold, General Manager of the South Sutter Water District being first duly sworn, deposes and states that the contents of this application for new license are true to the best of his knowledge or belief, and signs the application this 24th day of June 2019.

SOUTH SUTTER WATER DISTRICT

By: Brad Arnold
Brad Arnold, General Manager

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Sutter

Subscribed and sworn to (or affirmed) before me on this 24th day of June, 2019,
Date *Month* *Year*
by
(1) Brad Arnold
(~~and (2)~~ _____),
Name(s) of Signer(s)

proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

ROSEMARY B. WILHITE
Notary Public - California
Sutter County
Commission # 2278567
My Comm. Expires Mar 23, 2023

Signature Rosemary B. Wilhite
Signature of Notary Public

Seal
Place Notary Seal Above

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ATTACHMENT 1

Draft Public Notice to Be Placed by the SSWD in Local Periodicals Twice within 14 days of SSWD Filing the Final License Application for New License with FERC

**Announcement of Filing of Application
Before the Federal Energy Regulatory Commission
for a New License Major Project – Existing Dam
for the
Camp Far West Hydroelectric Project**

South Sutter Water District (SSWD) owns and operates the Federal Energy Regulatory Commission (FERC)-licensed Camp Far West Hydroelectric Project, a water power project in Yuba, Placer and Nevada counties, California, on the Bear River. The Project is composed of one development – Camp Far West. The current FERC license for the Project expires on June 30, 2021.

In June 2019, SSWD applied to FERC for a New License for a Major Project – Existing Dam. The Application describes the Project facilities, Project operation, estimated costs related to continued operations, and general information. The Application also includes a description of environmental and recreational resources in the vicinity of the Project; an assessment of potential adverse environmental impacts associated with continued Project operation and maintenance; and SSWD's proposed resource management measures to protect and enhance environmental and recreation resources, and mitigate any Project impacts.

As required by 18 C.F.R. Section 4.32(b)(3), at this time SSWD announces the availability for inspection and reproduction of the Application. The Application has been made available in electronic format to pertinent resource agencies and Native American Tribes, and a copy is available for inspection and reproduction during regular business hours at the Public Libraries in Marysville, Grass Valley, and Auburn as well as at SSWD's office at 2464 Pacific Avenue Trowbridge, CA 95659 (tel: 530-656-2242). The Application is also available on SSWD's Relicensing Website at http://www.sswdrelicensing.com. A copy of the Application may also be obtained upon request from SSWD after reasonable reimbursement to SSWD for postage and reproduction.

Upon acceptance of the Application for filing, FERC will publish notices soliciting additional public participation.

Questions regarding this notice should be addressed to Brad Arnold, General Manager, at (530) 656-2242.

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Application for New License
Major Project – Existing Dam

Exhibit A
Project Description

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997

Prepared by:
South Sutter Water District
2464 Pacific Avenue
Trowbridge, CA 95659
www.sswd@hughes.net

June 2019

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None.

EXHIBIT A

PROJECT DESCRIPTION

1.0 Introduction

The South Sutter Water District (SSWD or Licensee) has prepared this Exhibit A, Project Description, as part of its Application for a New License Major Project – Existing Dam – (FLA) from the Federal Energy Regulatory Commission (FERC or Commission) for the Camp Far West Hydroelectric Project, FERC Project Number (No.) 2997 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (traditional process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section 4.51(b), which describes the contents of Exhibit A, Project Description. This Exhibit A describes, in detail, all existing and SSWD proposed Project facilities and features. As a reference, 18 C.F.R. Section 4.51(b) states:

> Exhibit A is a description of the Project. This exhibit need not include information on project works maintained and operated by the U.S. Army Corps of Engineers, the Bureau of Reclamation, or any other department or agency of the United States, except for any project works that are proposed to be altered or modified. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The description for each development must contain:
>
> (1) The physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, to be included as part of the project;
>
> (2) The normal maximum surface area and normal maximum surface elevation (mean sea level), gross storage capacity, and usable storage capacity of any impoundments to be included as part of the project;
>
> (3) The number, type, and rated capacity of any turbines or generators, whether existing or proposed, to be included as part of the project;
>
> (4) The number, length, voltage, and interconnections of any primary transmission lines, whether existing or proposed, to be included as part of the project (see 16 U.S.C. 796(11));
>
> (5) The specifications of any additional mechanical, electrical, and transmission equipment appurtenant to the project; and
>
> (6) All lands of the United States that are enclosed within the project boundary described under paragraph (h) of this section (Exhibit G), identified and tabulated by legal subdivisions of a public land survey of the affected area or, in the absence of a public land survey, by the best available legal description. The tabulation must show the total acreage of the lands of the United States within the project boundary.

Besides introductory material, this exhibit includes five sections. The Project's location is described in Section 2.0. Section 3.0 provides details of the existing Project facilities and features, including dimensions, physical features, and other pertinent information. Section 4.0 describes the area within the existing FERC Project Boundary. Section 5.0 describes SSWD's

proposed changes to existing Project facilities and features. Section 6.0 provides a bibliography of the references listed in this exhibit.

See Exhibit B for a description of Project operations, Exhibit C for a construction schedule for any proposed new facilities, Exhibit D for costs and financing information, and Exhibit E for a discussion of potential environmental effects and SSWD's proposed resource management measures. Project design drawings and maps are included in Exhibits F and G, respectively. Exhibit H contains a detailed description of the need for the electricity provided by the Project, availability of electrical energy alternatives, and other miscellaneous information.

All elevation data in this exhibit is in United States Department of Commerce (USDOC), National Oceanic and Atmospheric Association (NOAA), National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

2.0 Project Location

The Camp Far West Hydroelectric Project, which ranges in elevation from 150 feet (ft) at the base of Camp Far West Dam to 320 ft at the upper elevation contour of the existing FERC Project Boundary, is located on the mainstem of the Bear River in northern California in Nevada, Yuba and Placer counties in the western foothills of the Sierra Nevada. The Bear River is a tributary to the Feather River and is part of the Sacramento River Basin, which drains into the San Francisco Bay. Figure 2.0-1 illustrates the general regional location of the Project. Figure 2.0-2 shows the Project Vicinity,[1] and the existing Project facilities and features and FERC Project Boundary.

[1] In this exhibit, "Project Vicinity" refers to the area surrounding the Project on the order of United States Geological Survey (USGS) 1:24,000 scale topographic quadrangle.

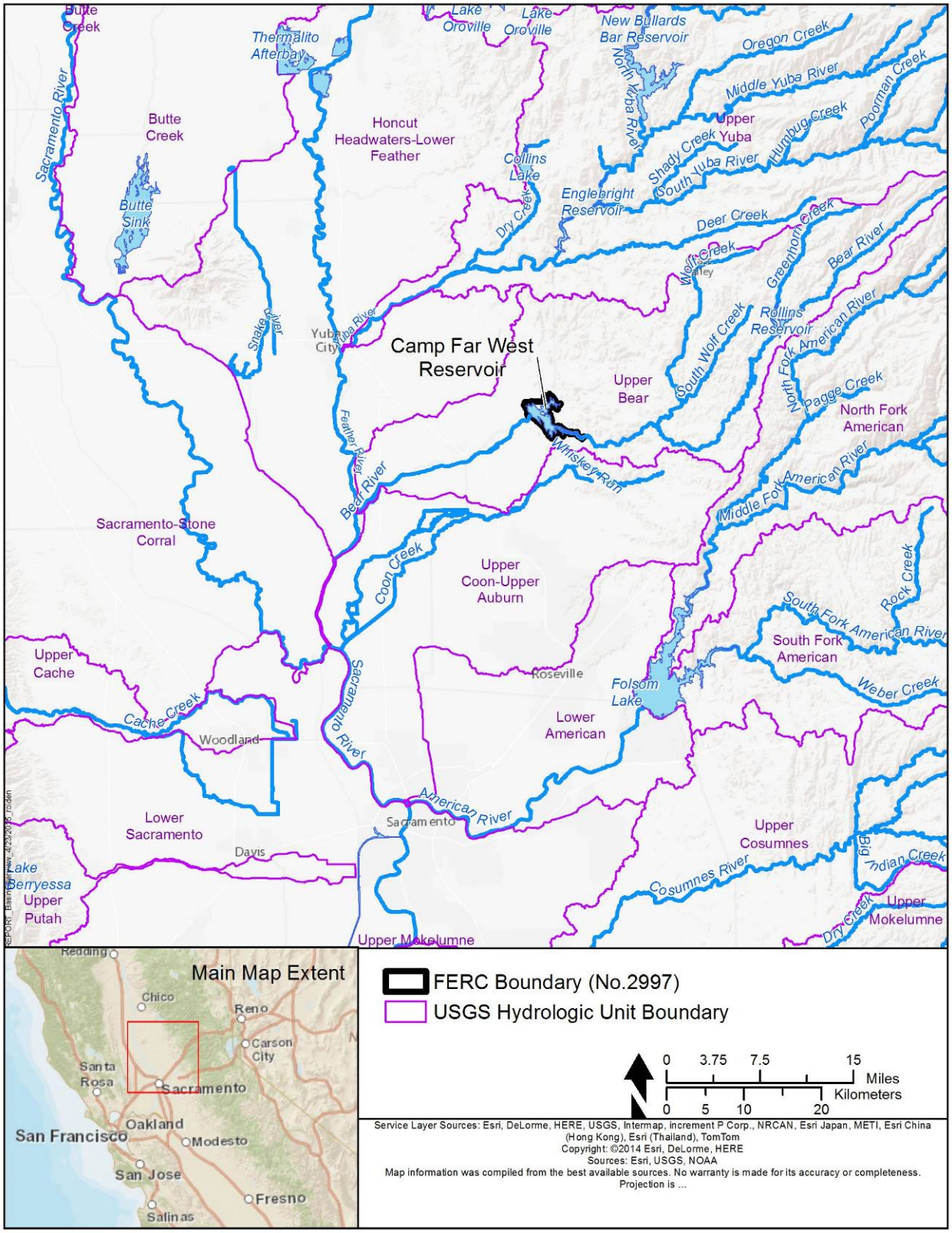


Figure 2.0-1. Bear River watershed in relation to the Feather River and other tributaries to the Sacramento River.

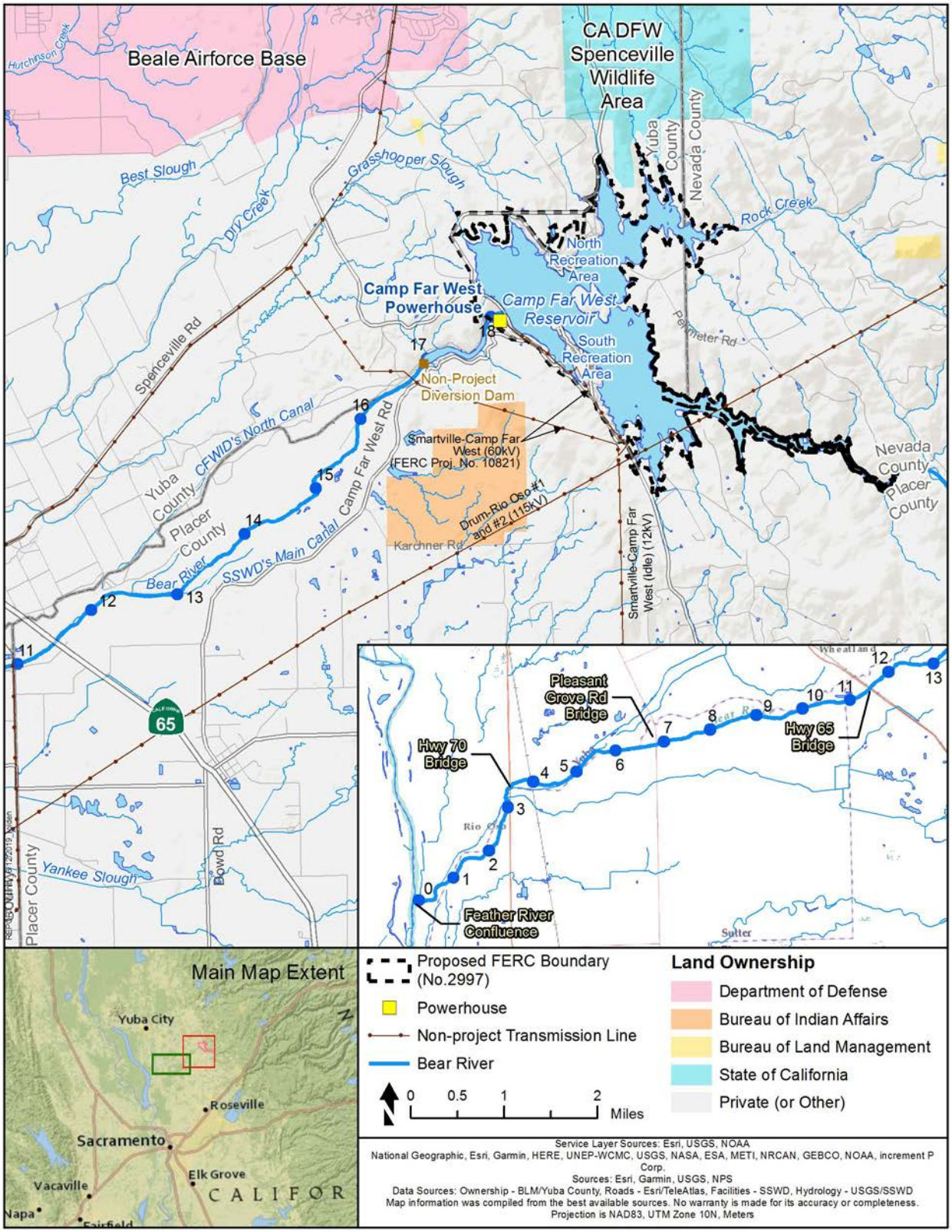


Figure 2.0-2. SSWD's Camp Far West Hydroelectric Project and Project Vicinity.

3.0 Existing Project Facilities and Features

The existing Project consists of one development - Camp Far West – that, in total, includes: one main dam; one powerhouse with an associated switchyard with a capacity of 6.8 megawatts (MW); and appurtenant facilities and structures, including recreation facilities and gages.

The Project does not include any open water conveyance facilities, transmission lines, active borrow or spoil areas, the diversion dam[2] located downstream from Camp Far West Dam, SSWD's Main Canal, Camp Far West Irrigation District's (CFWID) North and South canals, or the intake structures to these water delivery canals.

Table 3.0-1 and Table 3.0-2 summarize key information for the Project's powerhouse and reservoir, respectively.

Table 3.0-1. Key information regarding the Camp Far West Hydroelectric Project's powerhouse.

Powerhouse	Unit	Turbine Type	Rated Head (ft)	Rated Hydraulic Capacity (cfs)		Generation Capacity (kW)		Average Annual Energy (MWh/yr)[3]
				Minimum	Maximum	Nameplate Rating[1]	Dependable[2]	
Camp Far West	1	Francis	143	200	725	6,800	3,750	26,900

[1] Manufacturer's stated turbine and/or generator capacity, as shown on equipment nameplate.

[2] Defined as the average available capacity during the period of highest demand within the driest recent historical period, which for this purpose is July and August 1977.

[3] Megawatt hours: 1,000 kilowatt hours.

Table 3.0-2. Key morphological information regarding the Camp Far West Hydroelectric Project's reservoir.

Project Reservoir	NMWSE (ft)	Gross Storage[1] (ac-ft)	Usable Storage[2] (ac-ft)	Surface Area[3] (ac)	Maximum Depth[3] (ft)	Shoreline Length[3] (mi)	Drainage Area At Dam (sq mi)
Camp Far West	300	93,737	91,327	1,886	155	29	284

Key: NMWSE = normal maximum water surface elevation; ft =feet; ac-ft = acre-feet; ac = acres; mi = miles; and sq mi = square miles

[1] Defined as the reservoir storage between the NMWSE and the bottom of the reservoir.

[2] Defined as the reservoir storage between the NMWSE and the invert of the 72-inch hollow jet valve level outlet (i.e., 175 ft), below which there is 2,500 ac-ft of reservoir storage that is not available for release (i.e., dead storage).

[3] At NMWSE.

Existing Project facilities and features are described below.

[2] The non-Project diversion dam is approximately 1.3 mi downstream of Camp Far West Dam, and is a 38-ft high overflow dam where up to approximately 40 cfs is diverted into CFWID's South Canal, 435 cfs into SSWD's Main Canal, and 35 cfs into CFWID's North Canal. The water delivery period typically extends from April 15 through October 15, depending on the water year. SSWD initiates water deliveries by installing flashboards on the diversion dam (i.e., in accordance with the California Division of Safety of Dam, the flashboards cannot be in place from November 1 to April 1), which provides the head for the diversions into the canals. Water is released from the non-Project diversion dam into the Bear River through a fish release valve (refer to Section 3.8 in this Exhibit A). Higher flows spill over the diversion dam.

3.1 Main Dam and Auxiliary Dams

3.1.1 Main Dam

The first Camp Far West Dam was a 50-ft high concrete gravity structure built by the CFWID in 1927. Construction on the current dam was completed in January1964 by SSWD as part of the California State Water Plan to enhance water supply in California's Central Valley. Camp Far West Dam and Reservoir are not part of California's State Water Project.

The main embankment of the existing dam is a zoned earthfill structure, which is 185 ft high, 40 ft wide at the crest and 2,070 ft long. The dam has variable 2 to 1, 2.5 to 1, and 3 to 1 upstream slopes, with a 60-ft wide beam at an elevation of 200 ft, and a 2 to 1 downstream slope. The certified crest of the dam is at an elevation of 320 ft and has an additional 2.2 to 3.1 ft of camber resulting from roadway construction along the dam crest.

The central impervious core of the main embankment is comprised of compacted silts, clays, and gravels. Upstream from the core is a compacted shell of sand, gravel, and cobbles. Downstream and separated from the core by an inclined chimney drain is a shell of compacted clays and silts, which is further overlain by a shell of compacted rock with soil fines. Underlying the center portion of the embankment over the original river channel and extending from the 12-ft thick inclined chimney drain to the downstream toe is a 6-ft-thick, 100-ft-wide horizontal drain blanket. Both upstream and downstream slopes of the embankment are covered with a layer of riprap having a maximum diameter of 3 ft.

Figure 3.1-1 shows the Camp Far West Dam.

Figure 3.1-1. Photograph of some Camp Far West Hydroelectric Project facilities and features.

3.1.2 North and South Wing Dams

Adjacent to the left abutment of the main embankment is the south wing dam constructed of earthfill with a maximum height of 45 ft, a crest width of 20 ft, and length of 1,060 ft. Constructed to the north of the main embankment opposite the spillway is the north earthfill wing dam that is 25 ft in height, 20 ft in width at the crest, and 1,460 ft in length. The upstream slopes of the south and north wing dams are 2.5 to 1 and 3 to 1, respectively. The downstream slopes of both wing dams are 2.5 to 1. The north and south wing dams are constructed of compacted clays and silts. The upstream outside slope of the two wing dams is covered with 3 ft of riprap underlain by an 18-in. layer of gravel bedding. The downstream slope of the south wing dam is protected by a layer of riprap with a minimum thickness of 3 ft.

3.1.3 North Dike

The Project includes an earthfill dike constructed to the north of the north wing dam, and referred to as the north dike. The north dike is 15-ft-high, has a crest length of 1,450 ft, and a crest width of 20 ft. The nominal elevation at the top of the dike is 320 ft.

3.2 Camp Far West Reservoir

When the main dam was built, the reservoir had a surface area of 2,020 ac and storage volume of 104,000 acre-feet (ac-ft) at the Normal Maximum Water Surface Elevation (NMWSE) of 300 ft. Based on recent SSWD topographic and bathymetric surveys, the current reservoir surface area is 1,886 ac with a gross storage capacity of approximately 93,737 ac-ft at the NMWSE of 300 ft. The reservoir contains 1,307 ac-ft and has a surface area of about 74 ac at its minimum operating elevation of 175 ft, below which the reservoir storage is not available for release (i.e., dead storage). Maximum reservoir depth is approximately 155 ft, relative to the NMWSE. Figure 3.2-1 shows Camp Far West Reservoir.

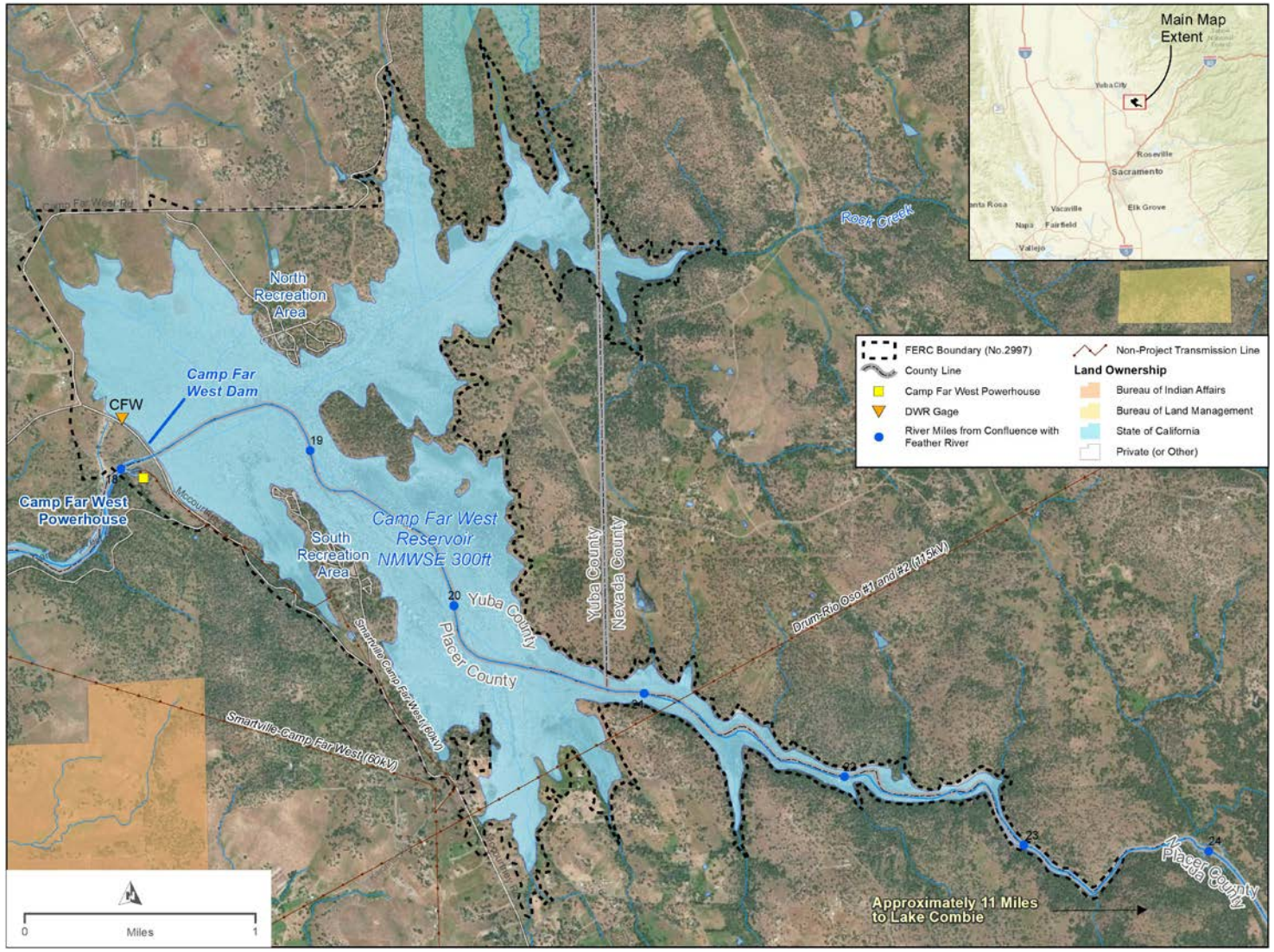


Figure 3.2-1. Camp Far West Reservoir and associated facilities and features.

3.3 Camp Far West Spillway

3.3.1 Existing Spillway

An overflow spillway is located adjacent to the right abutment of the Camp Far West main dam. The spillway structure consists of a 15-ft-wide reinforced concrete approach apron with the invert at 290 ft, an ungated, ogee-type reinforced concrete structure with a crest length of 300 ft, and a 77-ft long downstream reinforced concrete chute with vertical reinforced concrete counterforted sidewalls. The spillway crest elevation is 300 ft. The channel downstream of the spillway terminates in a chute excavated in solid rock. This unlined channel then joins the Bear River approximately 1,200 ft below the main dam. A 302.5-ft single-span, steel-truss bridge across the spillway crest provides access across the dam. The spillway has a maximum design capacity of 106,500 cubic feet per second (cfs) at a reservoir elevation of 320 ft. Figure 3.1-1 shows the existing Camp Far West Dam Spillway.

3.3.2 Ongoing Spillway Modification to Meet Probable Maximum Flood

In 2005, the probable maximum flood (PMF) was recalculated for the Camp Far West Hydroelectric Project resulting in a Camp Far West Dam spillway capacity of less than the PMF and consequently inadequate spillway capacity. Since the existing spillway capacity at NMWSE (i.e., 106,500 cfs) is less than the recalculated peak outflow during the PMF (i.e., approximately 126,600 cfs [NHC 2006]), FERC directed SSWD to increase the spillway capacity to accommodate passage of the revised PMF and avoid overtopping the dam at a reservoir elevation of 320 ft. Similarly, the California Division of Safety of Dams (DSOD) directed SSWD to increase the spillway capacity to ensure passage of the revised PMF with 1.0 ft of freeboard at the dam. The modification is needed to assure that the Camp Far West Dam spillway could accommodate the PMF wherein water would flow over the spillway rather than overtop the dam embankment thereby avoiding the risk of dam failure along with sudden and significant downstream flooding. SSWD is coordinating with FERC and DSOD to modify the spillway, as directed.

At the time this Application for New License is filed, the spillway modification, which has been agreed to by FERC,[3] includes the following:

- New Auxiliary Spillway Structure. The proposed new auxiliary spillway structure would be an ogee-type weir, horizontally concaved, with a crest length of 300 ft. The spillway would be constructed of reinforced concrete and be of similar design to the existing, adjacent spillway structure. Although the auxiliary spillway is being constructed to elevation 305 ft, it will not affect the existing Camp Far West Reservoir NMWSE because the reservoir will still spill over the existing elevation 300 ft spillway: the auxiliary spillway would only be activated at higher inflows.

[3] FERC approved the spillway modification in a memo filed on July 3, 2007 (Accession No. 200170709-0225).

- New Inlet Channel. A new unlined spillway inlet channel would be excavated upstream of the auxiliary spillway structure, within the Camp Far West Reservoir area, to divert water to the new auxiliary spillway. The width of the new auxiliary inlet channel would be a minimum of 300 ft at its narrowest, and the bottom elevation of the channel would be a constant 290 ft elevation. The side slopes of the channel would be constructed at 1:1 slopes where moderately weathered or un-weathered rock is encountered and 2:1 slopes for all other material types.
- New Outlet Channel. A new unlined auxiliary spillway outlet channel would be constructed downstream of the new auxiliary spillway structure to convey water back to the existing spillway channel. The channel would be approximately 805 ft long with a slope varying from -3 percent to -5.6 percent. The side slopes of the channel would be constructed at 1:1 slopes where moderately weathered or un-weathered rock is encountered and 2:1 slopes for all other material types.
- New Bridge. A new approximately 300-ft-long bridge would be constructed for the new auxiliary spillway to provide continuity and allow vehicular traffic to pass over the dam and along Blackford Road. The bridge would be constructed of precast concrete girders, and consist of side concrete barriers and a paved road surface. Guardrails would be placed at the ends of the bridge for transition from the road to the bridge. The bridge would be supported by concrete abutments at each end and two additional piers, evenly spaced.
- Grading and Raising Existing Blackford Road. Construction of the new bridge to a top-of-paved-surface-elevation of 325 ft would require the existing Blackford Road to be raised approximately 15 ft at the west end of the proposed new bridge to accommodate the approach to the bridge over the new auxiliary spillway. The new bridge would ramp back down to the existing road grade on the east end. Fill would be required on the west end of the bridge in order to accommodate the approach to the new spillway bridge. Maximum grade would be approximately 6 percent, similar to existing maximum grade. The road width would be 24 ft along Blackford Road and 20 ft along Camp Far West Road. Fill side slopes would be constructed at 2:1.
- Relocation of Existing Powerline. A segment of an existing distribution powerline, which is located just south of the proposed new auxiliary spillway and owned and operated by Pacific Gas and Electric (PG&E), would be relocated. The line serves only as a distribution line from the Camp Far West Powerhouse switchyard to the main grid and would not disrupt power distribution to other users.

SSWD anticipates that the auxiliary spillway would be constructed in the course of 3 months in fall 2020 and 5 months in spring-summer 2021.

When the spillway modification is complete, the auxiliary spillway in combination with the existing spillway will have a combined capacity of 134,600 cfs at a water surface elevation of 318.5 ft.

For the purposes of this Application for New License, SSWD assumes the spillway modification is fully implemented under the existing license and is in place when FERC issues a new license for the Project.

3.4 Water Intakes and Water Conveyance Systems

3.4.1 Intakes

There are two intake structures associated with the Camp Far West Dam; the power intake that was constructed when hydropower was added to the dam, and the intake structure for the outlet works. Both structures are submerged for most of the year and are located at the upstream toe of the main dam.

The power intake structure consists of a reinforced concrete ungated vertical intake tower 22-ft-high, with openings on three sides; two 10-ft-wide by 14-ft-high and one 10-ft-wide by 10-ft-high. The openings are protected by steel trashracks on 6-in. centers. A concrete bulkhead enables positive closure and the sill elevation measures 197.0 ft.

The intake for the outlet works consists of a reinforced concrete ungated vertical intake tower 25-ft-4 in. high, with openings on three sides – each 7-ft-wide by 8-ft-high. The openings are protected by steel trashracks on 6-in. centers and the sill elevation measures 175.0 ft.

3.4.2 Water Conveyance Systems

There are three main conveyance systems associated with the Camp Far West Dam. The overflow spillway discussed above flows into an unlined rock conveyance channel that carries the spill back into the Bear River downstream of the dam.

The power intake structure described above connects to a 760-ft-long, 8-ft diameter concrete tunnel through the left abutment of Camp Far West Dam that conveys water directly to the Camp Far West Powerhouse, which discharges to the Bear River at the base of Camp Far West Dam.

A 350-ft-long 48-in. diameter steel pipe connects the intake structure for the outlet works described above to a valve chamber, and a 400 ft long, 7.5-ft diameter concrete-lined horseshoe tunnel connects the valve chamber to a 48-in. diameter Howell Bunger outlet valve on the downstream face of Camp Far West Dam. The valve has a release capacity of 500 cfs at NMWSE and discharges directly into the Bear River.

Each facility is shown on Figure 3.1-1.

3.5 Camp Far West Powerhouse

The powerhouse was constructed in conjunction with the addition of hydropower licensed in 1981 after Camp Far West Dam was built and in operation. The powerhouse is an above-ground,

steel reinforced concrete structure that houses a single vertical-shaft Francis-type turbine. The turbine-generator unit is rated at 6,800 kilowatts (kW) under a rated head of 143 ft and a rated flow of 725 cfs. The unit includes a synchronous three-phase, 13.6 kilovolt (kV) generator with a capability of 6,800 kW. The intake is submerged in the reservoir. Figure 3.1-1 shows the Camp Far West Powerhouse.

3.6 Camp Far West Switchyard

The Camp Far West Switchyard is a fenced switchyard adjacent to the Camp Far West Powerhouse containing a 6/8 NVA, OH/FA, three phase, 13.8 kV – 60 kV, delta-ground wye power step-up transformer; a 60 KV, 31, 60 Marts, 600 ampere, 1,000 MVA short circuit bulk oil circuit breaker; and appropriate disconnect switches. The switchyard also contains PG&E electrical equipment facilities that are not part of the Project. Figures 3.1-1 shows the Camp Far West Switchyard.

3.7 Camp Far West Reservoir Recreation Facilities

There are two developed recreational areas on the Camp Far West Reservoir, both of which are owned by SSWD and leased to a private concessionaire to operate. The North Shore Recreation Area (NSRA) is located off of Camp Far West Road in Wheatland, CA. This campground is currently open year-round. The South Shore Recreation Area (SSRA) is located off of McCourtney Road (Placer Co. C6037) in unincorporated Lincoln, CA, and is only open from mid-May until September. The boat launching facility at the NSRA was reconstructed in 2003-2004. Table 3.7-1 provides details of the recreation facilities at the NSRA and the SSRA. Figure 3.1-2 shows the locations of the NSRA and SSRA. Figure 3.1-7 shows representative photographs of Project recreation facilities.

Table 3.7-1. Camp Far West Hydroelectric Project recreation facilities.

Facility	Amenity	North Shore Recreation Area	South Shore Recreation Area
Family Campgrounds	No. Sites (standard)	70	67
	Sites (RV with hookups)	10	none
	Parking Spurs	1 spur per site	1 spur per site
	Overflow Parking Spaces	None	18 single
	Restrooms	2 flush	1 flush, 2 vault
Group Campgrounds	Sites	2, 25-person group sites, 1, 50-person horse camp site	1, 50-person group site
	Parking Spaces	None[1]	10
	Restrooms	4 portable chemical toilets	None[2]
Day Use Areas	Picnic Sites	20	33
	Swim Beaches	1	1
	Parking Spaces	None[3]	44
	Restrooms	1 flush	None[4]
Boat Ramps	Number	1, 4-lane concrete ramp	1, 2-lane concrete ramp
	Parking Spaces	82 single, 73 vehicle with trailer	52 vehicle with trailer
	Restrooms	1 flush	1 flush
Dispersed Use Areas[5]	Sites	2	2
	Restrooms	6 portable chemical toilets	6 portable chemical toilets

Table 3.7-1. (continued)

Facility	Amenity	North Shore Recreation Area	South Shore Recreation Area
Other Facilities	Entrance Station	1	1
	Store	1	1
	RV Dump Station & Holding Pond	1	1
	Concessionaire Trailers	2	1
	Water Treatment Plant	1	None[6]
	Water Storage Tank	1, 60,000-gallon tank	None[6]

[1] The group campsites use the adjoining family campground restroom building.
[2] Parking is available in open areas adjacent to the group sites, but is not designated or defined.
[3] The day use area (picnic area and swim beach) uses the adjoining boat ramp parking area for parking.
[4] The picnic area uses the adjoining boat ramp restroom building.
[5] The dispersed use areas provide day use and overnight opportunities with minimal facilities (roads, portable chemical toilets and trash cans).
[6] Water is piped under the reservoir to South Shore Recreation Area from the North Shore Recreation Area treatment plant and storage tank.

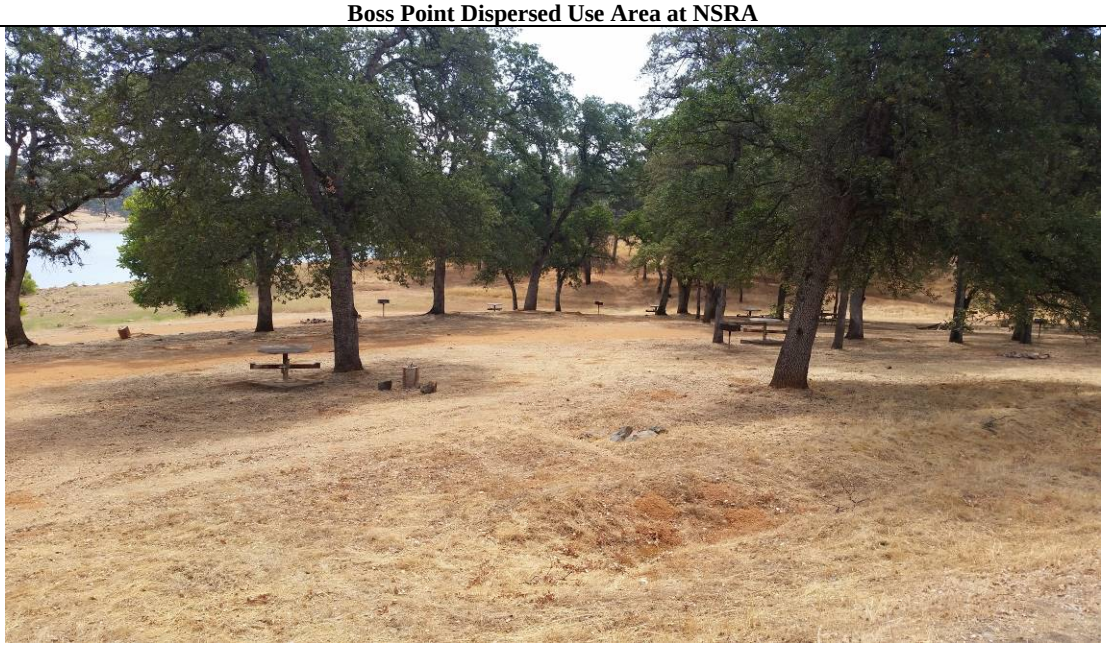
A recreational water system source is Camp Far West Reservoir, where two pumps in the reservoir deliver water at 70 gallons/minute (5,000,000 gallons or 15.3 ac-ft per year) uphill via underground piping to the water treatment facility in the NSRA. After being treated, the water is piped nearby to a 60,000-gallon storage tank constructed of belted steel and recently installed in 2011. From the storage tank, underground distribution piping sends the water throughout the NSRA and SSRA. The SSRA facilities are connected via two pipes under the reservoir that sends the water from the NSRA to the SSRA.

Both NSRA and SSRA have a sewage holding pond with an aerator to handle the sanitary needs of the flush restroom buildings and the RV dump stations at each recreation area. The NSRA and SSRA ponds have surface areas of approximately 1.5 and 0.5 ac, respectively. The NSRA sewage system uses a gravity-feed operation and is supplemented by a pump to get the sewage up to the holding pond. The SSRA sewage system is a gravity-fed system. SSWD maintains the sewage ponds in conformance with a permit issued by the Central Valley Regional Water Quality Control Board.

Family Campground campsite at NSRA

Boat Ramp at NSRA

Boss Point Dispersed Use Area at NSRA



Picnic Area at SSRA

Sewage Pond at NSRA

Water Treatment Facility at NSRA

Water Storage Tank at NSRA

Figure 3.7-1. Representative photographs (dated 07/21/15) of Project recreation facilities.

3.8 Gages

Flow data for the Project comes from four gages, data for two of which are published by the USGS (Table 3.8-1). SSWD also measures spill through the Camp Far West Dam spillway by indirect stage method.

Table 3.8-1. Streamflow and other gages in the Camp Far West Hydroelectric Project Vicinity.

United States Geological Survey (USGS) Identifier	California Data Exchange Center (CDEC) Identifier[1]	Gage Name	Measures
--	--	Camp Far West Dam Low-Level Outlet Flowmeter[2]	Low-level outlet discharge
--	--	Camp Far West Powerhouse Flowmeter[2]	Powerhouse discharge

Table 3.8-1. (continued)

United States Geological Survey (USGS) Identifier	California Data Exchange Center (CDEC) Identifier[1]	Gage Name	Measures
11423700[3]	CFW[4]	Bear River at Camp Far West Dam (Camp Far West Reservoir)	Reservoir Stage and Storage
11423800[5]	CFW[6]	Bear River Fish Release below Camp Far West Reservoir	Compliance with flow requirements in Existing FERC License

[1] Unlike USGS data which are reviewed for quality by USGS prior to publishing the data, CDEC data are not reviewed by CDEC before being made available.

[2] Flowmeters below Camp Far West Dam at low-level outlet and powerhouse are currently maintained by the Sacramento Municipal Utility District (SMUD) and data are not reported publicly.

[3] USGS gage 11423700 measured Camp Far West Reservoir storage, but has not been reported by USGS since September 30, 1983.

[4] CDEC gage CFW, maintained by DWR Flood Management, reports real-time Camp Far West Reservoir stage and end-of-month Camp Far West Reservoir storage-.

[5] USGS Gage 11423800, maintained by USGS, reports river flow below the non-Project diversion dam for compliance with the FERC license. It is not a full flow gage.

[6] CDEC gage CFW reported computed flow downstream from Camp Far West Dam, but is inactive as of June 1, 2018.

Figure 3.8-1 shows the fish release valve in the non-Project diversion dam. Water is released through a slide gate into a concrete structure on the south-side of the non-Project diversion dam. The structure includes a rectangular notch and weir plate. The water level is measured to determine the depth of flow over the weir and calculate flow.

Figure 3.8-1. Camp Far West Hydroelectric Project minimum flow compliance gage (USGS Gage 11423800, Bear River Fish Release below Camp Far West Reservoir.

Seven gages exist downstream of the Project. One gage is a stage gage that measures the stage of the pool formed by the non-Project diversion dam, and the other six are flow gages. One flow gage is located on CFWID's North Canal to measure diversions into the canal from the Bear River. Two flow gages are located on SSWD's Main Canal: one gage measures diversions from SSWD's Main Canal into CFWID's South Canal, and the second gage is located further along the Main Canal and measures flow in the Main Canal past the CFWID's South Canal withdrawal.[4] The fourth flow gage is USGS Gage 11424000, *Bear River near Wheatland*, reported by California Data Exchange Center (CDEC) as BRW, *Bear River near Wheatland*, located 6.5 mi downstream from Camp Far West Dam, 200 ft downstream of the State Highway 65 bridge crossing, which is a full-flow gage and is maintained by USGS and DWR. The last flow gage is CDEC Gage BPG, *Bear River at Pleasant Grove Road*, a full-flow gage maintained

[4] SSWD Main and Canal and CFWID South Canal and North Canal diversions are measured and reported in compliance with CA SWRCB Surface Water Measurement and Reporting Regulations (California Code of Regulations, Title 23, Chapters 2.7 and 2.8). Beginning January 1, 2020, hourly diversion data will be reported weekly, and will be publicly available.

by DWR and located 10.5 mi downstream from Camp Far West Dam. Figure 3.8-2 shows the location of the gages.

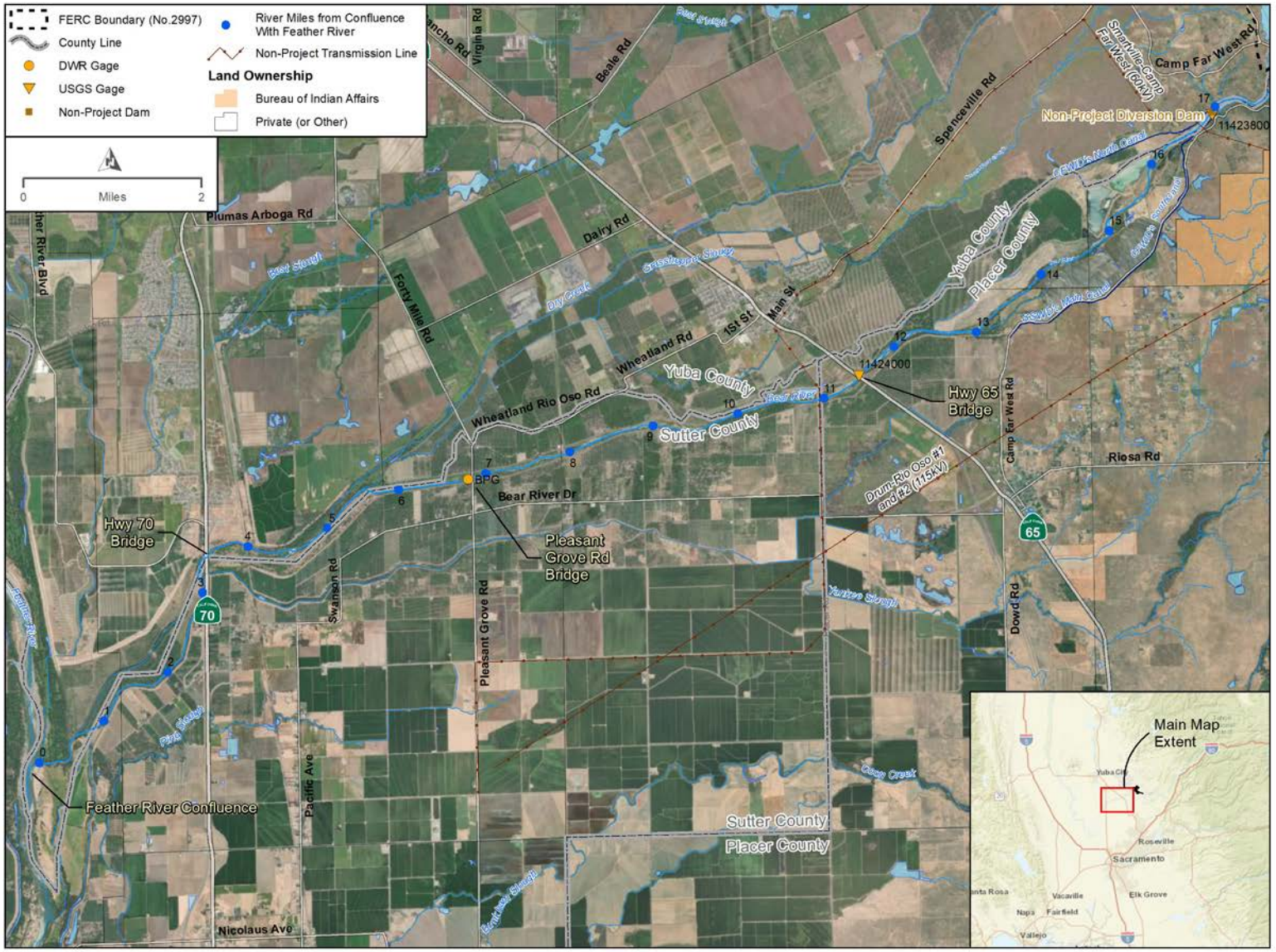


Figure 3.8-2. Location of streamflow gages.

3.9 Primary Project Roads and Trails

There are no Primary Project Roads or Trails explicitly included in the existing FERC-licensed Project facilities.

4.0 Existing Project Boundary

The FERC Project Boundary is intended to consist of all lands necessary for the safe operations and maintenance of the Project and other purposes, such as recreation, shoreline control, and protection of environmental resources. For the Camp Far West Hydroelectric Project, the existing FERC Project Boundary encompasses 2,863.7 ac of land. SSWD owns over 95 percent (2,710.5 ac) of the land within the boundary, and the remaining 5 percent (153.2 ac) of the land is owned by private parties – no federal or state land occurs within or adjacent to the FERC Project Boundary or along the Bear River downstream of the Project. The boundary generally follows the 320 ft elevation contour around Camp Far West Reservoir with the exception of the additional lands included at the northwest end of the reservoir that include the NSRA and additional lands included at the southwest end of the reservoir that include the SSRA.

5.0 Proposed Changes to Existing Project

SSWD proposes three general changes to existing Project facilities: 1) raising the NMWSE of Camp Far West Reservoir by 5 ft from an elevation of 300 ft to an elevation of 305 ft;[5] 2) modifications to Project recreation facilities at Camp Far West Reservoir; and, 3) addition of a single Primary Project Road. In addition, SSWD proposes a slight modification to the existing FERC Project Boundary. Each of these is discussed below.

5.1 Camp Far West Reservoir Pool Raise

Recent aerial surveying and topographic mapping shows that Camp Far West Reservoir stores 93,737 ac-ft of water at its existing Camp Far West Reservoir NMWSE of 300 ft. This is roughly 10 percent less than anticipated when the dam was enlarged in 1964, and the amount authorized in SSWD's water rights. Therefore, SSWD proposes to raise the NMWSE of Camp Far West Reservoir by 5 ft to an elevation of 305 ft. The Pool Raise would increase Camp Far West Reservoir storage by 9,836 ac-ft to a capacity of 103,573 ac-ft at Camp Far West Reservoir's new NMWSE of 305 ft.

The Pool Raise would involve demolition of the concrete cap on the existing Camp Far West Dam spillway, the addition of approximately 1,730 cy of concrete to raise the existing spillway crest from an elevation of 300 ft to an elevation 305 ft, and anchoring of the new concrete with steel dowels. The spillway design would not change from its existing reinforced concrete,

[5] For the purpose of this exhibit, this is referred to as the "Pool Raise."

ungated, ogee-type weir and the existing 300-ft crest length will not change. In addition, no changes would be required to the ongoing spillway modification. Figure 5.1-1 is a general conceptual-level plan showing the details of the Pool Raise. Figures 5.1-2 and 5.1-3 show profiles of the existing spillway and Blackford Road profiles. Figure 5.1-4 shows additional typical sections of the existing spillway. When the Pool Raise is complete, the auxiliary spillway in combination with the modified existing spillway will have a combined capacity of 126,600 cfs at a water surface elevation of 318.5 ft. Exhibit B describes Project operations with the Pool Raise, and Exhibit C presents SSWD's current plan for the Pool Raise construction. Estimated cost of the Pool Raise is provided in Exhibit D.

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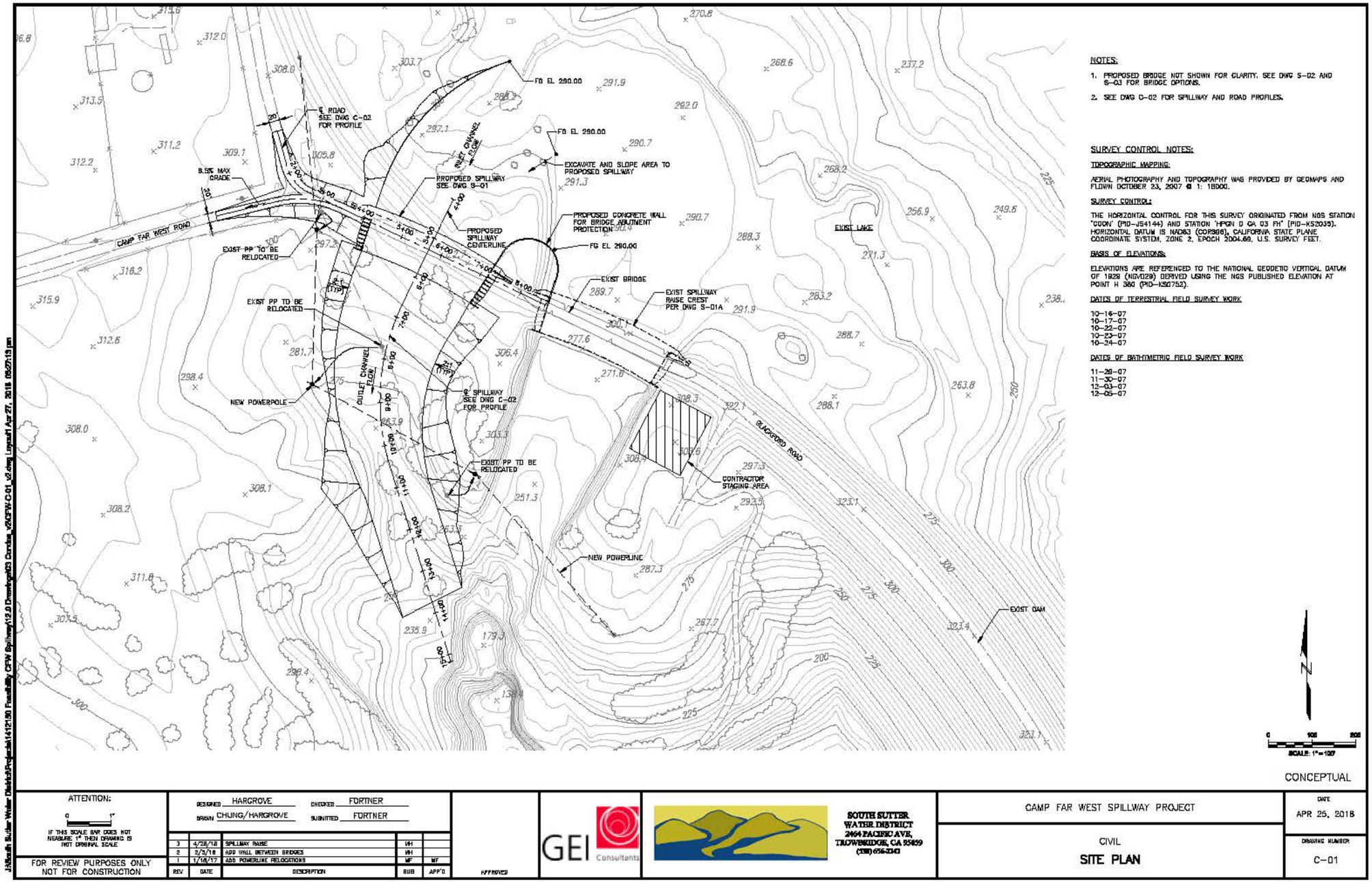

NOTES:

1. PROPOSED BRIDGE NOT SHOWN FOR CLARITY. SEE DWG S-02 AND S-03 FOR BRIDGE OPTIONS.
2. SEE DWG C-02 FOR SPILLWAY AND ROAD PROFILES.

SURVEY CONTROL NOTES:

TOPOGRAPHIC MAPPING:

AERIAL PHOTOGRAPHY AND TOPOGRAPHY WAS PROVIDED BY GEOMAPS AND FLOWN OCTOBER 23, 2007 @ 1: 18000.

SURVEY CONTROL:

THE HORIZONTAL CONTROL FOR THIS SURVEY ORIGINATED FROM NGS STATION "COON" (PID-JS4144) AND STATION "HPGN D CA 03 FH" (PID-KS2035). HORIZONTAL DATUM IS NAD83 (CORS96), CALIFORNIA STATE PLANE COORDINATE SYSTEM, ZONE 2, EPOCH 2004.00, U.S. SURVEY FEET.

BASIS OF ELEVATIONS:

ELEVATIONS ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) DERIVED USING THE NGS PUBLISHED ELEVATION AT POINT H 380 (PID-KS0752).

DATES OF TERRESTRIAL FIELD SURVEY WORK

10-16-07
10-17-07
10-22-07
10-23-07
10-24-07

DATES OF BATHYMETRIC FIELD SURVEY WORK

11-28-07
11-30-07
12-03-07
12-05-07

ATTENTION:
0 1"
IF THIS SCALE BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT ORIGINAL SCALE

FOR REVIEW PURPOSES ONLY
NOT FOR CONSTRUCTION

DESIGNED HARGROVE CHECKED FORTNER
DRAWN CHUNG/HARGROVE SUBMITTED FORTNER

REV	DATE	DESCRIPTION	BUB	APP'D
3	4/28/18	SPILLWAY RAISE	VH	
2	2/5/18	ADD WALL BETWEEN BRIDGES	VH	
1	1/16/17	ADD POWERLINE RELOCATIONS	MF	MF

APPROVED

GEI Consultants

SOUTH SUTTER WATER DISTRICT
2464 PACIFIC AVE.
TROWBRIDGE, CA 95659
(530) 656-2043

CAMP FAR WEST SPILLWAY PROJECT

CIVIL
SITE PLAN

DATE
APR 25, 2018

DRAWING NUMBER
C-01

Figure 5.1-1. Conceptual level plan for Camp Far West Reservoir Pool Raise – general plan.

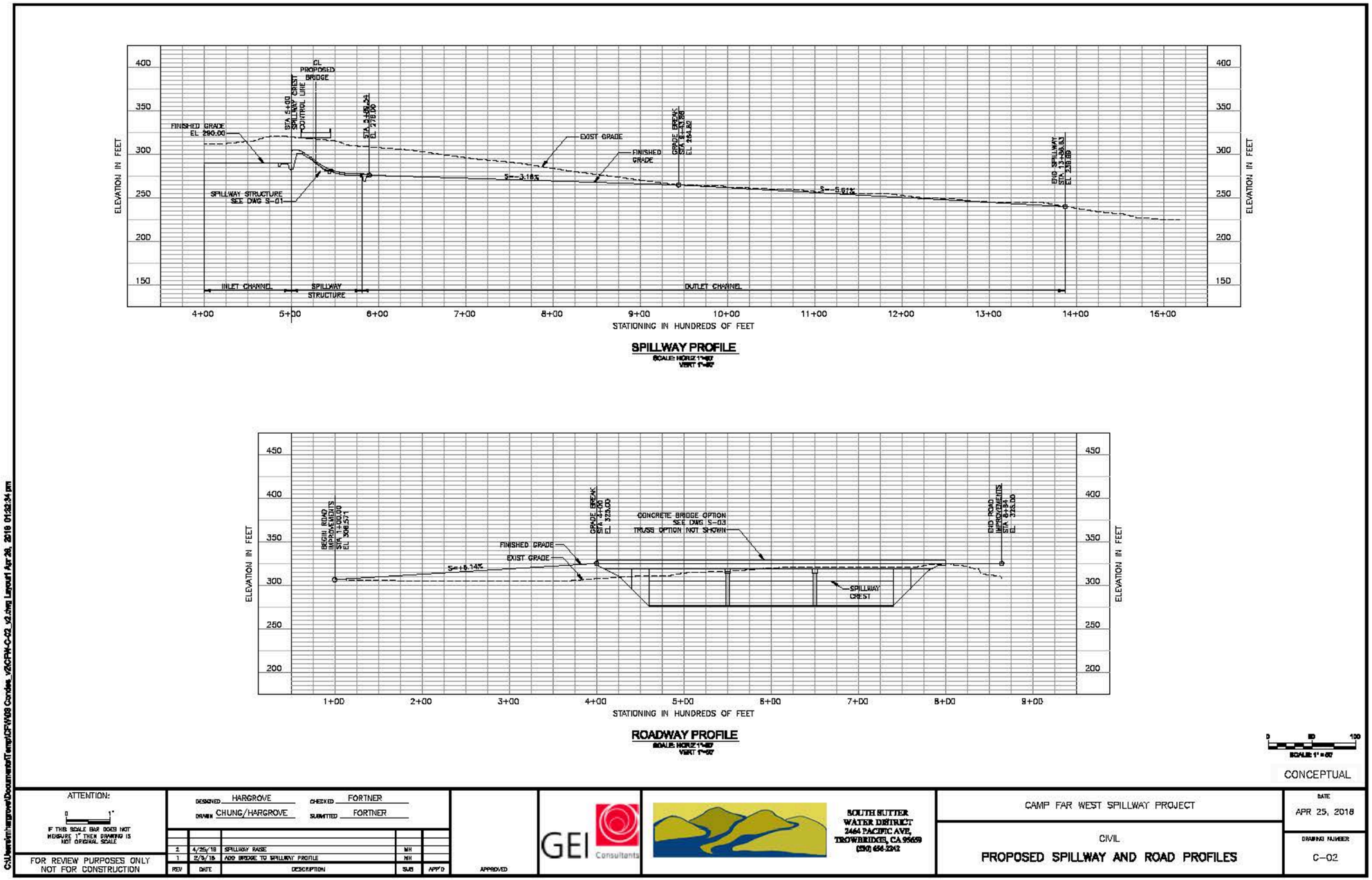

Figure 5.1-2. Conceptual level plan for Camp Far West Reservoir Pool Raise – spillway and road profiles.

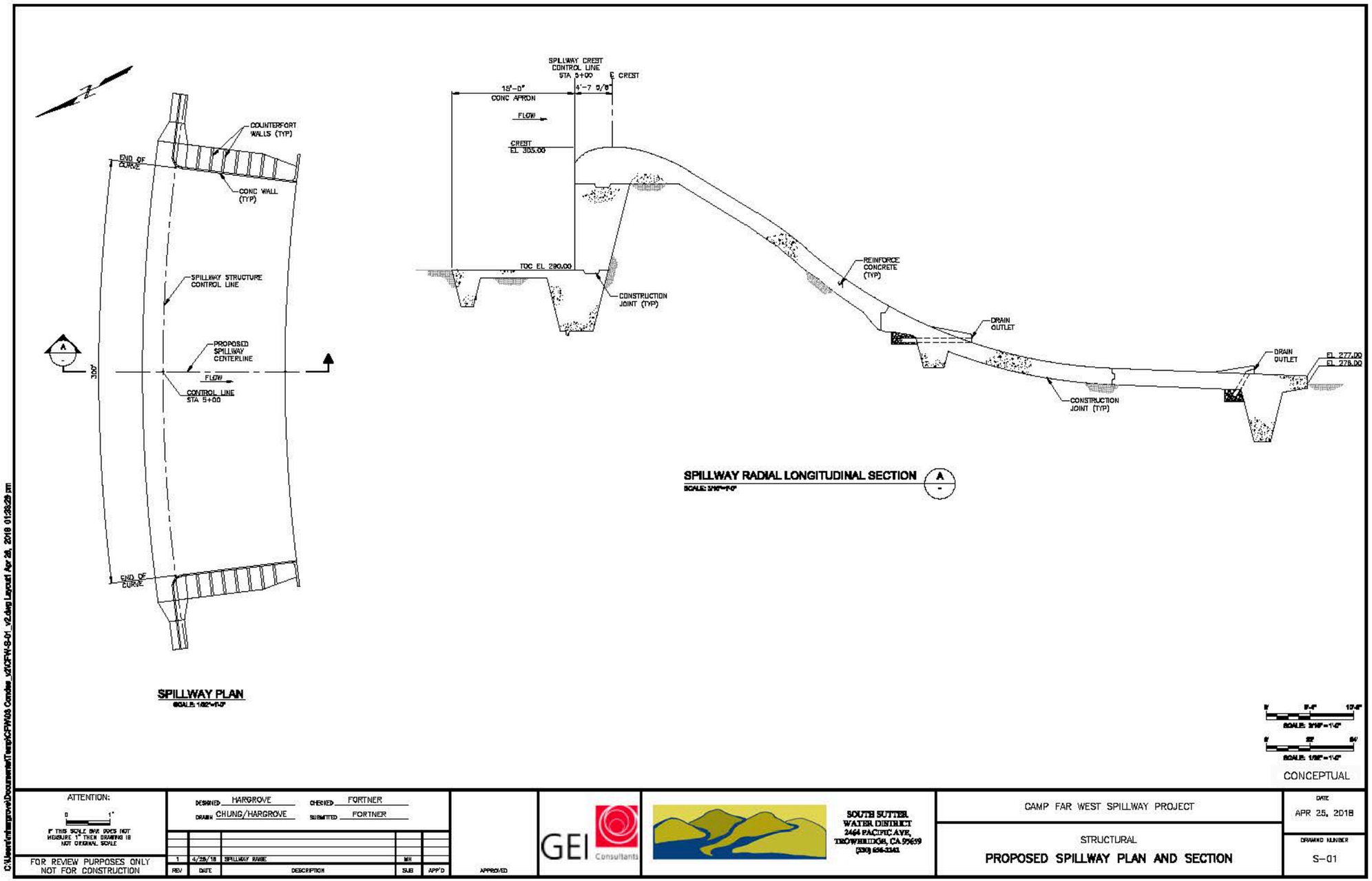

Figure 5.1-3. Conceptual level plan for Camp Far West Reservoir Pool Raise – spillway and road typical sections.

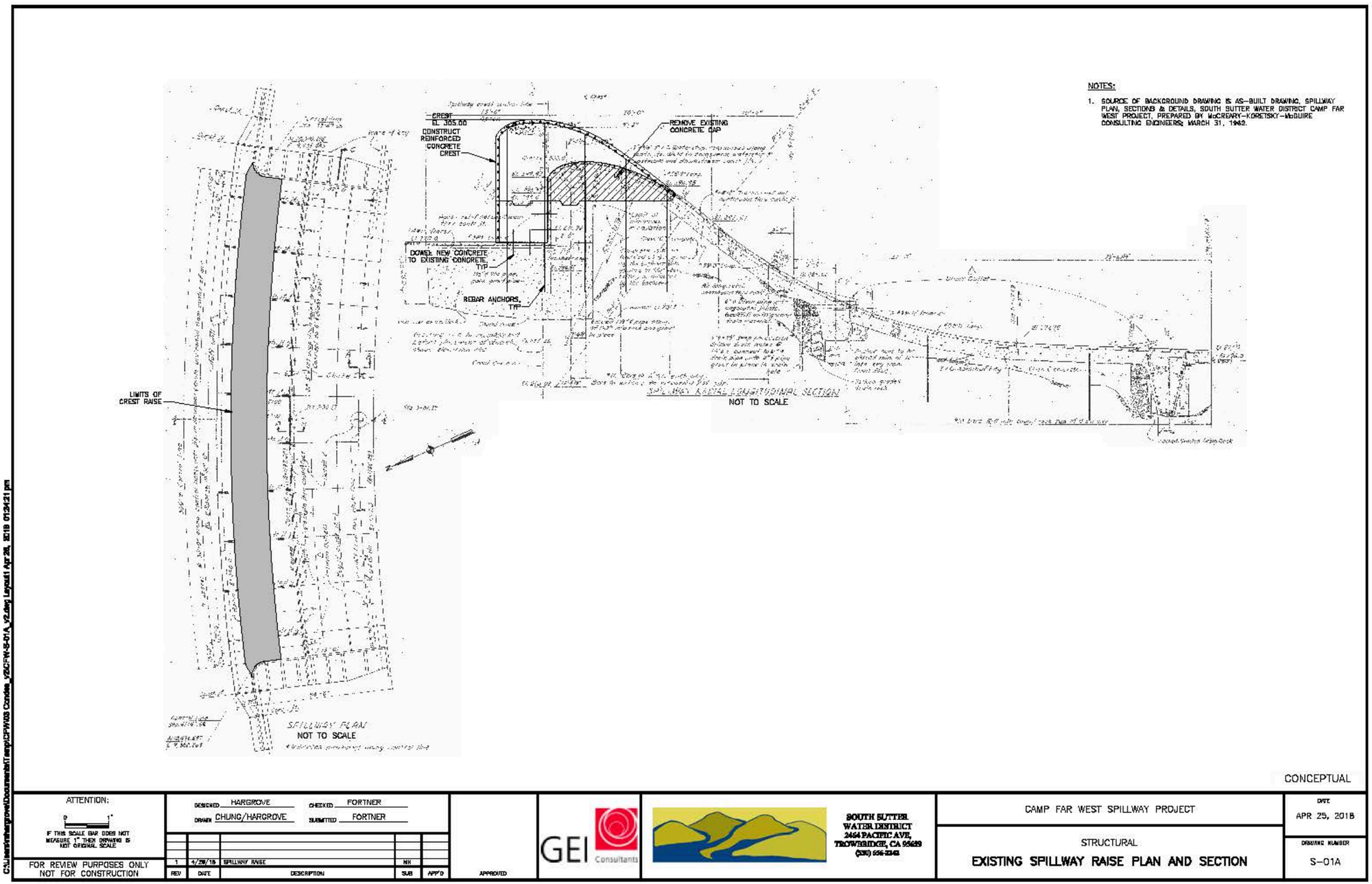

Figure 5.1-4. Conceptual level plan for Camp Far West Reservoir Pool Raise - spillway typical section.

5.2 Recreation Facilities

While the Project RAs are able to meet the current and future recreational demand, some of the recreation facilities are in need of replacement or rehabilitation to maintain the proper functioning condition of the facility. Nearly all of the facilities will require replacement or rehabilitation during the term of the new license to maintain the facilities in proper functioning condition; and, particularly the restrooms, potable water system and the circulation roads, which will need near-term rehabilitation in order to provide facilities in a safe and proper functioning condition. When constructing or rehabilitating Project recreation facilities, SSWD will obtain all necessary permits and approval for survey work, facility design and on-site resource evaluations.

As a result of the Pool Raise, approximately 104 recreational facilities or site features would be impacted along the shoreline at the NSRA and SSRA. Most of the impacted features (i.e., 59%) would be directly impacted by the pool raise by either partially or fully inundating the features. In these instances, the inundated features would be relocated, re-routed or re-aligned to avoid inundation. The remaining impacted features (i.e., 41%) would be indirectly impacted, whereby the Pool Raise would not inundate the feature, but would closely abut the feature likely resulting in flooding and/or erosion impacts to the features due to wind, wave or high flow events. In a few instances, a feature would be indirectly impacted and require relocation because an inundated segment of a circulation road would likely be re-aligned through these features. The construction work to relocate, re-route or realign the impacted features would be completed in one calendar year. Overall, the majority of the construction would occur outside the peak recreation season (i.e., Memorial Day through Labor Day holiday weekends). In instances where construction would be necessary during the peak season, the work would be restricted to select areas and conducted during low-use periods (i.e., weekdays) to minimize any impacts to the recreation facilities and visitor experiences.

At NSRA, approximately 57 site features would be impacted, including 21 campsite living spaces (i.e., table and/or grill area), 19 campsite vehicle spurs, 13 circulation road segments (i.e., 2,410 ft of dirt roads and 480 ft of paved roads), 2 boat ramp and parking area segments, 1 picnic site, and 1 water hydrant. The majority of the impacted recreational site features at NSRA would be at the family campground (i.e., 43 impacted features) followed by the dispersed use areas (i.e., 6 impacted features – all dirt roads), group campground (i.e., 4 impacted features), and the day use area and boat launch facilities (i.e., each with 2 impacted features). At the family campground, most of the impacted features would be campsite living spaces and vehicle spurs (i.e., each with 19 impacted sites) with a five impacted road (dirt surface) segments. At the group campground, one of the two group campsites would be fully inundated. At the dispersed use areas, all of the impacted features would be the dirt roads (i.e., 1,410 ft) that provide shoreline access. Overall, most of the impacted features at NSRA (i.e., 61%) would be directly impacted by the pool raise and the remaining impacted features would be indirectly impacted (i.e., features abutting the 305 ft NMWSE).

At SSRA, approximately 47 site features would be impacted, including 15 circulation road segments (i.e., 3,720 ft of dirt roads and 1,140 ft of paved roads), 11 campsite living spaces (i.e.,

table and/or grill area), 9 picnic sites, 7 campsite vehicle spurs, 1 boat ramp turnaround area, 1 parking area, 1 swim beach, 1 water hydrant, and 1 stage. The majority of the impacted recreational site features at SSRA would be at the family campground (i.e., 22 impacted features) followed by the day use area (i.e., 14 impacted features), dispersed use areas (i.e., 9 impacted features – all dirt road segments), the swim beach (i.e., 2 impacted features), and the boat launch (i.e., 1 impacted feature). At the family campground, most of the impacted features would be campsite living spaces (i.e., 11 sites), vehicle spurs (i.e., 7 sites) and road segments (i.e., 3 segments). At the dispersed use areas, all of the impacted features would be the dirt roads (i.e., 2,710 ft) that provide shoreline access. The entire swim beach would be inundated. Overall, most of the impacted features at SSRA (i.e., 55%) would be directly impacted by the Pool Raise and the remaining impacted features would be indirectly impacted (i.e., features abutting the 305 ft NMWSE). Notably, at five campsites in the family campground, the campsite living space and vehicle spurs would be indirectly impacted and require relocation because an inundated segment of the campground circulation road would likely be re-aligned through these campsites.

5.3 Primary Project Road

SSWD proposes to add to the new license as a Primary Project Road an existing road that accesses the Camp Far West Powerhouse. The existing road is within the proposed and existing FERC Project boundaries. The road extends approximately 0.25 miles from an existing SSWD locked gate at Camp Far West Road to the Camp Far West Powerhouse and Switchyard. The existing road is not open to the public for safety reasons, is used and maintained solely by SSWD to access the Camp Far West Powerhouse and Switchyard, and has an asphalt-paved surface approximately 20 ft wide and shoulder width of approximately two feet. While the road was constructed when Camp Far West Powerhouse and Switchyard were constructed and is SSWD's only vehicular access route to Camp Far West Powerhouse and Switchyard, the road is not identified in the existing license as a Project facility. Figure 2.1-1 in this Exhibit as well as Figure 2.0-1 and Attachment G-1 in Exhibit G of the FLA shows the location of the existing road.

Roads associated with recreation facilities are considered in SSWD’s proposed Recreation Facilities Plan.

5.4 Project Gages

SSWD does not propose any changes to Project gages described in Section 3.8.

5.4 FERC Project Boundary

SSWD proposes several changes to the existing FERC Project Boundary in order to more accurately define lands necessary for the safe operation and maintenance of the Project and other purposes, such as recreation, shoreline control, and protection of environmental resources. This includes modifying the existing FERC Project Boundary to remove lands surrounding the Camp Far West 60 kV transmission line, which is part of the Project, and other lands not used for

Project operations. The transmission line, which was built and is owned and operated by PG&E, was originally included in the license application as part of the Camp Far West Hydroelectric Project. However, on April 2, 1991, with the consent of PG&E, the transmission line from the Camp Far West switchyard was removed from the Camp Far West Hydroelectric Project FERC license and added to PG&E's Camp Far West Transmission Line Project (FERC Project No. 10821). SSWD inadvertently did not amend the FERC Project Boundary at that time.

There are two categories of proposed Project Boundary changes:

- Proposed addition of lands to the existing FERC Project Boundary that are currently utilized with a preponderance of use related to the Project operation and maintenance, and proposed removal of lands from the Project Boundary that do not have Project facilities and are not used or necessary for Project O&M. These proposed changes are essentially making corrections to the existing FERC Project Boundary.
- Proposed changes to the existing FERC Project Boundary around the Project reservoir and impoundments from surveyed coordinates to a contour located above the 300' elevation NMWSE or to a distance of 200 ft from the 300-ft elevation NMWSE. These changes are proposed as these are the preferred methods of defining project boundaries as outlined in the FERC Drawing Guide (FERC 2012), provide a minimum of 15 ft of dry shore for all locations around the reservoir and are a better representation of lands required for Project O&M around the Project reservoir.

Proposed changes are discussed below. All proposed changes are described in detail in Section 2.0 of Exhibit G.

SSWD proposes the following changes under the category of corrections to the existing FERC Project Boundary:

- The addition of the areas that encompass rights-of-way for road access to the Camp Far West Powerhouse used to access and maintain the dam outlet and powerhouse. Land in this proposed addition is owned by a private land owner (Placer County Assessor's Parcel Number 018-020-015-000).
- The removal of the land owned by SSWD to the west of the dam spillway (Yuba County Assessor's Parcel Number 015-370-016-000). These lands are not used or needed for Project O&M. Note that the area of the new Spillway Modification to the Bear River is retained in the proposed Project Boundary with a 15 ft buffer.
- The removal of the area in the existing Project Boundary bounded on the north and west by Camp Far West Road, extending to a boundary established at 200' from the NMWSE. This land is not used for Project O&M. Land in this proposed removal is owned by SSWD (Yuba County Assessor's Parcel Numbers 015840021000, 015840020000, 015370016000).

- The removal of the area in the existing Project Boundary bounded on the north by Camp Far West Road, extending to the northern use limit of the North Recreation Area. This land is not used as part of the recreation facility or for Project O&M. Land in this proposed removal is owned by SSWD (Yuba County Assessor's Parcel Number 015840022000).

SSWD proposes the following changes under the category of a contour 20 ft above the 300-ft NMWSE or proximity of 200 horizontal ft from the 300 ft NMWSE:

- The addition and removal of land such that the Project Boundary around Camp Far West Reservoir where the Project Boundary is not encompassing Project facilities is defined by the lesser (closer to reservoir NMWSE) of either the topographic contour of 320 ft, which is 20 ft above the 300-ft NMWSE, or 200 horizontal ft from the 300 ft NMWSE. Lands in this proposed change are a combination of lands owned by private land owners and SSWD. The corrections consist of many small additions and subtractions from the existing FERC boundary based on higher accuracy elevation data made available since the creation of the original boundary geometry. Areas of significant change are limited to the upland reaches of tributary canyons of unnamed creeks where the existing FERC Boundary extends beyond 200 ft horizontally from the 300 ft NMWSE. All of the upland canyon changes are removal of lands included in the existing FERC boundary.

Table 5.4-1 summaries SSWD's proposed changes to the existing FERC Project Boundary.

Table 5.4-1. Summary of proposed changes to the existing FERC Project Boundary.

Owner and Action	Added to Include Primary Project Roads (ac)	Beyond 200 ft from the 300-ft NMWSE (ac)	Correction to 320 ft contour (ac)	Not Used for Project O&M (ac)	Added to include recreation area (ac)	Total (ac)
EXISTING FERC PROJECT BOUNDARY						
Private Lands	--	--	--	--	--	139.6
SSWD Lands	--	--	--	--	--	2,724.1
Total	--	--	--	--	--	**2,863.7**
PROPOSED CHANGES TO EXISTING FERC PROJECT BOUNDARY						
Changes to Private Lands						
addition	+0.7	--	+7.2	--	--	+7.9
subtraction	--	-0.4	-0.4	--	--	-0.8
Subtotal	*+0.7*	*-0.4*	*+6.8*	*0.0*	--	*+7.1*
addition	0	--	+7.7	--	+6.7	+14.4
subtraction	--	-87.6	-2.0	-121.6	--	-211.2
Subtotal	*0*	*-87.6*	*+5.7*	*-121.6*	*+6.7*	*-196.8*
Total	**+0.7**	**-88.0**	**+12.5**	**-121.6**	**+6.7**	**-189.7**
PROPOSED FERC PROJECT BOUNDARY						
Private Lands	--	--	--	--	--	146.7
SSWD Lands	--	--	--	--	--	2,527.3
Total	--	--	--	--	--	**2,674.0**

Where SSWD proposes to add private lands to the FERC Project Boundary, SSWD has notified the land owner of this proposal.

Neither the existing FERC Project Boundary nor the Proposed FERC Project Boundary includes federal lands or tribal reservation lands.

6.0 List of Attachments

None.

7.0 References Cited

Northwest Hydraulic Consultants, Inc. (NHC) 2006. Probable Maximum Flood Study for Camp Far West Dam (FERC No. 2997). Prepared for South Sutter Water District.

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Application for New License
Major Project – Existing Dam

Exhibit B
Project Operations and Resource Utilization

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997

Prepared by:
South Sutter Water District
2464 Pacific Avenue
Trowbridge, CA 95659
www.sswd@hughes.net

June 2019

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List of Attachments

None.

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EXHIBIT B

PROJECT OPERATIONS AND RESOURCE UTILIZATION

1.0 Introduction

The South Sutter Water District (SSWD or Licensee) has prepared this Exhibit B, Project Operations and Resource Utilization, as part of its Application for a New License Major Project – Existing Dam – (Application for New License) from the Federal Energy Regulatory Commission (FERC or Commission) for the Camp Far West Hydroelectric Project, FERC Project No. 2997 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (traditional process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section 4.51(c), which described the contents of Exhibit B. This Exhibit B describes in detail, the manner in which SSWD operates the existing Project and plans to operate the Project as proposed in this Application for New License. As a reference, 18 C.F.R. Section 4.51(c) states:

> Exhibit B is a statement of Project operation and resource utilization. If the project includes more than one dam with associated facilities, the information must be provided separately for each such discrete development. The exhibit must contain:
>
> (1) A statement whether operation of the powerplant will be manual or automatic, an estimate of the annual plant factor, and a statement of how the project will be operated during adverse, mean, and high water years,
>
> (2) An estimate of the dependable capacity and average annual energy production in kilowatt-hours (or a mechanical equivalent), supported by the following data:
>
> (i) The minimum, mean, and maximum recorded flows in cubic feet per second of the stream or other body of water at the powerplant intake or point of diversion, with a specification of any adjustment made for evaporation, leakage, minimum flow releases (including duration of releases), or other reductions in available flow, monthly flow duration curves indicating the period of record and the gauging stations used in deriving the curves, and a specification of the period of critical stream flow used to determine the dependable capacity,
>
> (ii) An area-capacity curve showing the gross storage capacity and usable storage capacity of the impoundment, with a rule curve showing the proposed operation of the impoundment and how the usable storage capacity is to be utilized;
>
> (iii) The estimated minimum and maximum hydraulic capacity of the powerplant (maximum flow through the powerplant) in cubic feet per second;
>
> (iv) A tailwater rating curve; and
>
> (v) A curve showing powerplant capability versus head and specifying maximum, normal, and minimum heads.
>
> (3) A statement, with load curves and tabular data, if necessary, of the manner in which the power generated at the project is to be utilized, including the amount of power to be used on-site, if any, the amount of power to be sold, and the identity of any proposed purchasers; and

(4) A statement of the applicant's plans, if any, for future development of the project or of any other existing or proposed water power project on the stream or other body of water, indicating the approximate location and estimated installed capacity of the proposed developments.

In addition to this introductory section, this Exhibit B includes nine sections. Section 2 gives a general description of the Project. Section 3 describes the use of SSWD's Water Balance/ Operations Model in this exhibit. Section 4 describes hydrology in the Project Area.[1] Section 5 summarizes regulatory and contractual operating constraints of the Project. Section 6 describes existing Project operations. Section 7 describes SSWD's proposed Project operations. Section 8.0 describes the use of Project Power. Section 9 discloses SSWD's plans for future developments of the Project and water projects in the Bear River watershed. Section 10 includes a list of references cited.

See Exhibit A for a description of Project Facilities and features; Exhibit C for a construction history and a construction schedule; Exhibit D for a description of Project costs and financing; and Exhibit E for a discussion of potential environmental effects and SSWD's proposed resource management measures. Project design drawings and Project maps are included in Exhibits F and G, respectively. Exhibit H contains a detailed description of the need for the electricity provided by the Project, the availability of electrical energy alternatives and other miscellaneous information.

All elevation data in this exhibit is in United States Department of Commerce (USDOC), National Oceanic and Atmospheric Association (NOAA), National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

2.0 General Description of the Project

The existing Project consists of one development - Camp Far West – that, in total, includes: one main dam; one powerhouse with an associated switchyard with a capacity of 6.8 megawatts (MW); and appurtenant facilities and structures, including recreation facilities and gages.

The Project operates primarily to provide irrigation water to growers in SSWD's and the Camp Far West Irrigation District's (CFWID) service districts. However, SSWD also operates the Project to meet Bear River streamflow requirements and to generate power. SSWD has historically leased the power generating facilities to the Sacramento Municipal Utility District (SMUD), which has operated the Camp Far West Powerhouse and switchyard.

Camp Far West Reservoir does not have any dedicated flood control space or associated flood control rules, and the Project does not include any in-basin or out-of-basin water diversions, open water conduits, or transmission lines.

[1] In this exhibit, "Project Area" refers to the area within and immediately adjacent to the existing FERC Project Boundary, and the Bear River downstream of the Project.

In addition to providing power and downstream water supply, SSWD pumps water directly from the Camp Far West Reservoir to supply water to the Project recreation facilities' water treatment plant for Project recreation uses and to non-Project residences and buildings utilized by the concessionaire's year-round and seasonal staff. Pumping averages approximately 15.3 acre-feet (ac-ft) per year. This relatively small volume of pumping does not affect Project operations.

3.0 Use of SSWD's Water Balance/Operations Model in Exhibit B

SSWD has operated the Project since 1984. However, Project operations have changed through time. Therefore, historical operations information (e.g., flows, storage and generation) may not provide the best picture of current existing conditions. To describe better existing operations of Camp Far West Reservoir and associated hydropower and irrigation facilities over a range of hydrologic conditions, SSWD developed the Camp Far West Hydroelectric Project Water Balance/Operations Model (Ops Model).

The Ops Model is a tool to examine water supply and hydropower generation under a variety of hydrologic and operational conditions, and addresses operational decisions including: stream flow requirements, water supply, recreation, and hydropower generation. The Ops Model simulates operations subject to the physical constraints of the Project, including maximum and minimum reservoir elevations, reservoir outlet and powerhouse capacities, and the existing configuration of the Camp Far West Dam Spillway. Ops Model logic focuses on operations of Camp Far West Reservoir and the downstream non-Project diversion dam, which includes simulated diversions into SSWD's Main Canal and CFWID's North Canal and South Canal. Irrigation diversions are based on estimated agricultural demands, Camp Far West Reservoir storage and anticipated releases and diversions from upstream water storage projects. The Ops Model contains data for historical water transfers but does not include water transfers in its simulation of operations. The Ops Model also includes a representation of the Bear River downstream of the diversion dam to the confluence of the Bear River with the Feather River, including tributary inflow from Dry Creek at river mile (R.M.)[2] 5.1. Three additional stream nodes are located downstream of the diversion dam: Bear River at Wheatland; Bear River at Pleasant Grove Road; and the Bear River at the confluence with the Feather River. Table 3.0-1 provides a summary of output available from the Ops Model and Figure 3.0-1 is an overview of the Project, SSWD and CFWID service territories, and Ops Model nodes.

Table 3.0-1. Summary of Ops Model nodes and outputs.

Model Node	Model Output
NODES WITHIN PROJECT	
Camp Far West Reservoir	Storage and elevation
Camp Far West Powerhouse	Generation and release through turbine
Camp Far West Dam	Release from low-level outlet and spillway

[2] In this exhibit, river miles are estimated using SSWD's relicensing Geographic Information System (GIS) of the Bear River basin moving from downstream to upstream in the Bear River with R.M. 0.0 designating the confluence of the Bear River with the Feather River.

Table 3.0-1. (continued)

Model Node	Model Output
NODES DOWNSTREAM OF PROJECT	
CFWID North Canal	Diversion into canal
CFWID South Canal	Diversion into canal
SSWD Main Canal	Diversion into canal
Non-Project Diversion Dam	Estimated flow below diversion dam
Bear River at Wheatland	Estimated flow in river
Bear River at Pleasant Grove Road	Estimated flow in river
Bear River at Feather River	Estimated flow in river

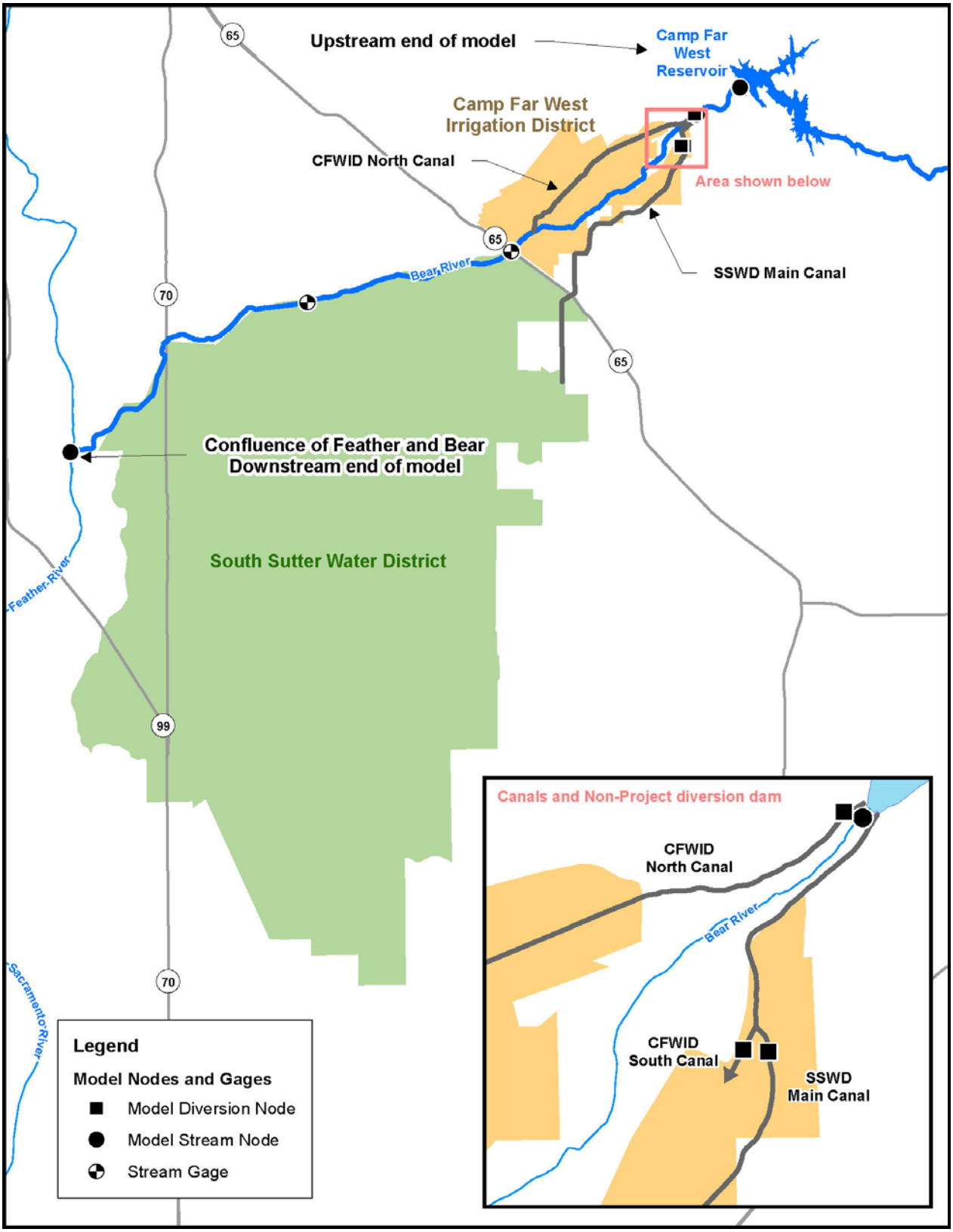

Figure 3.0-1. Camp Far West Hydroelectric Project, SSWD and CFWID service territories, and Ops Model nodes.

The Ops Model simulates operations on a daily time-step for 39 years of historical hydrology from Water Year (WY) 1976 through WY 2014. This period covers a range of hydrologic conditions and includes both the driest (1977) and wettest (1983) years on record, based on total annual inflow to Camp Far West Reservoir. The period also includes three multi-year periods of below average inflow: WYs 1976 through 1977; WYs 1987 through 1992; and WYs 2012 through 2014.

The Ops Model is a Microsoft Excel spreadsheet. SSWD selected Microsoft™ Excel as the Ops Model platform for several reasons including: availability to Relicensing Participants;[3] transparency of Ops Model logic and operations; flexibility in developing operational rules; and existing familiarity with spreadsheets for most Relicensing Participants. The Ops Model allows user-defined variables to be changed and different operations to be evaluated. Ops Model operational logic is transparent and editable.

The Ops Model includes preliminary WY types based on five WY types proposed for the upstream Nevada Irrigation District's (NID) Yuba-Bear Project (FERC Project No. 2266) and Pacific Gas and Electric's (PG&E) Drum-Spaulding Project (FERC Project No. 2310), collectively, the Yuba-Bear Drum Spaulding (YB/DS) Projects. The YB/DS Projects' WY types are used in the Ops Model for reporting model results and to evaluate potential operational decisions. The existing Project license includes only two WY types.

The Ops Model was developed and validated with inputs designed to represent historical operations and historical inflow.

Then, the Ops Model was used to develop a Baseline scenario, assuming YB/DS Projects near-term operations with assumed new YB/DS FERC license requirements based on the FERC-issued Final Environmental Impact Statement (FEIS) for both projects and the current level of development upstream. The YB/DS Projects are currently in the process of relicensing. Therefore, upstream operations are expected to change in the near future and those changes will affect inflow into Camp Far West Reservoir and SSWD's operations. Inflow into Camp Far West was provided by HDR Inc., a consultant to NID and PG&E for the YB/DS relicensing, based on a model of the YB/DS Projects. The Baseline scenario includes Camp Far West operations representative of how SSWD currently operates the Project, and includes all current physical, regulatory, and contractual constraints.

The Ops Model was then used to develop two separate Proposed Project simulations. The first scenario, Proposed Project (Near-Term Condition), assumes YB/DS Projects operations with assumed new YB/DS FERC license requirements based on the FERC-FEIS for both projects, the current level of development upstream, and SSWD's Proposed Project. The second scenario, (Future Condition), assumes YB/DS Projects operations with assumed new FERC license requirements, a future level of development upstream, and SSWD's Proposed Project.

[3] In this exhibit, "Relicensing Participants" includes SSWD, federal and State agencies, local agencies, non-governmental organizations (NGO), businesses and members of the public that routinely and actively take part (i.e., attend meetings/workshops and make filings) in the Camp Far West Project relicensing.

Inflow hydrology for Dry Creek was developed as part of SSWD's relicensing Study 2.2 *Water Temperature Modeling*, by gage reconstruction. Dry Creek was gaged from WY 1947 to 1962, capturing 87 percent (99.9 square miles, or sq mi) of the total Dry Creek drainage basin. The analysis was a flow gage reconstruction for the desired WYs (1976 through 2014), and not an estimate of the total Dry Creek flow at the Bear River. Statistical regression relationships were developed to relate the Dry Creek gage to other flow gages in Northern California as summarized in Table 3.0-2. Due to the lack of overlapping periods of record, regressions of Laguna Creek near Elk Grove and Dry Creek near Roseville to South Honcut Creek were developed to first synthesize South Honcut Creek, which is then used to synthesize Dry Creek near Wheatland. The resulting time series was used for both the Near-Term and Future Conditions scenarios.

Table 3.0-2. Flow gages used in analysis.

Flow Gage	Gage Identification	WYs Available	Mean Elevation (ft)	Watershed Area (mi^2)	Dry Creek Synthesis Periods
Dry Creek near Wheatland	11424500	1947-1962	920	99.9	--
South Honcut Creek near Bangor	11407500, *A05775*	1951-1986, *2006-2014*	1640	30.6	1975-1986
Dry Creek near Roseville	11447293	2000-2012	450	80.1	2000-2005
Laguna Creek near Elk Grove	11336585	1996-2014	120	31.9	1996-1999
Napa River near St. Helena	11456000	1947-1995, 2000-2014	1020	78.8	1987-1995

Note: Italicized data from DWR Water Data Library, all other data from USGS.

The Ops Model was validated by comparison with observed data from WY 1995 through WY 2014. Recent years are used for validation because SSWD operations have changed during the 39-year simulation period, most notably in 2000. For this reason, a separate simulation was used for model validation. The validation model also includes limited water transfers that occurred during the validation period.

The Ops Model Validation Report and the Ops Model itself is included in Appendix E1 of Exhibit E.

4.0 Hydrology

4.1 Relicensing Hydrology Datasets

SSWD developed six hydrology datasets (mean daily values for flows and daily values for reservoir elevation and storage) to support the Camp Far West Project relicensing. These datasets are:

1. Historical Hydrology. This dataset is composed of publicly available, empirical, gaged reservoir and flow data in the Project Area, and covers the period from WY 1928 through WY 2014. The WY 1928 through 1964 period covers the period prior to the

development of Camp Far West Dam;[4] the WY 1967 through 1984 covers the period from when the dam was in place but prior to the development of Camp Far West Powerhouse; and the WY 1985 through 2014 period covers the period from when both the dam and powerhouse were in place. The Ops Model includes calculated, historical inflow to Camp Far Water Reservoir based on historical gage records for the modeling period of record, which is from WY 1976 through WY 2014.

2. Unimpaired Hydrology. This dataset is an estimation of flows that would have occurred in the basin during the modeling period of record if no Project or non-Project facilities were present.[5]

3. Environmental Baseline. This dataset is the No Action Alternative, and is an estimation of inflow to Camp Far West Reservoir, operations, and flows that would have occurred in the basin during the modeling period of record if the Project and all non-Project facilities were present and operating under expected, near-term conditions. This dataset is used throughout SSWD's Application for New License to represent environmental baseline reservoir and flow conditions. SSWD uses this dataset instead of the Historical Hydrology dataset to represent near-term environmental baseline conditions because using historical data would be misleading given changes in Project and non-Project operations over time. This hydrology dataset is a product of the Ops Model, and is sometimes referred to in this Application for New License as the No Action Alternative. Near-Term Conditions assume YB/DS Project operations with assumed new FERC license requirements based on the FERC-issued FEIS for both YB-DS Projects and the current level of development upstream.

4. Proposed Project (Near-Term Condition). This dataset is SSWD's proposed Project under near-term conditions. Near-Term conditions assume YB/DS Project YB/DS Projects operations with assumed new FERC license requirements based on the FERC-issued FEIS for both YB-DS Projects and the current level of development upstream.

5. Proposed Project (Future Condition). This dataset is SSWD's proposed Project under future conditions. Future conditions assume YB/DS Project operations with assumed new FERC license requirements based on the FERC-issued FEIS for both YB-DS Projects and the future (WY 2062) level of development upstream.

Each hydrology dataset as well as SSWD's methods used to estimate each flow condition are provided in Appendix E1 of Exhibit E of SSWD's Application for New License. Specifically, for the modeling period of record the attachment includes: 1) mean daily releases from the Project powerhouse; 2) total mean daily flow below Camp Far West Dam (i.e., the sum of the powerhouse discharge, dam spill and low-level outlet release); 3) mean daily fish release flow immediately downstream of the non-Project diversion dam, the flow compliance location in the existing Project license; 4) daily Camp Far West Reservoir water surface elevation (WSE) and

[4] This period starts after the first Camp Far West Dam, which was a 50-ft high concrete gravity structure was built by the CFWID in 1927. The dam was enlarged in 1964 by SSWD as part of the California State Water Plan to enhance water supply in California's Central Valley. Camp Far West Dam and Reservoir are not part of California's State Water Project.

[5] Unlike other tributaries to the Feather River, the California Department of Water Resources (DWR) does not forecast or estimate unimpaired flow in the Bear River.

storage; and 5) other hydrologic information. Data are provided in the United States Army Corps of Engineers' (USACE) Hydrologic Engineering Center's (HEC) Data Storage System (DSS) format and in Microsoft™ Excel format, and monthly duration curves are provided for flow.

4.2 Overview of the Bear River Hydrology

The Project is located in the Bear River Basin, which drains approximately 400 square miles (sq mi) of the western slope of the Sierra Nevada, including portions of Yuba, Nevada, Sutter, and Placer counties. The Bear River is a tributary of the Feather River, which in turn is a tributary of the Sacramento River. The Bear River originates near Emigrant Gap in Nevada County at an elevation of approximately 4,900 ft and flows southwesterly for approximately 75 mi to its confluence with the Feather River northeast of the town of East Nicolaus, CA, at an elevation of about 50 ft. The average annual flow of the Bear River from WY 1976 through WY 2014, the Ops Model's period of record, as measured at the USGS Gage 11424000, *Bear River at Wheatland* (river mile (RM)[6] 11.5) is 376 cfs, and the annual flow has ranged from a maximum of approximately 1,191 cfs in WY 1983 to a minimum of approximately 3 cfs in WY 1977.

Upstream of Camp Far West Reservoir at RM 74.5, PG&E's Drum-Spaulding Project Drum Canal can add up to 840 cfs of water to the natural flow in the Bear River at PG&E's Drum Forebay, which is at an elevation of 4,756 ft and has a gross storage capacity of 621 ac-ft. Other small impoundments in the Bear River upstream of the Project include PG&E's Drum Afterbay at RM 65.9, which is at an elevation of 3,383 ft, and NID's Dutch Flat Afterbay at RM 60.5, which is at an elevation of 2,740 ft and has a gross storage capacity of 1,397 ac-ft. Major storage reservoirs in the Bear River occur at RM 50.4 (NID's Rollins Reservoir at an elevation of 2,171 ft with a gross storage capacity of 58,682 ac-ft) and at RM 37.2 (NID's Lake Combie at an elevation of 1,600 ft with a gross storage capacity of 5,555 ac-ft). Out-of-basin diversions occur at RM 50.3 (PG&E's Bear River Canal with a maximum capacity of 470 cfs) and at RM 37.2 (NID's Combie Phase I Canal with a maximum diversion of 200 cfs).

From Camp Far West Dam, the Bear River flows southwest 1.3 mi to a 38-ft high non-Project diversion dam where up to 475 cfs of Bear River water is diverted into SSWD's Main Canal. Approximately 40 cfs of that water is re-diverted from the first 0.5-mi of the canal to the CFWID South Canal, with the remaining water going down the Main Canal to SSWD's customers. In addition, up to 35 cfs of Bear River water is diverted at the non-Project diversion dam into the CFWID North Canal. The Project does not include any in-basin or out-of-basin diversions.

Figure 4.2-1 shows the locations of these non-Project Facilities.

[6] For the purpose of this exhibit, river miles, or RM, refer to the river mile in the Bear River from downstream to upstream with Bear River confluence with the Feather River being RM 0.0.

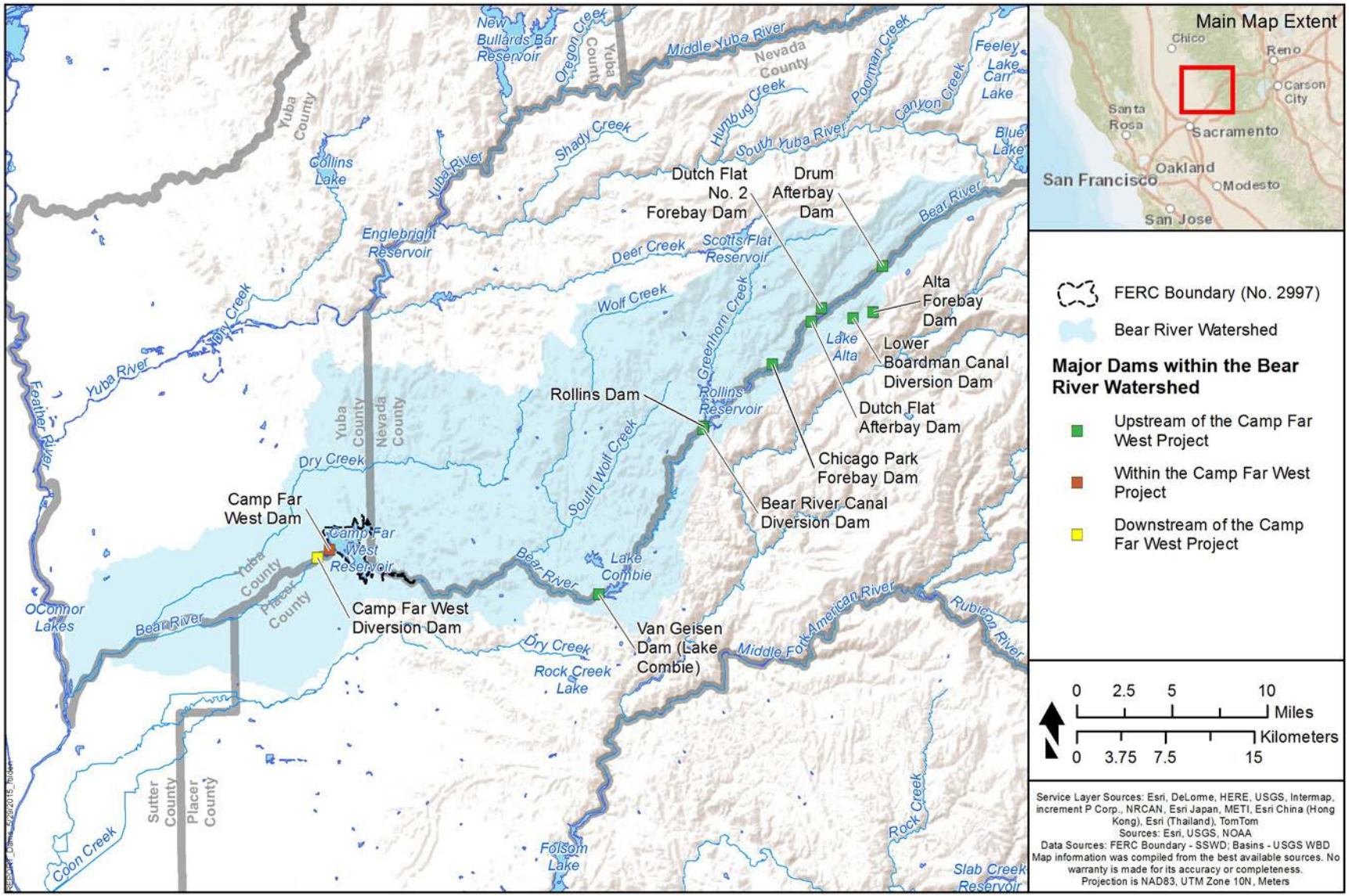

Figure 4.2-1. General location of dams within the Bear River watershed.

4.3 Climate

The Project Region experiences hot, dry summers and cool winters with substantial rainfall, but no appreciable snowfall. The National Weather Service monitoring station Number 045385 at Marysville, at an elevation of approximately 75 ft, provides a climate history representative of the Project Region. These areas occupy the eastern Central Valley and rolling, western Sierra foothills, and can experience high summer temperatures, mostly unmitigated by the "Delta breezes" that are present further south and west in California's Central Valley. July air temperatures at Marysville, California, average a high of 96.3 degrees Fahrenheit (°F), and a low of 61.3°F. January average high and low temperatures are 54.1°F and 37.7°F, respectively. Annual average precipitation totals 20.96 inches (in.), and falls exclusively as rain, with 68 percent falling during the winter months from December through March. June through August total precipitation averages only 0.31-in., generally resulting from rare summer thunderstorms (WRCC 2018).

4.4 Streamflow and Reservoir Stage Gages in the Project Area

Publicly available flow and reservoir elevation and storage data for the Project Vicinity[7] come from USGS and CDEC gages within the Bear River basin. Table 4.4-1 includes these gages, as well as several additional gages maintained by SSWD or SMUD for operation and maintenance purposes. In addition, SSWD maintains several additional non-Project seasonal flow gages for water rights compliance.

Table 4.4-1. Streamflow gages, Project release and reservoir gages.

USGS/CDEC Gage Number	Name	Elevation (ft)	Drainage (sq mi)	Period of Record	
				Start	End
STREAMFLOW GAGES					
--	Bear River above Camp Far West Reservoir[1]	325	NA	Seasonal	
11423800[2]	Bear River Fish Release below Camp Far West Reservoir, near Wheatland, CA	120	286	10/1/1989	Present
11424000[3]	Bear River near Wheatland, CA	72	292	10/23/1928	Present
11424500[4]	Dry Creek near Wheatland, CA	63	100	4/21/2006	Present
BPG	Bear River near Pleasant Grove, CA	65	NA	1/27/2006	Present
PROJECT RELEASE GAGES					
--	Camp Far West Dam Low-Level Outlet Flowmeter	140	286	1/1/1968	Present
--	Camp Far West Powerhouse Flowmeter	140	286	1/1/1985	Present
RESERVOIR STORAGE GAGES					
11423700	Camp Far West Reservoir near Wheatland, CA	N/A	283	10/1/1966	9/30/1983
CFW	Bear River at Camp Far West Dam	260	286	8/21/1997	Present

Notes: Elevation and drainage per USGS/CDEC records.
NA: Not available

[1] Gage data are unavailable.

[2] Gage is used by SSWD to document compliance with the minimum instream flow requirements in the existing FERC license. The gage has a CDEC designation (CFW) but the data are not available on CDEC.

[3] Also reported as CDEC Gage "BRW" since January 24, 1997.

[4] Existing gage reports stage data. Historical gage reported discharge over the period from October 1, 1946, through September 29, 1962.

[7] In this exhibit, "Project Vicinity" refers to the area surrounding the Project on the order of United States Geological Survey (USGS) 1:24,000-scale topographic quadrangle.

Figure 4.4-1 provides a schematic view of Project Facilities and gages in the Project Vicinity.

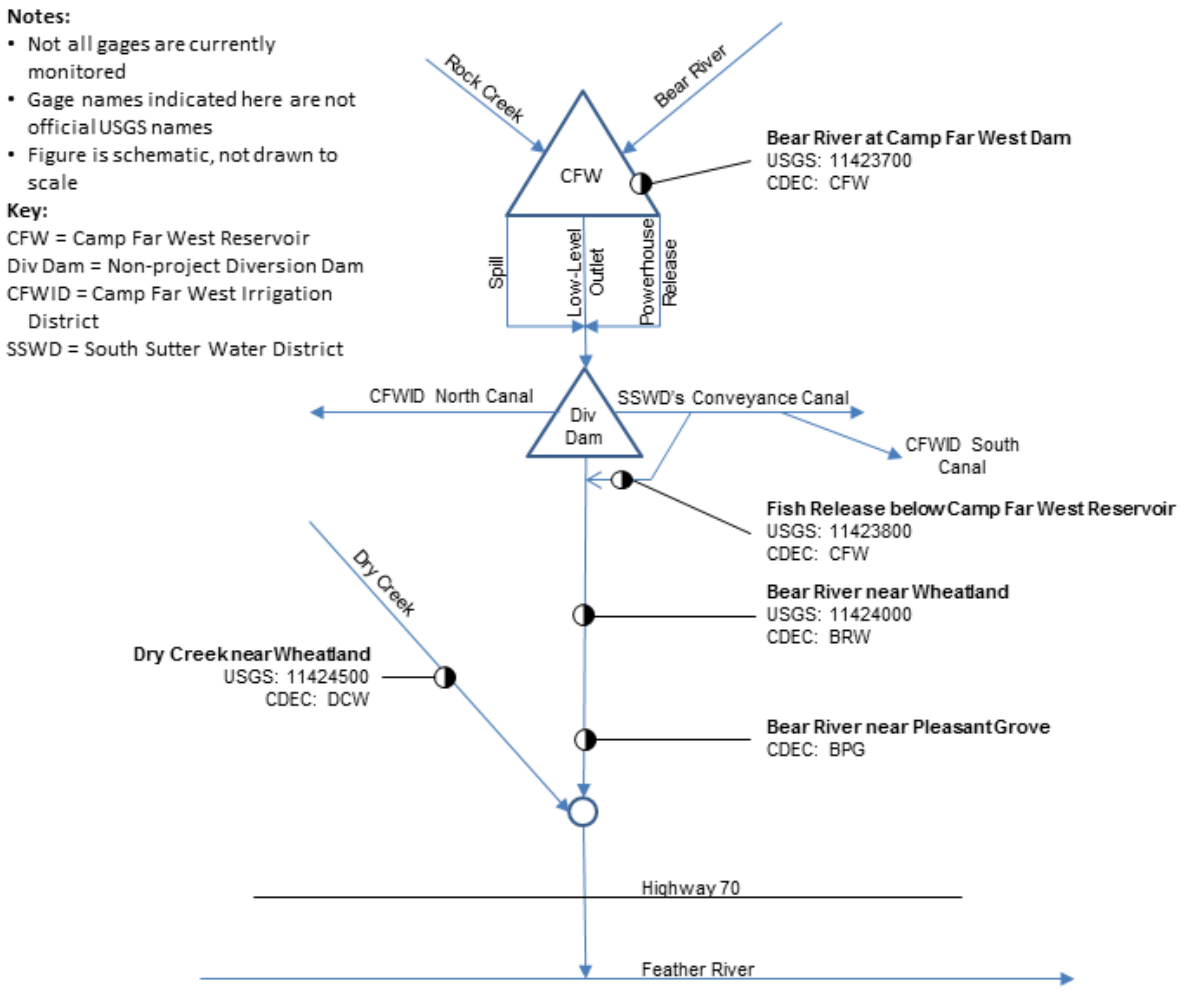

Figure 4.4-1. Schematic of the Project Vicinity, including public gage identification numbers.[8]

5.0 Regulatory/Contractual Operating Constraints

This section discusses operating constraints, including conditions in the existing FERC license, measures in other existing licenses, agreements and contracts that affect Project operations.

5.1 Conditions in Current FERC License

The initial license included 33 articles numbered 1 through 33, which have not changed since the license was issued. Of these, SSWD considers six articles (i.e., articles 24, 25, 26, 27, 28 and

[8] SSWD also collects flow data for the Bear River above Camp Far West Reservoir, Camp Far West dam low-level outlet, CFWID North Canal and the SSWD Conveyance Canal. SMUD also collects flow data for the Camp Far West Powerhouse. These data are not available to the public.

32) "expired" or "out of date," because each pertains to a construction activity that has been completed, a filing related to a construction activity that has been completed, or another activity that has been completed. As a result, the existing license contains 27 "active" articles. The general topic that each of the 27 active articles is provided in Table 5.1-1.

Table 5.1-1. List of active requirements in the existing FERC license for the Camp Far West Hydroelectric Project.

Article(s)	Description	Article(s)	Description
1	General - Compliance	15	Construction of fish and wildlife protective devices and structures by Licensee
2 & 3	FERC approval of changes	16	Construction of fish handling facilities by U.S.
4	FERC inspection and supervision	17	Recreation facilities
5	Obtain any needed land rights	18	Allow public access to Project lands and waters
6	Federal takeover	19	Soil erosion and sedimentation control
7	Project costs and depreciation	20	Clearing
8	Gaging and stream gaging	21	Implied surrender provisions
9	Install additional capacity if order by FERC	22	Termination of license
10	Coordinate with others if ordered by FERC	23	Terms and conditions of FPA
11	Headwater benefits	29	Minimum flows
12	Operation as ordered by FERC to protect life, health property or for other benefits	30	Consult with resource agencies on impacts to fish and wildlife during construction and operation of project.
13	Non-project use of project lands	31	Annual Charges
14	Public safety related to safety of transmission lines, telephone lines, etc.	33	Standard Land Use Article

Of these, Article 29 is more germane to Project operations than the other 26 articles. Provided below as Article 29 as it appears in the existing FERC License.

> **Article 29.** The licensee shall maintain a continuous minimum flow of 25 cfs from April 1 through June 30 and 10 cfs from July 1 through March 31 or inflow to the project reservoir, whichever is less, as measured immediately below the Camp Far West diversion dam to protect and enhance the fishery resources in Bear Creek. The flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods for fishery management purposes, upon mutual agreement between the licensee and the California Department of Fish and Game. Gaging facilities shall be constructed according to the recommendations of the Geological Survey and shall be operational by April 15, 1989.[9]

[9] Article 29 in the initial license was amended in 46 FERC ¶62,088, Order Amending License, issued by FERC on January 26, 1989 to read as shown above.

5.2 Measures in Other Existing Licenses, Agreements and Contracts that Affect Project Operations

5.2.1 SSWD's Water Rights for Power (No Expiration Date)

SSWD holds a post-1914 appropriative water right for the purposes of operating the Project for hydroelectric power generation. Table 5.2-1 provides SWRCB designations and the key terms of the post-1914 appropriative water-right permit held by SSWD for power use.

Table 5.2-1. Water right permit held by SSWD for operation of the Camp Far West Hydroelectric Project for power generation.[1]

Priority (date)	SWRCB Designation (application)	SWRCB Designation (permit)	SWRCB Designation (license)	Source (Waterbody)	Rate, Amount & Season	Point of Diversion (powerhouse)
1/4/80	26162	18360	Not Issued Yet	Bear River	725 cfs Direct Diversion from 1/1 – 12/31	Camp Far West Dam Powerhouse
					103,100 ac-ft Storage from 10/1 – 6/30	

[1] SSWD's water rights include a Bay-Delta flow component as described in Section 5.2.3.

For the protection of fish and wildlife, SSWD's Permit 18360 identifies a minimum required release of 25 cfs during April 1 through June 30 and 10 cfs from July 1 through March 31. If the total inflow to Camp Far West Reservoir is less than the designated amount for a given period, SSWD shall bypass that quantity.

The time to complete beneficial use for Permit 18360 expired on December 1, 1995. SSWD submitted a request for licensing of Permit 18360 to the SWRCB Division of Water Rights on September 9, 1997, which is still pending.

SSWD operates the Project consistent with the terms and conditions of the above water right.

5.2.2 Water Supply Deliveries from the Bear River to SSWD's Service Area (No Expiration Date)

SSWD makes water deliveries from the Bear River and several small tributaries to its members within its service area consistent with SSWD's consumptive use water rights. Table 5.2.-2 lists SSWD's post-1914 appropriative water-right licenses and permit for irrigation and domestic uses.

Table 5.2-2. Water rights held by SSWD for delivery to SSWD's members within its service area for irrigation and domestic uses.

Priority (date)	SWRCB Designation (application)	SWRCB Designation (license)	Source (Waterbody)	Purpose of Use	Rate & Amount	Season (period)	Place of Beneficial Use
6/13/41	10221	11120	Bear River	Irrigation, Domestic and Incidental Power [2]	250 cfs Direct Diversion	from 3/1 – 6/30 and from 9/1 – 10/31	59,000 ac within SSWD and 4,180 ac within CFWID
					40,000 ac-ft Storage	from 10/1 – 6/30	

Table 5.2-2. (continued)

Priority (date)	SWRCB Designation (application)	SWRCB Designation (license)	Source (Waterbody)	Purpose of Use	Rate & Amount	Season (period)	Place of Beneficial Use
5/12/52[1]	14804	11118	Bear River	Irrigation, Domestic and Incidental Power	330 cfs Direct Diversion	from 5/1 – 9/1	59,000 ac within SSWD and 4,180 ac within CFWID
					58,370 ac-ft Storage	from 10/1 – 6/30	
8/16/51	14430	4653	Coon Creek	Irrigation	2 cfs Direct Diversion	from about 4/1 – about 11/1	80 ac
4/12/65	22102	11121	East Side Canal, Coon Creek, Markham Ravine, and Auburn Ravine	Irrigation	40.3 cfs Direct Diversion 4,769 ac-ft per annum	from 4/1 – 6/15 and 9/1 – 10/31	4,000 ac
8/11/71	23838	12587	Yankee Slough	Irrigation	1.35 cfs Direct Diversion 143 ac-ft per annum	from 4/1 – 6/30 and 9/1 – 9/30	235 ac

[1] SSWD received a release from priority from Applications 5633 and 5634 for Application 14804.
[2] Incidental Power is identified as a purpose of use for Applications 10221 and 14804. The powerhouse listed in the place of use for these applications is a hydroelectric facility located along SSWD's main canal.

SSWD delivers this water from the Bear River via its Main Canal, which is located on the Bear River about 1.2 mi downstream of Camp Far West Dam.

Identical to the required fish release for SSWD's power permit, Applications 10221 and 14804 identify minimum required releases of 25 cfs during April 1 through June 30 and 10 cfs from July 1 through March 31. If the total inflow to Camp Far West Reservoir is less than the designated amount for a given period, SSWD shall bypass that quantity. These required fish releases are not additive.

5.2.3 Bay-Delta Bear River Voluntary Agreement (Expires December 31, 2035)

In February 2000, after prolonged negotiations, SSWD, DWR and the CFWID entered into the Bear River Settlement Agreement (DWR, SSWD and CFWID 2000) with the objective of settling the responsibilities of SSWD, CFWID, and all other Bear River water rights, to implement the standards in the SWRCB's May 22, 1995 *Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary*.

To incorporate this settlement agreement into SSWD's water rights, in July 2000, the SWRCB issued Order 2000-10 that amended SSWD's Water Right Licenses 11120 and 11118 to provide that:

> During releases of water in connection with the change of purpose of use and place of use of up to 4,400 acre-feet transferred to DWR during dry and critical years,[10] Licensee shall increase flows in the lower Bear River

[10] The Bear River Settlement Agreement and SWRCB Order 2000-10 state: *"Dry and critical years are defined, for purposes of this order, as set forth on page 23 of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin*

> by no more than 37 cfs from July through September. To avoid stranding impacts to anadromous fish in the Bear River below Camp Far West Reservoir, Licensee shall, by the end of a release period from the reservoir in connection with said change, ramp down flows from the reservoir at a rate not to exceed 25 cfs over a 24-hour period.

The required flow volume is in addition to the minimum flow requirement in the Project license, and is measured immediately downstream of the diversion dam as spill over the diversion dam (i.e., SSWD installs notched boards on the diversion dam and controls the elevation of the diversion dam impoundment to provide the required flow).

As shown in Table 5.2-3, SSWD has met the requirements in the Bear River Settlement Agreement and in its amended water rights in each "Dry" and "Critically Dry Year", as defined in the agreement. Transfers are not required in non-"Dry" and "Critically Dry" years. In each transfer year, DWR compensated SSWD for the amount of water transferred.

Table 5.2-3. Years in which SSWD has met the requirements in the Bear River Settlement Agreement and in its amended water rights.

Year	Was Year "Dry" or "Critically Dry" Based on the Bear River Settlement Agreement[1]	Amount of Water Transferred to DWR in "Dry" and Critically Dry" Years in Accordance with the Bear River Settlement Agreement[2]
2000	No	Transfer Not Required
2001	Yes	4,137
2002	Yes	3,882
2003	No	Transfer Not Required
2004	No	Transfer Not Required
2005	No	Transfer Not Required
2006	No	Transfer Not Required
2007	Yes	4,644
2008	Yes	4,425
2009	Yes	4,423
2010	No	Transfer Not Required
2011	No	Transfer Not Required
2012	No	Transfer Not Required
2013	Yes	4,402
2014	Yes	4,400
2015	Yes	4,471
2016	No	Transfer Not Required
2017	No	Transfer Not Required
2018	No	Transfer Not Required

[1] The SSWD/SWRCB/DWR Bear River Settlement Agreement and SSWD's amended water rights define "Dry" and "Critically Dry" years as determined by the Sacramento Valley 40-30-30 Index.

[2] The SSWD/SWRCB/DWR Bear River Settlement Agreement and SSWD's amended water rights stipulate that SSWD will transfer up to 4,400 ac-ft of water to DWR in "Dry" and "Critically Dry" years, and DWR will compensate SSWD for the volume of the transfer at an agreed upon cost per ac-ft.

SWRCB's Order 2000-10 states that this arrangement would terminate upon the termination of the Bear River Settlement Agreement on December 31, 2035, or sooner if the agreement was terminated sooner.

Delta Estuary (Adopted by the SWRCB in May, 1995), except that such years do not include a year in which water storage in Camp Far West Reservoir on April 1 is at or below 33,255 acre-feet ("extreme critical year")."

5.2.4 Water Supply Contracts (No Expiration Date)

SSWD and CFWID entered into an Agreement in 1957 and a Supplemental Agreement in 1973, relative to the construction and subsequent enlargement of Camp Far West Reservoir. Under the Agreement, SSWD provides CFWID 13,000 ac-ft of water from the Reservoir each year to satisfy CFWID's senior water rights along the Bear River.

5.2.5 Water Transfers

In recent years, SSWD has participated in water transfers of water held in storage in Camp Far West Reservoir. Transfers have occurred in 2008, 2009, 2010, 2014, 2015, and 2018. Table 5.2-4 summarizes the approximate volumes of water released for transfer in each of these years. In each year, transfer water was released from Camp Far West Dam in the months of July, August, and September. Transfer water flowed over the non-Project diversion dam and down the Bear River, was conveyed across the Sacramento-San Joaquin River Delta, and was subsequently pumped out of the southern Delta at facilities owned and operated by the State Water Project (SWP) or the Central Valley Project (CVP). The decision on whether to participate in voluntary water transfers is made each year, when there are potential buyers, by the SSWD Board of Directors. It is unknown whether SSWD will participate in future water transfers.

Table 5.2-4. Annual SSWD water transfers in recent years.

Water Year	Total Volume Released for Transfer (ac-ft)
2008	7,100
2009	10,000
2010	10,000
2014	10,000
2015	6,000
2018	10,590

5.2.6 SMUD Power Purchase Contract (Expires July 1, 2031)

In August 1991, SSWD and SMUD entered into a Contract for the Sale and Purchase of Electricity of the power generated at the Camp Far West Powerhouse. Under the contract, SMUD reimburses SSWD for the construction of the Camp Far West Powerhouse and associated power facilities, SMUD operates the powerhouse under a lease, and SMUD receives all the power from the powerhouse by paying for the power at a fixed rate. The contract expires on July 1, 2031.

SMUD receives Renewable Energy Credits for power generated at Camp Far West Powerhouse through the California Energy Commission. The powerhouse is registered under California Energy Commission Plant ID H0083.

6.0 Existing Operations (Environmental Baseline)

This section discusses Project operations under the No Action Alternative (i.e., environmental baseline) in typical dry, normal and wet years; by Project facility; and in the Bear River downstream of the Project.

6.1 Operations in Typical Dry, Normal and Wet Years

FERC regulations require that an applicant describe Project operation in typical adverse (dry), mean (normal) and high (wet) years. SSWD selected 1995, 2003, and 2001 as representative Wet, Normal, and Dry WYs, respectively, because these years approximate the 10, 50, and 90 percent exceedance intervals, respectively, for annual flow volume as measured at USGS Gage 11424000, *Bear River near Wheatland*. This gage was selected because it is the nearest full-flow gage to Camp Far West Dam. Figures 6.1-1 through 6.1-3 show for each representative WY: 1) observed daily water storage in Camp Far West Reservoir based on existing reservoir storage curves; 2) observed mean daily water releases from Camp Far West Dam and Powerhouse (i.e., releases through the powerhouse, low-level outlet and over the spillway); and 3) mean daily flows at USGS Gage 11424000 located about 6.5 mi downstream from Camp Far West Dam near Wheatland.

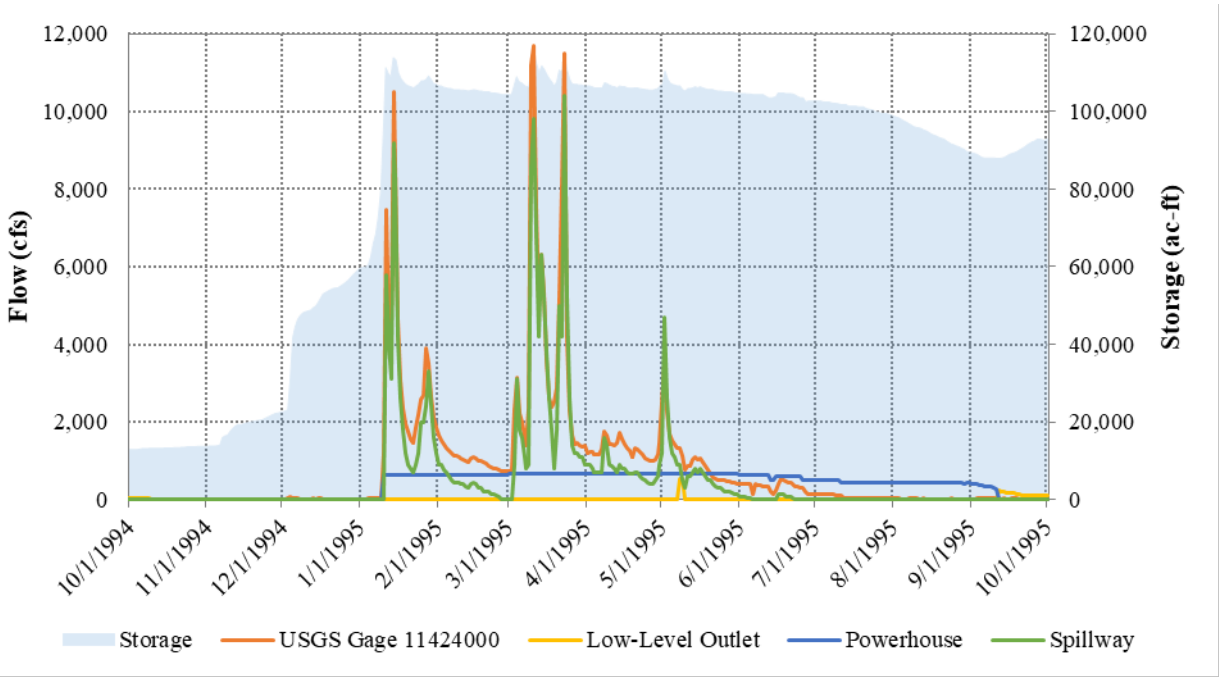

Figure 6.1-1. Camp Far West Hydroelectric Project releases and storage in a representative Wet Water Year – 1995 (Historical Hydrology).

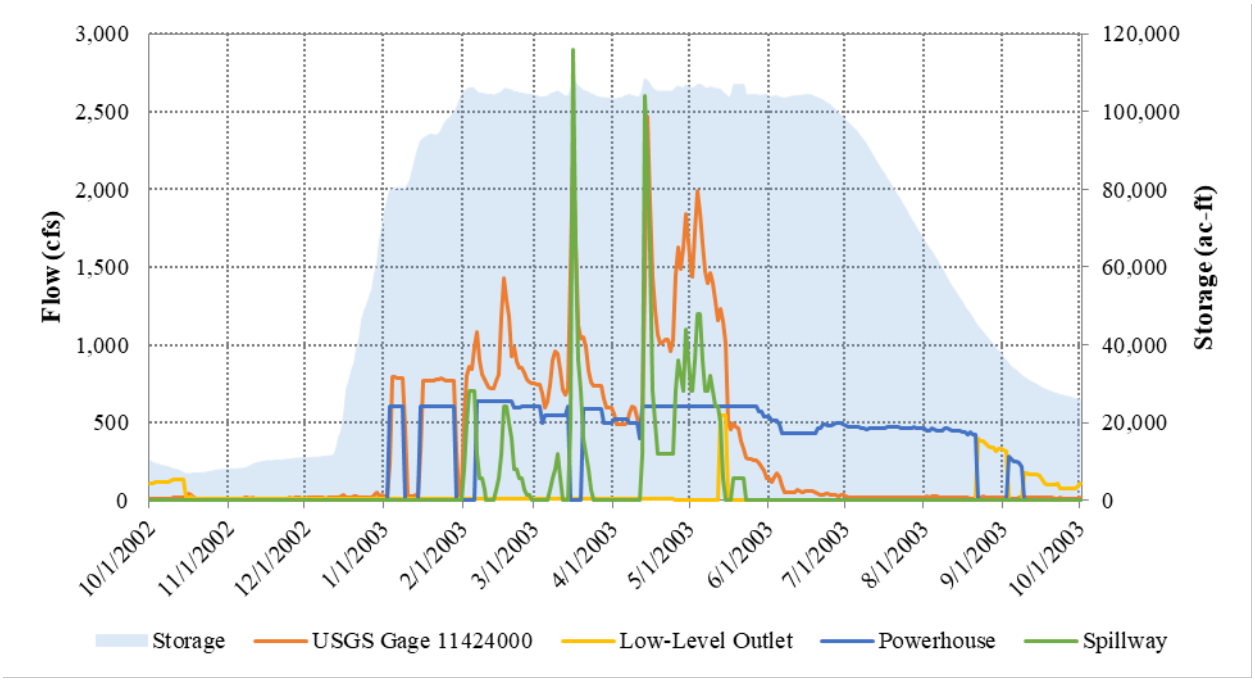

Figure 6.1-2. Camp Far West Hydroelectric Project releases and storage in a representative Normal Water Year – 2003 (Historical Hydrology).

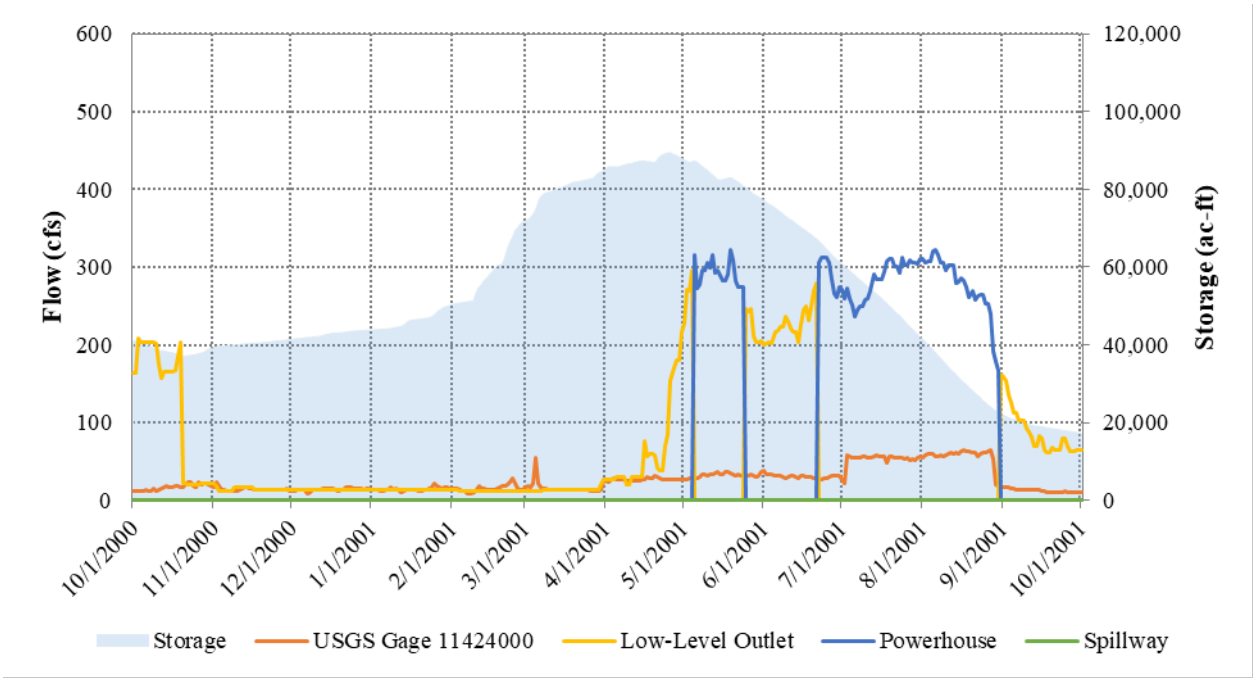

Figure 6.1-3. Camp Far West Hydroelectric Project releases and storage in a representative Dry Water Year – 2001 (Historical Hydrology).

6.2 Operations by Project Facility

This section describes reservoir operations of Camp Far West Reservoir, including water supply delivery to SSWD, reservoir carryover storage, and Project energy generation. Table 6.2-1 includes a summary of average annual results by YB/DS WY type from the Ops Model for the No Action Alternative.

Table 6.2-1. Average annual results for Project by WY type from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition).

Water Year Type[1]	SSWD Diversions for Water Supply (ac-ft)	Camp Far West Reservoir Carryover Storage[2] (ac-ft)	Peak Project Energy Generation (MWhr)	Off-Peak Project Energy Generation (MWhr)	Total Project Energy Generation (MWhr)	Mean Flow Downstream of Non-Project Diversion Dam (cfs)
Wet	109,600	39,700	14,375	22,780	37,155	826
Above Normal	109,000	23,600	11,722	18,584	30,306	365
Below Normal	100,500	14,500	8,321	13,164	21,485	178
Dry	53,700	13,000	2,138	3,378	5,515	42
Critical	19,200	5,400	412	650	1,062	15
All	**82,900**	**20,800**	**7,888**	**12,493**	**20,381**	**309**

[1] For this summary, SSWD used the WY types in FERC's FEIS for the YB/DS Projects solely to classify years.

[2] Carryover storage is reservoir storage on October 31, carried over into the following year.

6.2.1 Camp Far West Reservoir

Camp Far West Reservoir is the storage facility for the Project. The reservoir has a gross storage capacity of 93,737 ac-ft (i.e., storage at the Normal Maximum Water Surface Elevation [NMWSE] of 300 ft) and no regulatory minimum pool.

The reservoir's usable capacity is 91,237 ac-ft, which is the volume of water in the reservoir between the NMWSE and the reservoir's operational deadpool level, which is at storage level 2,500 ac-ft.

Releases from Camp Far West Reservoir are made through: 1) the Camp Far West Power Intake to Camp Far West Powerhouse at the base of the dam; 2) the dam's Low-Level Intake to the 48-in. diameter Howell-Bunger outlet valve at the base of the dam; and 3) through the ungated spillway.

One of SSWD's major considerations each year is anticipated water availability. SSWD begins estimating water availability each year in January and continually updates the estimate throughout the spring runoff period. When estimating available water supply, SSWD considers current Camp Far West Reservoir storage and estimates of upstream storage and water releases. These estimates of water availability are then compared to SSWD's estimates of water needs, including required releases to meet minimum flow requirements and for consumptive water deliveries.

Although the specific water availability can vary widely, normal Project operation is to fill Camp Far West Reservoir as early in the season as sufficient water becomes available and to then spill

the excess flows over the Camp Far West Dam ungated spillway. Because the reservoir is fed primarily by rainfall-produced runoff and releases from upstream water projects, it is difficult to predict the amount of inflow anticipated before the end of the season; therefore, SSWD retains within the reservoir, all of the inflow except releases for requirements for fisheries until the beginning of the irrigation season. Since the reservoir is operated as a fill-and-spill system, its effect on downstream flood flows is erratic, as it may range from complete control to only minor surcharge regulation.

Generally, Camp Far West Reservoir fills in winter and spring by catching rainfall and snowmelt runoff and is drawn down in the summer and fall to meet minimum flow requirements and water delivery demands. Water is released from Camp Far West Reservoir from mid-April to mid-October for water supply deliveries. Water is diverted at the non-Project diversion dam located immediately downstream of Camp Far West Dam. Starting in 2001, water was transferred in dry and critical years according to the Bay-Delta Bear River Settlement Agreement, as discussed in Section 5.2.3.

Figure 6.2-1 shows modeled daily storage in Camp Far West Reservoir, as well as the maximum-daily storage and minimum-daily storage for the period of record, and various percent exceedance levels of daily storage.

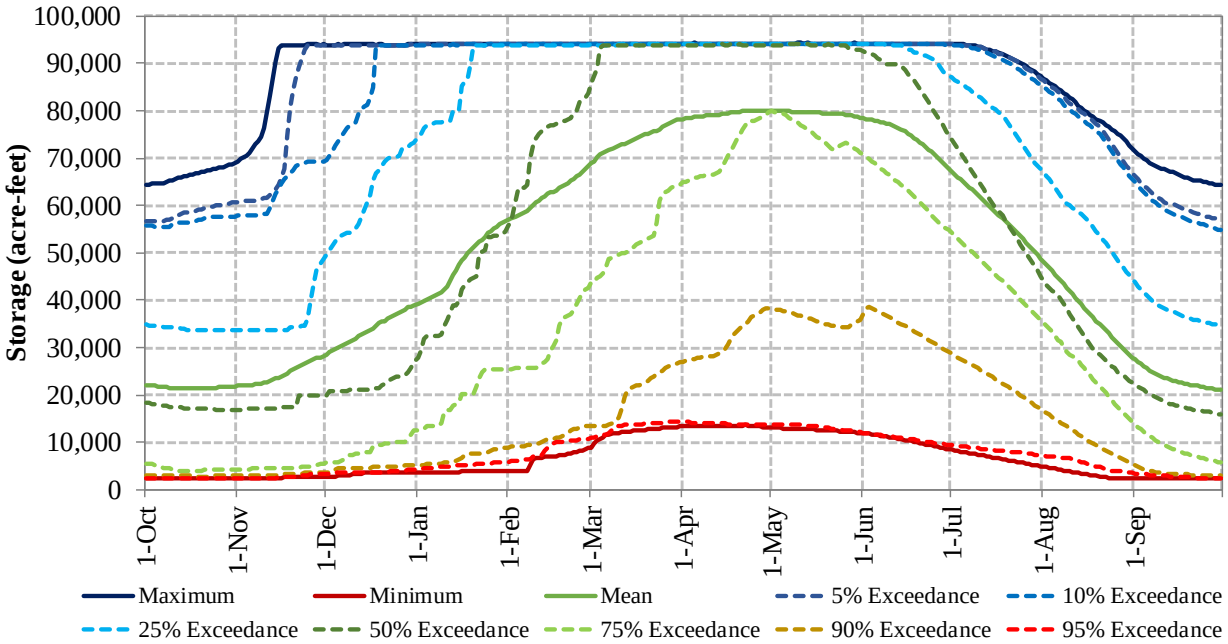

Figure 6.2-1. Daily storage in Camp Far West Reservoir for various percent exceedances for the modeled period from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition).

The area-capacity curve for the Camp Far West Reservoir is provided in Figure 6.2-2. The surface area at the NMWSE of 300 ft is 1,886 ac.

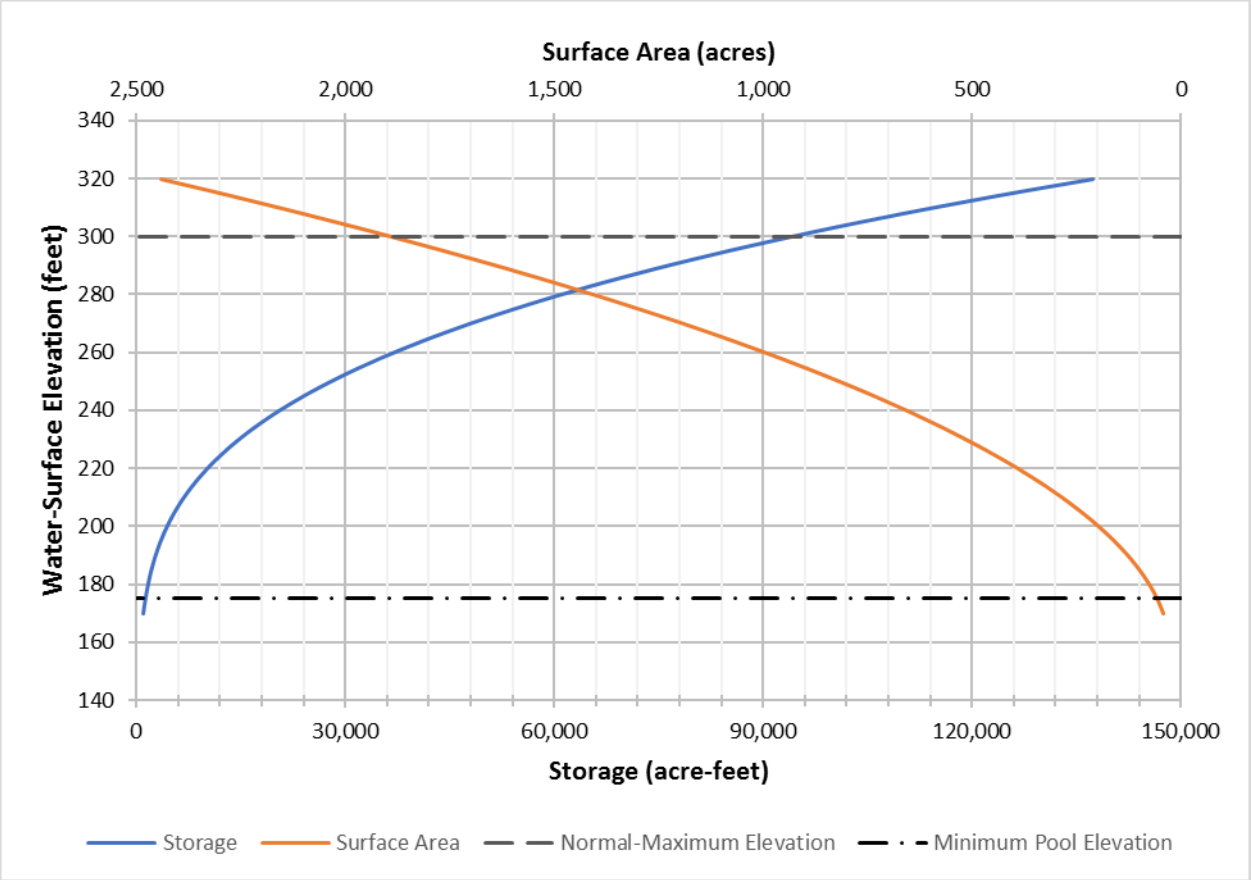

Figure 6.2-2. Camp Far West Reservoir gross and usable area-capacity curves (from GEI Consultants).

Modeled daily average WSEs for Camp Far West Reservoir are graphically presented in Figure 6.2-3. As indicated on the figure, the reservoir storage and elevation can fluctuate significantly from year to year. However, the median and mean curves represent general reservoir operation.

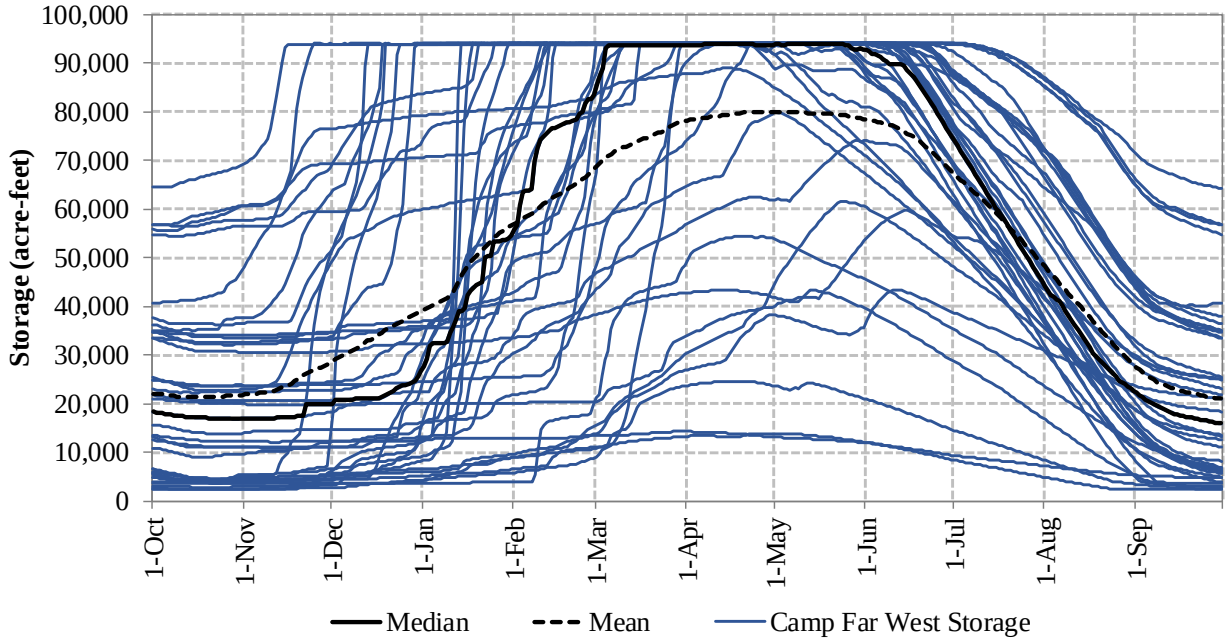

Figure 6.2-3. Camp Far West Reservoir median and mean storage from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition).

SSWD operates the Camp Far West Reservoir in all WYs in a fill-and-spill mode in the winter, and then attempts to get the reservoir as close to empty as possible by the end of the irrigation season. Therefore, the reservoir does not have rule curves for representative dry, normal and wet WYs. The range of reservoir elevations in the representative dry, normal, and wet WYs and annual elevation fluctuation in Camp Far West Reservoir are summarized in Table 6.2-2.

Table 6.2-2. Minimum and maximum elevations in Camp Far West Reservoir in the representative dry, normal and wet Water Years from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline).

Water Year	Minimum Daily Elevation (ft)	Average Daily Elevation (ft)	Maximum Daily Elevation (ft)	Annual Elevation Fluctuation (ft)
2001 (Dry Year)	199.6	237.8	280.6	81.0
2003 (Normal Year)	195.4	265.5	300.2	104.8
1995 (Wet Year)	187.9	268.6	300.2	112.3

The existing spillway rating curve for Camp Far West Reservoir is presented in Figure 6.2-4. The elevation of the spillway crest for the dam is 300 ft.

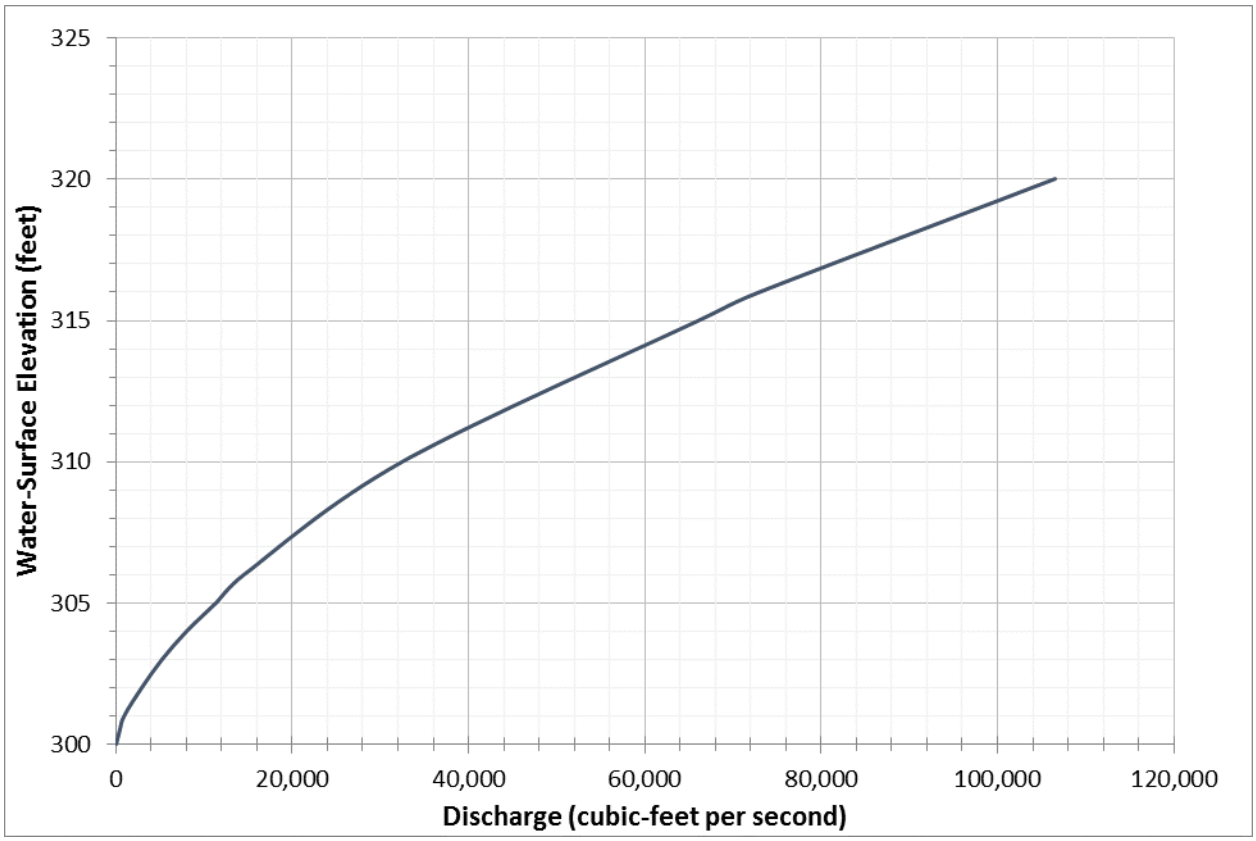

Figure 6.2-4. Camp Far West Dam spillway rating curve (from GEI Consultants).

6.2.2 Water Supply

One of the primary objectives of the Project is to supply water during the irrigation season to CFWID and SSWD. Deliveries to CFWID are set by contract and are only reduced in years when water is physically unavailable. Deliveries to SSWD are set by the allocation determined each spring, and vary based on reservoir storage and forecasted April through September reservoir inflow. Figure 6.2-5 illustrates modeled annual water supply diversions to SSWD under the No Action Alternative along with annual SSWD canal demand (110,000 ac-ft). The ability to deliver surface water in most years is limited by available supply, not demand. Annual canal demand is generally consistent with recent historical records of SSWD's Main Canal diversions in years with adequate supply. The methods detailed in the Ops Model Report to estimate canal demand provide an accurate and appropriate approach to estimate existing canal demands. Under the No Action Alternative, SSWD meets full canal demand in approximately 40 percent of WYs and diverts no water in two WYs over the modeled period of record. On average, 82,900 ac-ft is diverted annually to SSWD.

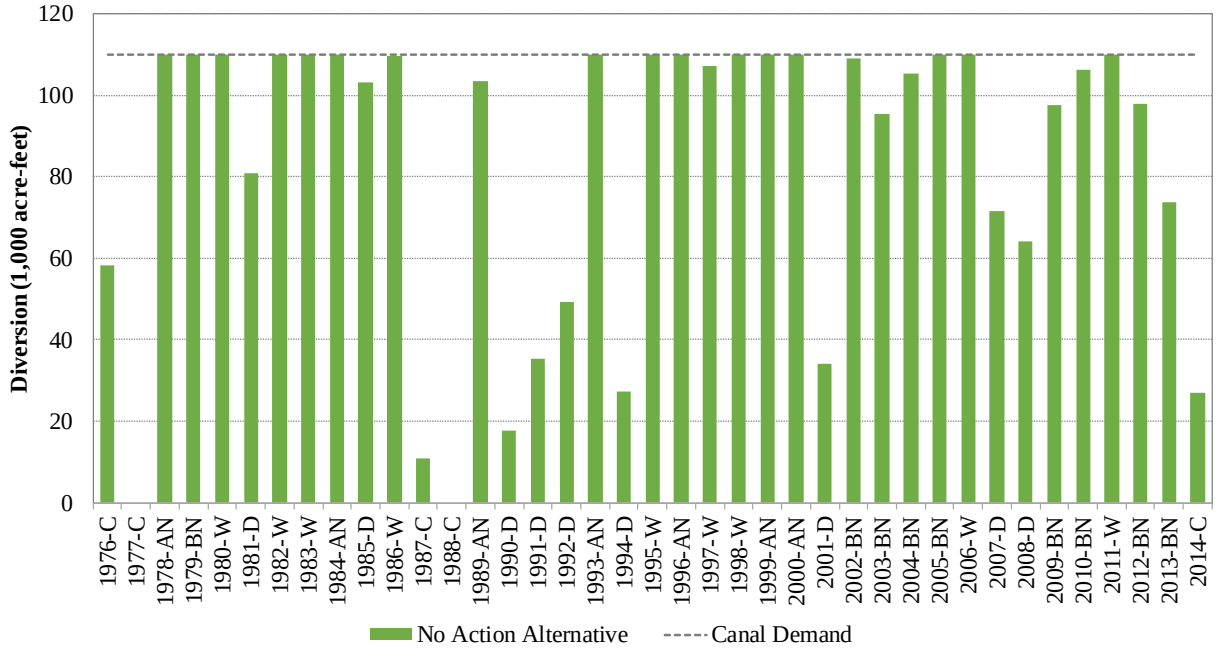

Figure 6.2-5. Annual water supply diversions to SSWD from WY 1976 through WY 2014 under the No Action Alternative (Baseline Condition).

6.2.3 Camp Far West Powerhouse

Operation of the Camp Far West Powerhouse is automatic except for start-up, which is manual. A powerhouse shutdown activates an alarm at SMUD's dispatch center, which requires sending trained personnel to the site to determine the problem and re-start the powerhouse.

Power is produced at Camp Far West Powerhouse during the winter/early spring months when the reservoir is spilling and during the spring and summer months when releases are being made for irrigation and to meet instream flow requirements. Because of the Camp Far West Powerhouse generating unit's operating characteristics, power can only be generated when the WSE of the Camp Far West Reservoir is at or above 236 ft and when reservoir outflow is greater than 130 cfs. If these two criteria cannot be met, water is released through Camp Far West Dam's low-level outlet. This condition normally occurs each year in September and continues into winter when the reservoir refills and surplus inflows are available to be passed through the powerhouse.

During the irrigation season, up to a maximum of approximately 535 cfs passes through the powerhouse in conformance with downstream irrigation and instream requirements. However, during the heavy runoff period, when spilling from the reservoir occurs, a greater quantity of water is routed through the powerhouse up to its maximum limit of 725 cfs.

Accordingly, flow requirements on the Bear River downstream of Camp Far West Dam and Powerhouse are met through a combination of releases from the Camp Far West Powerhouse and

Camp Far West Dam low-level outlet, seepage from the Camp Far West Dam, and spills through the Camp Far West Dam Spillway.

6.2.3.1 Powerhouse Minimum, Maximum and Mean Flows

Minimum-, maximum- and mean-daily average flows based on SSWD's No Action Alternative (Baseline Condition) for WYs 1976 through 2014, are 0 cfs, 650 cfs and 224 cfs, respectively.

6.2.3.2 Powerhouse Hydraulic Capacity

The Camp Far West Powerhouse contains one Francis-type turbine with a nameplate capacity of 6.8 megawatts (MW) under a design head at the plant of 143 ft and a rated flow of 725 cfs.

6.2.3.3 Powerhouse Flow Duration Curves

Modeled daily flow duration curves (by month and over the simulation period) for releases from the Camp Far West Powerhouse, based on SSWD's No Action Alternative for WYs 1976 through 2014, are provided in Figure 6.2-6. The flow duration curves show the exceedance probability for daily flow through the powerhouse in each month and over the simulation period of record. As these are flows through the powerhouse, only flows above the minimum powerhouse flow requirement of 130 cfs and below the maximum allowable modeled flow of 650 cfs are shown on this curve. The 1976-2014 curve indicates that power is generated in approximately 45 percent of days over the simulation period of record.

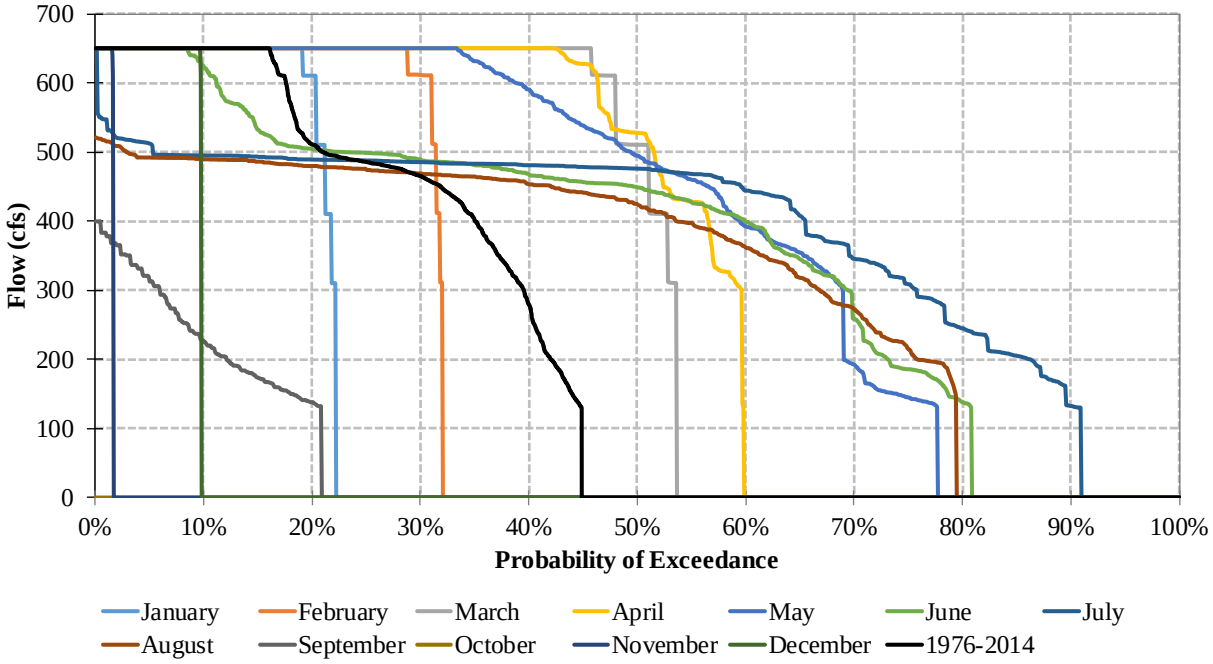

Figure 6.2-6. Modeled daily (by month and over the simulation period) flow duration curves for Camp Far West Powerhouse from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline).

6.2.3.4 Powerhouse Capability versus Head

Powerhouse capability versus head is shown in Figure 6.2-7. Minimum- and maximum-operating heads for Camp Far West Powerhouse are 90 ft (corresponding to a reservoir surface elevation of 236 ft and 17,971 ac-ft of storage) and 160 ft (corresponding to a reservoir surface elevation of 300 ft and 93,737 ac-ft of storage).

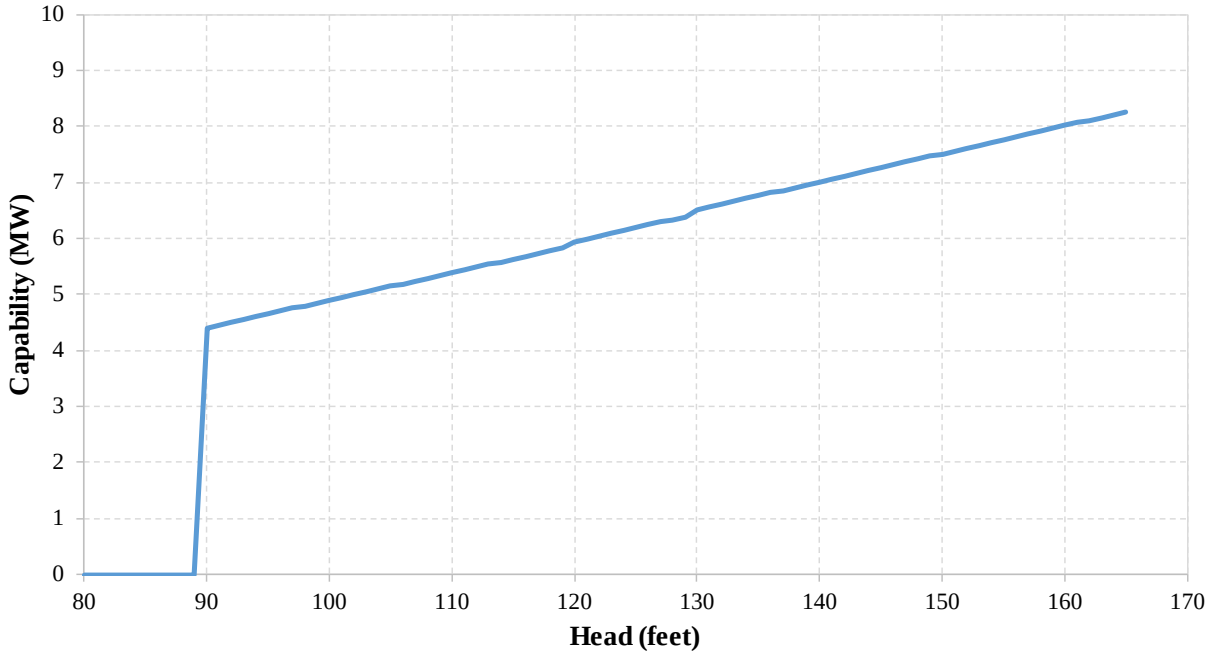

Figure 6.2-7. Camp Far West Powerhouse capability curve.

6.2.3.5 Tailwater Rating Curve

Figure 6.2-8 shows the tailwater rating curve for the Camp Far West Powerhouse.

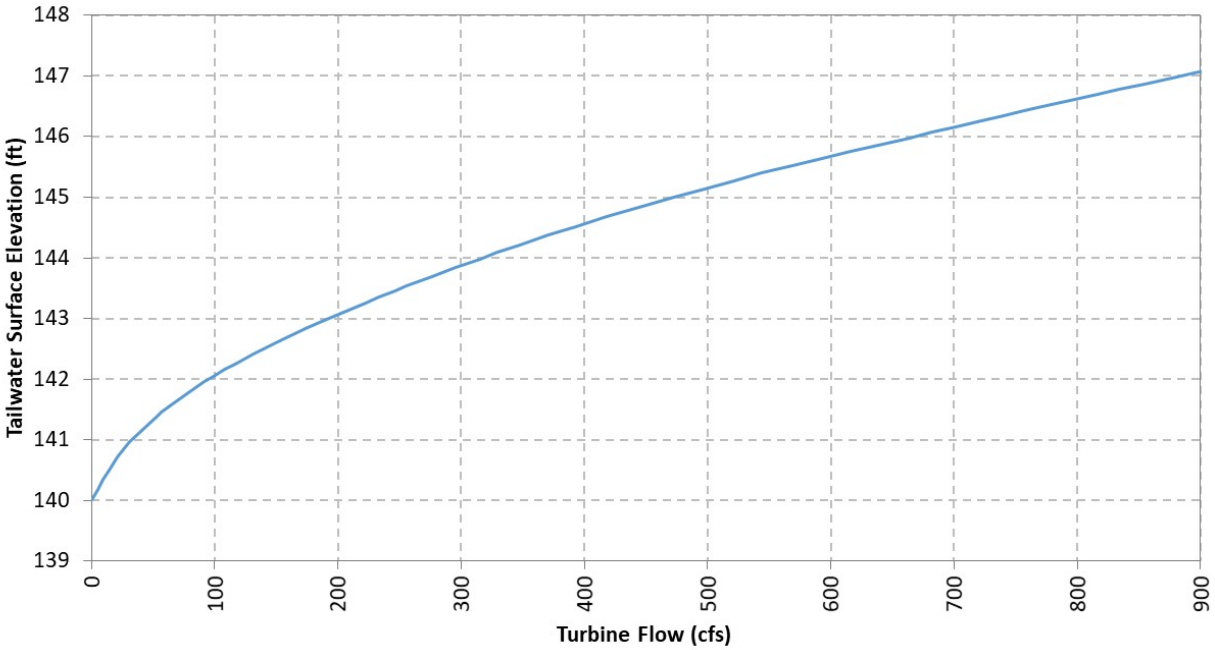

Figure 6.2-8. Tailwater rating curve for Camp Far West Powerhouse.

6.2.3.6 Average Annual Energy Production

Camp Far West Powerhouse would have generated an average of 20,381 MWh/yr from 1976 to 2014 under SSWD's No Action Alternative. The average annual plant factor for the powerhouse for this time period is 0.34 based on the annual generation divided by the plant nameplate generating capability (6.8 MW) times the number of hours per year. Annual gross generation and plant factors for the powerhouse are provided in Table 6.2-3.

Table 6.2-3. Annual generation and plant factors for Camp Far West Powerhouse from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline).

Water Year	Annual Generation (aMW)	Annual Generation (MWh)	Plant Capability (MWh)	Plant Factor
1976	0.4	3,245	59,731	0.05
1977	0.0	0	59,568	0.00
1978	3.4	29,945	59,568	0.50
1979	2.8	24,737	59,568	0.42
1980	3.8	33,629	59,731	0.56
1981	0.9	7,478	59,568	0.13
1982	4.6	40,397	59,568	0.68
1983	5.2	45,587	59,568	0.77
1984	4.9	42,796	59,731	0.72
1985	1.7	14,938	59,568	0.25
1986	3.1	27,201	59,568	0.46
1987	0.0	0	59,568	0.00
1988	0.0	0	59,731	0.00
1989	2.1	18,097	59,568	0.30
1990	0.1	570	59,568	0.01
1991	0.3	2,969	59,568	0.05
1992	0.3	2,950	59,731	0.05
1993	3.6	31,741	59,568	0.53
1994	0.2	1,706	59,568	0.03
1995	4.2	36,807	59,568	0.62
1996	3.9	33,937	59,731	0.57
1997	4.1	35,719	59,568	0.60
1998	4.0	35,051	59,568	0.59
1999	3.7	32,087	59,568	0.54
2000	3.2	28,301	59,731	0.47
2001	0.3	2,487	59,568	0.04
2002	2.5	21,504	59,568	0.36
2003	2.8	24,767	59,568	0.42
2004	2.4	21,006	59,731	0.35
2005	2.9	25,760	59,568	0.43
2006	4.3	38,085	59,568	0.64
2007	1.1	9,241	59,568	0.16
2008	0.6	5,004	59,731	0.08
2009	2.4	21,398	59,568	0.36
2010	2.1	18,414	59,568	0.31
2011	4.8	42,271	59,568	0.71
2012	2.2	19,242	59,731	0.32
2013	1.6	13,717	59,568	0.23

Table 6.2-3. (continued)

Water Year	Annual Generation (aMW)	Annual Generation (MWh)	Plant Capability (MWh)	Plant Factor
2014	0.2	2,065	59,568	0.03
Total	**90.7**	**794,849**	--	--
Minimum	**0.0**	**0**	--	**0.00**
Average	**2.3**	**20,381**	--	**0.34**
Median	**2.4**	**21,398**	--	**0.36**
Maximum	**5.2**	**45,587**	--	**0.77**

Key: aMW = annual megawatt; MWh = megawatt-hour

6.2.3.7 Station Power

SSWD estimates that, on average, less than 1 kW of Project power is used on site to serve the Camp Far West Powerhouse.

6.2.3.8 Camp Far West Powerhouse Dependable Capacity

The dependable capacity of a generating facility is defined as "*the generating capacity that the plant can deliver under the most adverse water supply conditions to meet the needs of an electric power system with a given maximum demand*." (Elliott et al. 1997). One of the critical parameters for defining dependable capacity is the period over which the capacity must be provided. Traditionally, a season that coincides with peak seasonal demand is used for the time period over which capacity is calculated. For base load generation in California, the time period of the most adverse hydrology was the WY 1977; therefore, the period of July and August 1977 was used for this analysis. Based on this time period, the dependable capacity of the Project is estimated at 0 kW.

6.3 Flows in the Bear River Downstream of the Project

Downstream of Camp Far West Dam, the SSWD Main Canal has the capacity to divert up to 435 cfs, the CFWID South Canal has the capacity to divert up to 40 cfs, and the CFWID North Canal has the capacity to divert up to 35 cfs.

6.3.1 Bear River Fish Release below Camp Far West Reservoir

The compliance point for the flow requirements in the existing FERC license is at the fish release gage (USGS 11423800), which is located at a structure off the non-Project diversion dam into the SSWD Conveyance Canal at the south edge of the non-Project diversion dam, approximately 1.2 mi downstream of Camp Far West Reservoir. The gage is a low-flow gage and does not measure spill or total release from the non-Project diversion dam. The fish flow gage has been in active operation since October 1989.

In the Ops Model, compliance with the FERC license is met through flow release below the non-Project diversion dam. Modeled flow below the diversion dam includes releases into the river through the fish release gage and spill from the diversion dam. Figure 6.3-1 shows modeled flow

below the diversion dam. The simulated maximum monthly average flow was 6,097 cfs, which occurred in January 1997.

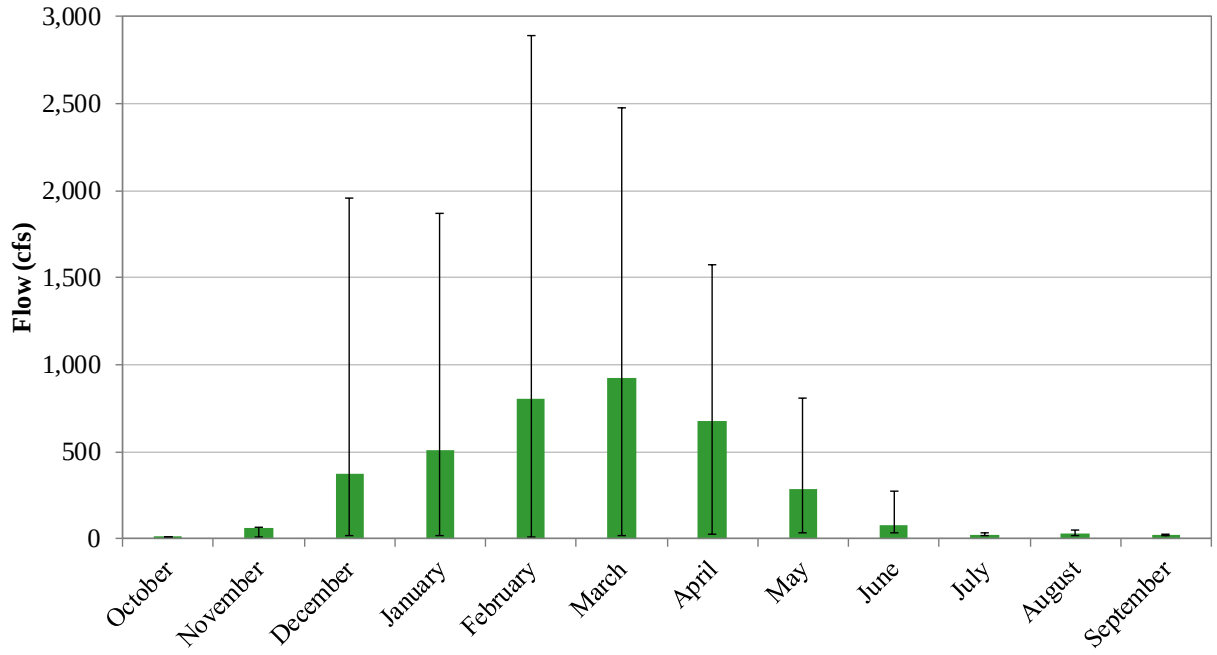

Figure 6.3-1. Mean monthly flow release through the Camp Far West Reservoir fish release gage plus spill from the non-Project diversion dam from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). The bar shows the values for the 10 percent and 90 percent exceedances.

Figure 6.3-2 shows the modeled mean daily flows below the non-Project diversion dam. The simulated maximum daily average flow was approximately 46,000 cfs, which occurred on January 2, 1997.

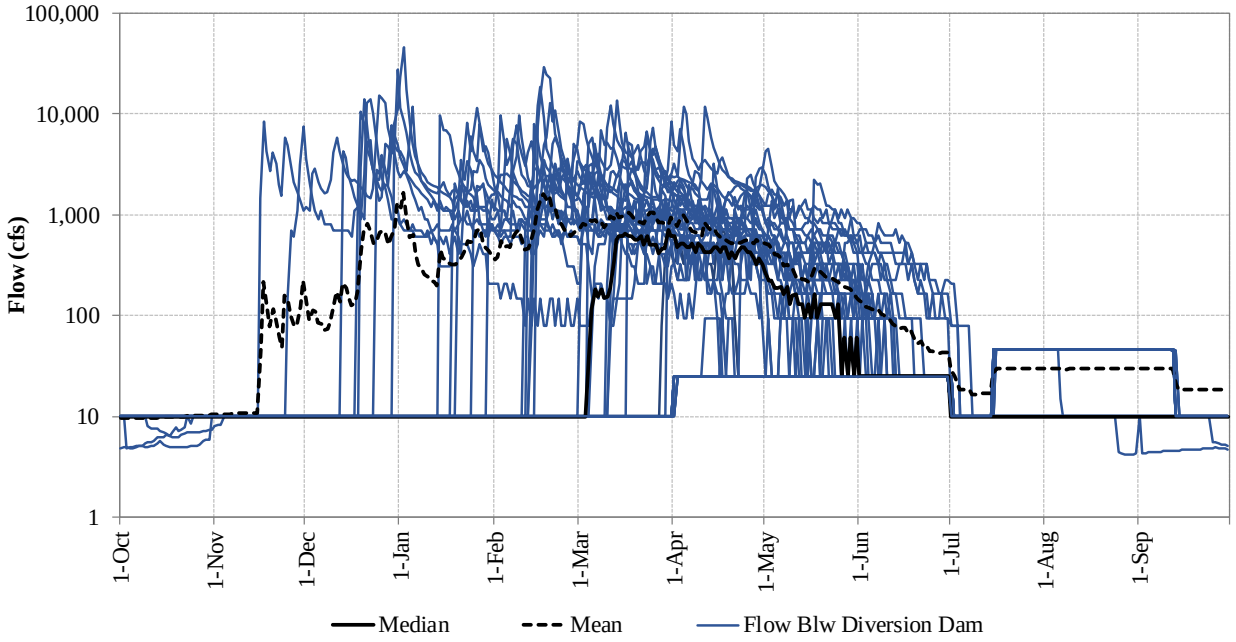

Figure 6.3-2. Mean daily flow below the non-Project diversion dam each year from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 6.3-3 shows modeled flow exceedance of the mean daily streamflow below the non-Project diversion dam for the modeled period. Daily flow exceeds 25 cfs 28 percent of the time, and exceeds 100 cfs 21 percent of the time. Figure 6.3-4 shows modeled flow exceedance curves for daily flows (by month and over the simulation period) below the non-Project diversion dam. In most months, flow exceeds the minimum instream flow less than 40 percent of the time. However, the peak runoff months of March through May experience average daily flow greater than minimum flow requirements more than 50 percent of the time.

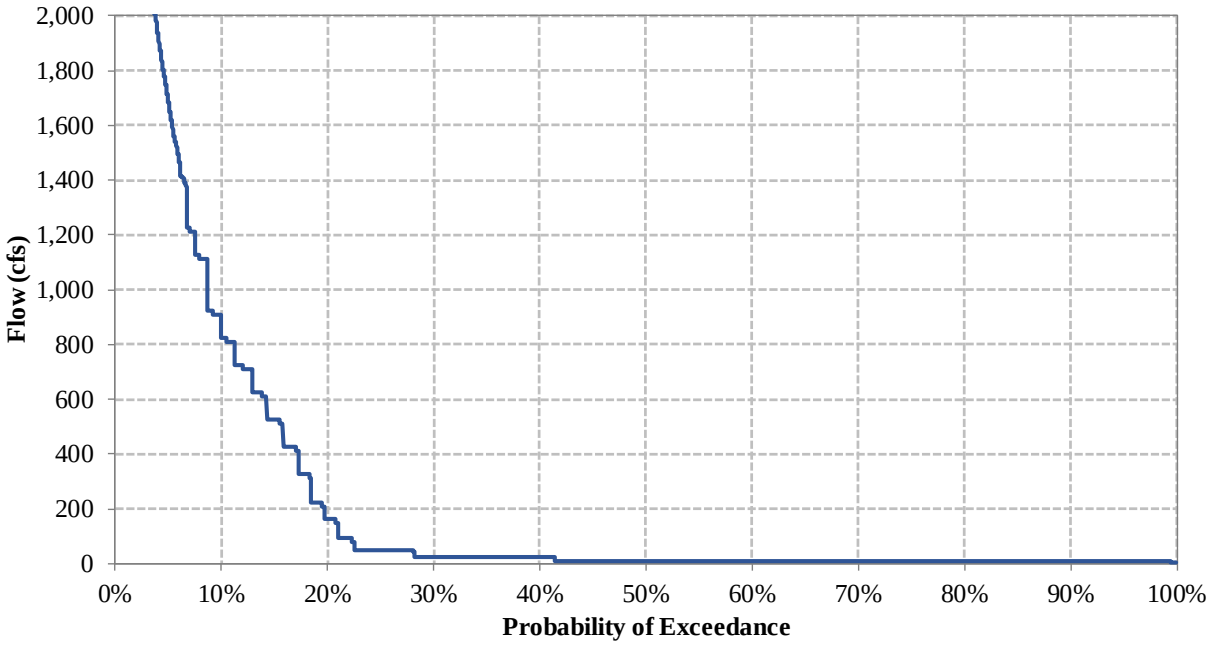

Figure 6.3-3. Flow exceedance below the non-Project diversion dam from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition).

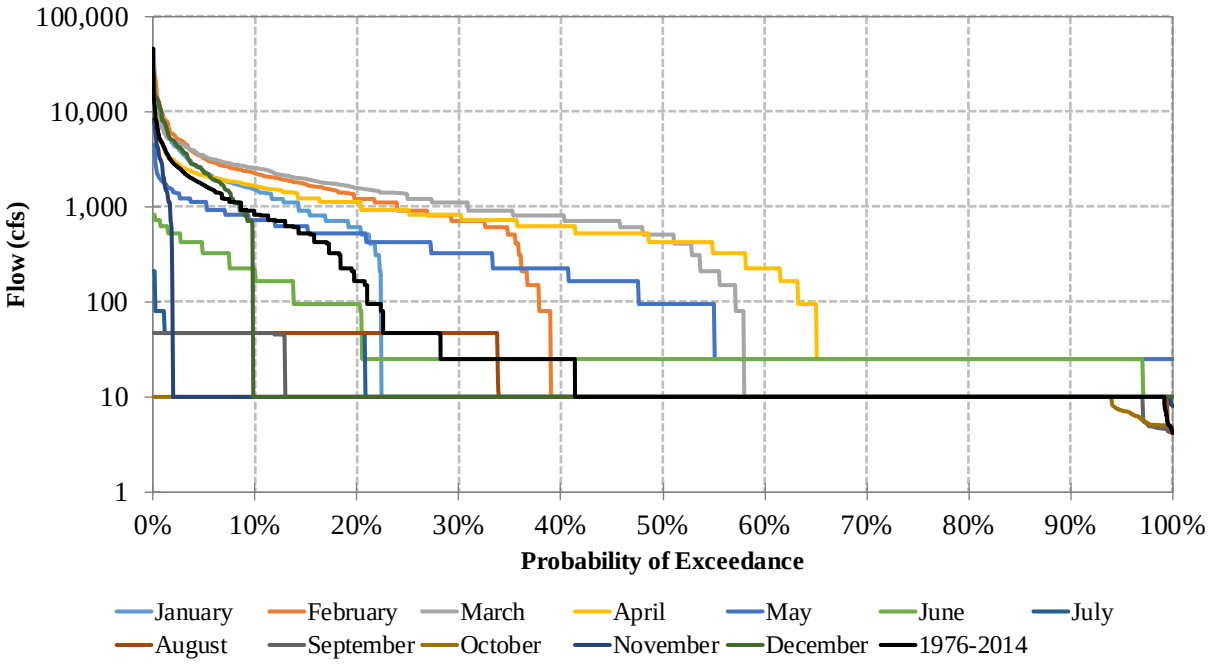

Figure 6.3-4. Modeled daily (by month and over the simulation period) flow duration curves for flow below the non-Project diversion dam from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Flow is plotted in logarithmic scale to better show both high and low values.

6.3.2 Bear River Near Wheatland

The primary full-flow-rated gage used for flow characterization in the lower Bear River is the Wheatland gage (USGS 11424000). The gage is located approximately 6.5 mi downstream of Camp Far West Dam, and reflects releases from Camp Far West Reservoir through the powerhouse, low-level outlet, and spills over Camp Far West Dam less diversions from the non-Project diversion dam to SSWD and CFWID. The Wheatland gage has been in active operation since October 1928. SSWD's Ops Model calculates flow on the Bear River near Wheatland. Figure 6.3-5 shows average monthly-modeled streamflow for the Bear River near Wheatland. The simulated maximum monthly average streamflow was 6,102 cfs, which occurred in January 1997.

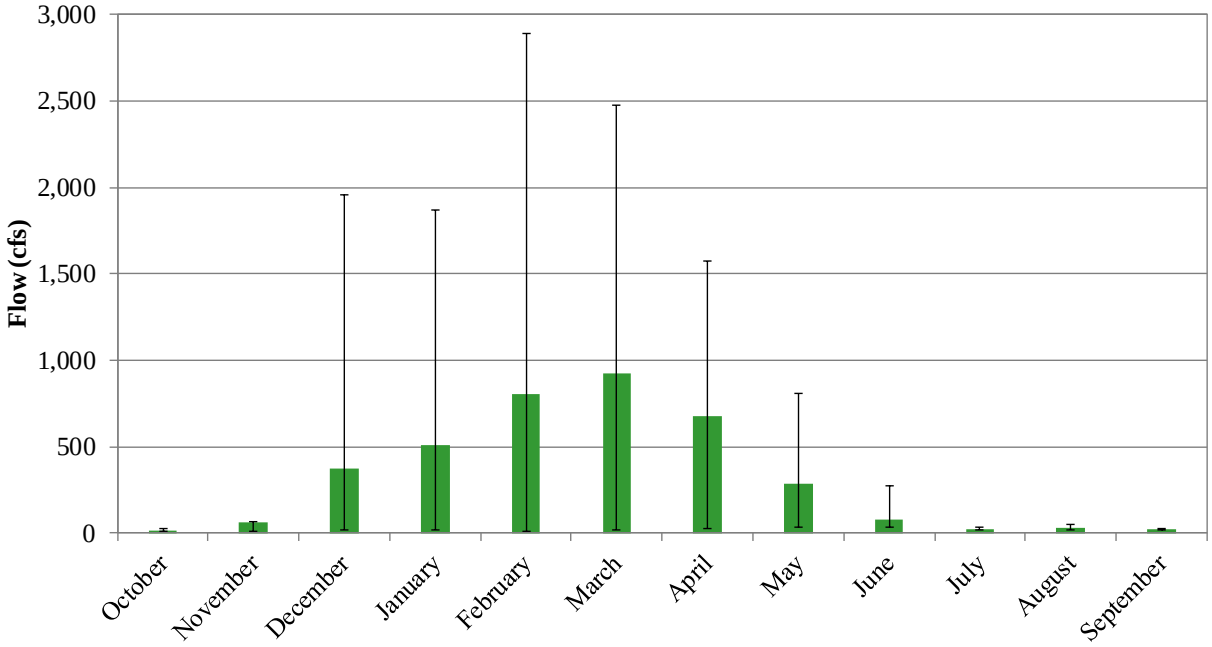

Figure 6.3-5. Mean monthly streamflow for the Bear River near Wheatland from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Bars show the values for the 10 percent and 90 percent exceedances.

Figure 6.3-6 shows the modeled mean daily streamflow for the Bear River near Wheatland under the No Action Alternative. The simulated maximum daily average streamflow was 46,036 cfs, which occurred on January 2, 1997. The only other simulated flows above 25,000 cfs occurred on February 17, 1986 (29,396 cfs) and December 31, 2005 (27,384 cfs).

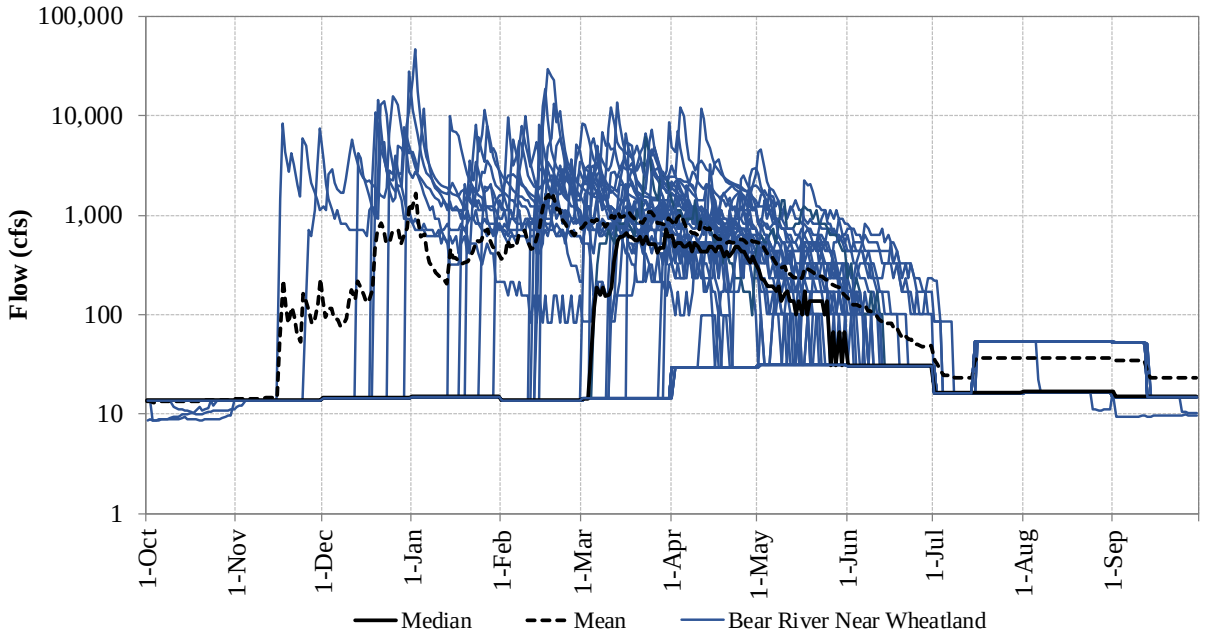

Figure 6.3-6. Mean daily streamflow for the Bear River near Wheatland from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 6.3-7 shows modeled flow exceedance of the mean daily streamflow for the Bear River near Wheatland during the simulation period. Daily flow exceeds 25 cfs 41 percent of the time and exceeds 100 cfs 22 percent of the time.

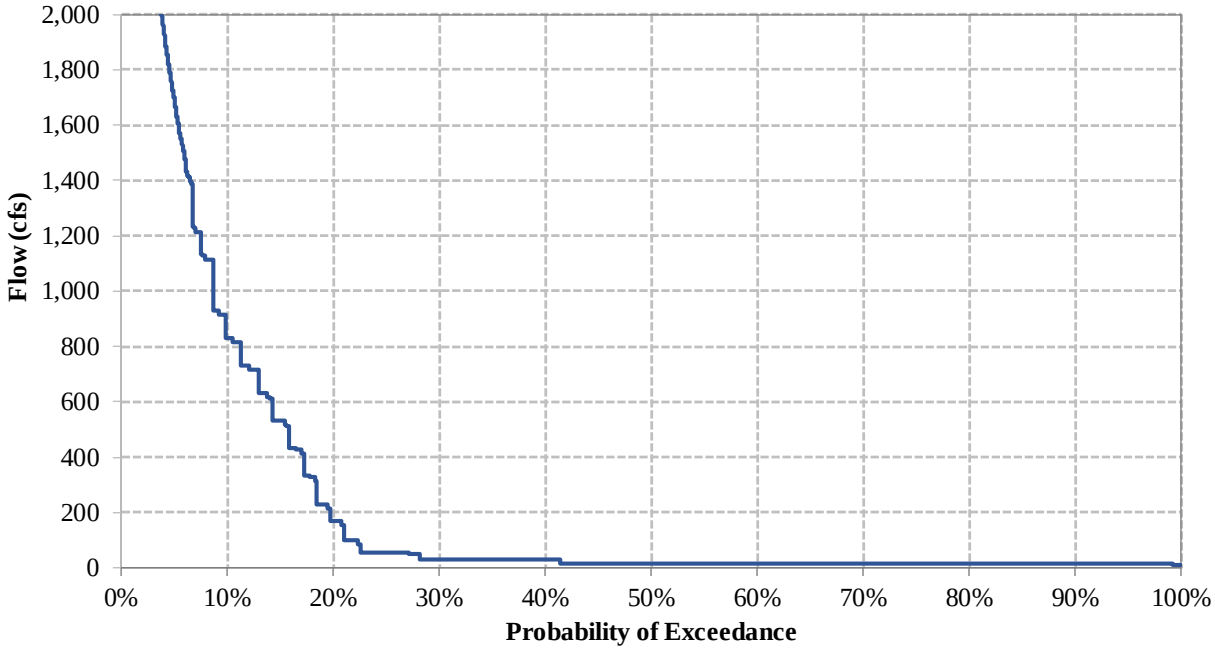

Figure 6.3-7. Flow exceedance curve for the Bear River near Wheatland from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition).

Figure 6.3-8 shows modeled flow exceedance curves for daily flows (by month and over the simulation period) for the Bear River near Wheatland. Results are similar in magnitude and probability to streamflow below the non-Project diversion dam.

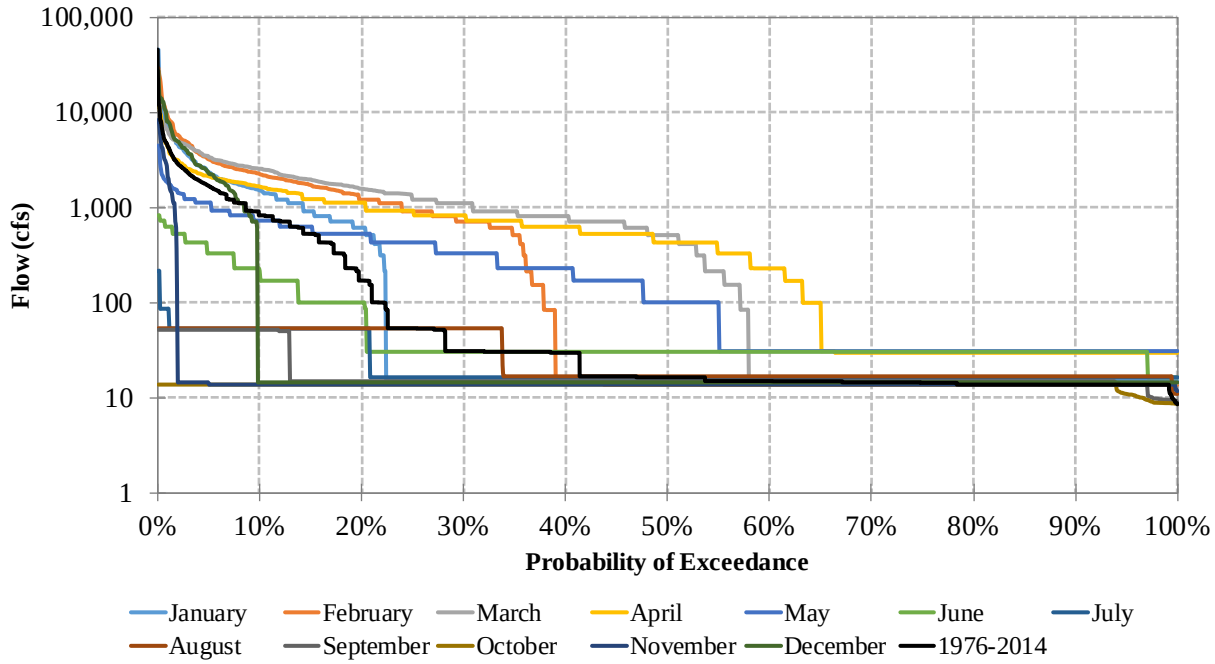

Figure 6.3-8 Modeled daily (by month and over the simulation period) flow duration curves for the Bear River near Wheatland from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Flow is plotted in logarithmic scale to better show both high and low values.

6.3.3 Bear River at Confluence with the Feather River

The Bear River is a tributary to the Feather River and flows into the Feather River approximately 11 river miles downstream from the Wheatland gage. Flows at the confluence reflect upstream (Wheatland) flows and accretions or depletions that occur along the lower Bear River, notably inflow from Dry Creek that enters from the north approximately 5 river miles upstream of the confluence.

Figure 6.3-9 shows average monthly-modeled streamflow for the Bear River at the Feather River confluence. The simulated maximum monthly average streamflow was 6,865 cfs, which occurred in January 1997.

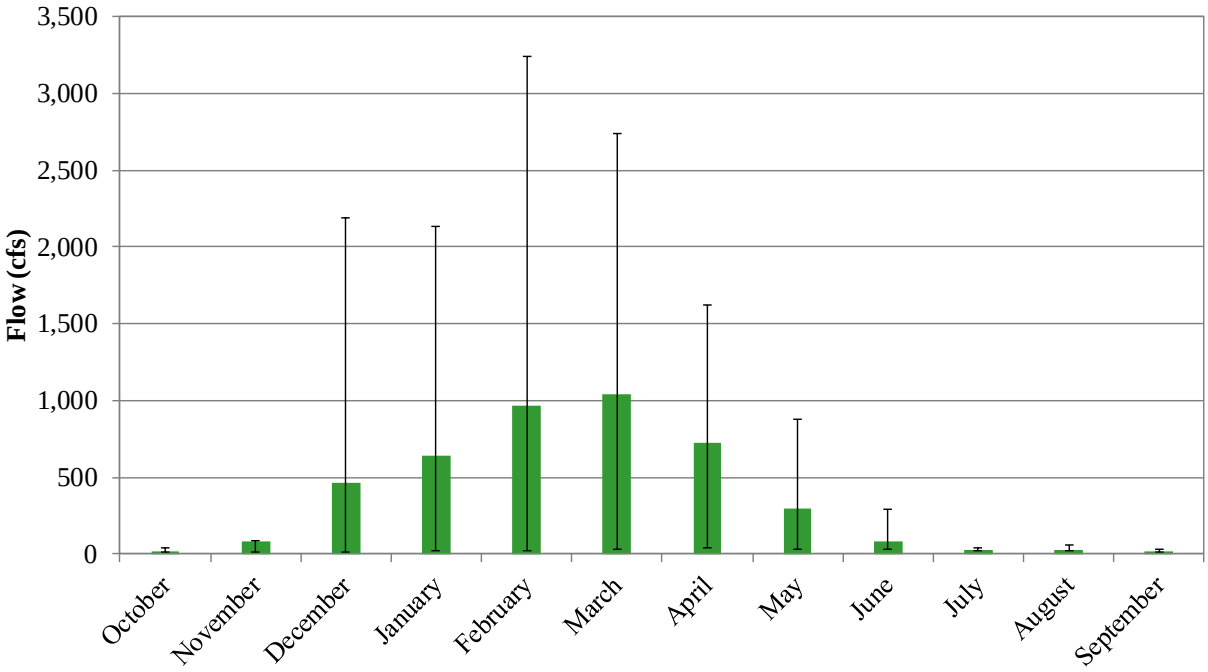

Figure 6.3-9. Mean monthly streamflow for the Bear River at the Feather River confluence from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Bars show the values for the 10 percent and 90 percent exceedances.

Figure 6.3-10 shows the modeled mean daily streamflow for the Bear River at the Feather River confluence. The simulated maximum daily average streamflow was 51,938 cfs, which occurred on January 2, 1997. Results are somewhat different from Bear River streamflow near Wheatland, given the influence from Dry Creek inflows.

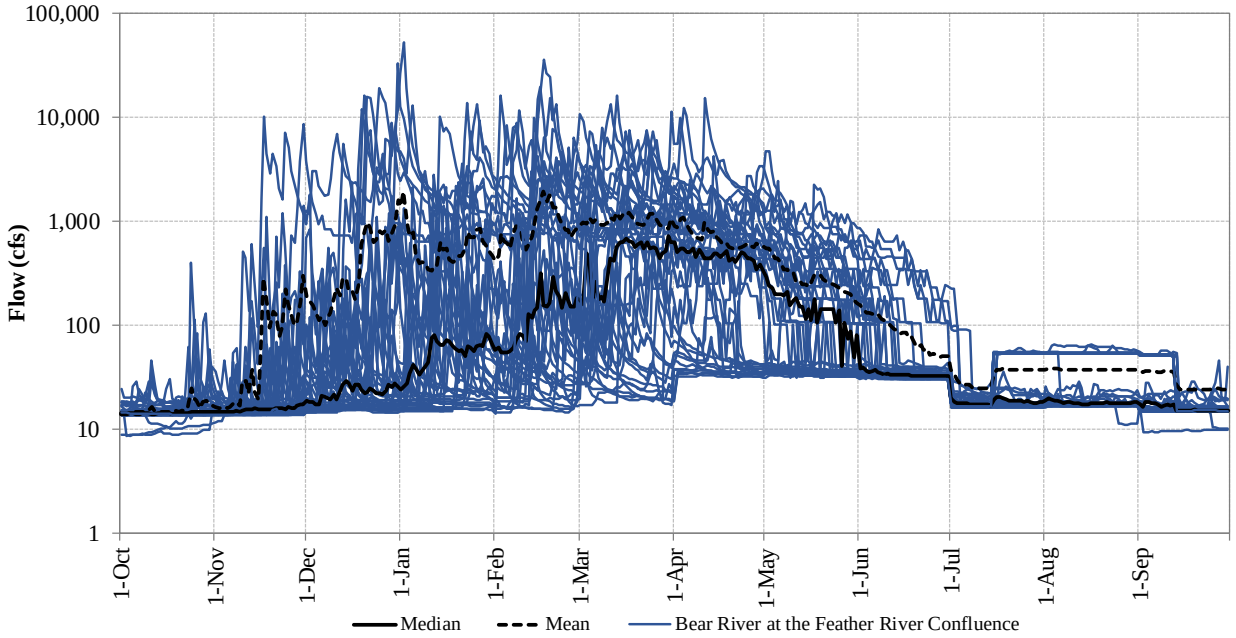

Figure 6.3-10. Mean daily streamflow for the Bear River at the Feather River confluence from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 6.3-11 shows modeled flow exceedance of the mean daily streamflow for the Bear River at the Feather River confluence over the simulation period. Daily flow exceeds 25 cfs 55 percent of the time and exceeds 100 cfs 27 percent of the time. Figure 6.3-12 shows modeled flow exceedance curves for daily flows (by month and over the simulation period) for the Bear River at the Feather River confluence. Results are somewhat different in magnitude and probability to streamflow below the non-Project diversion dam, given the influence from Dry Creek inflows.

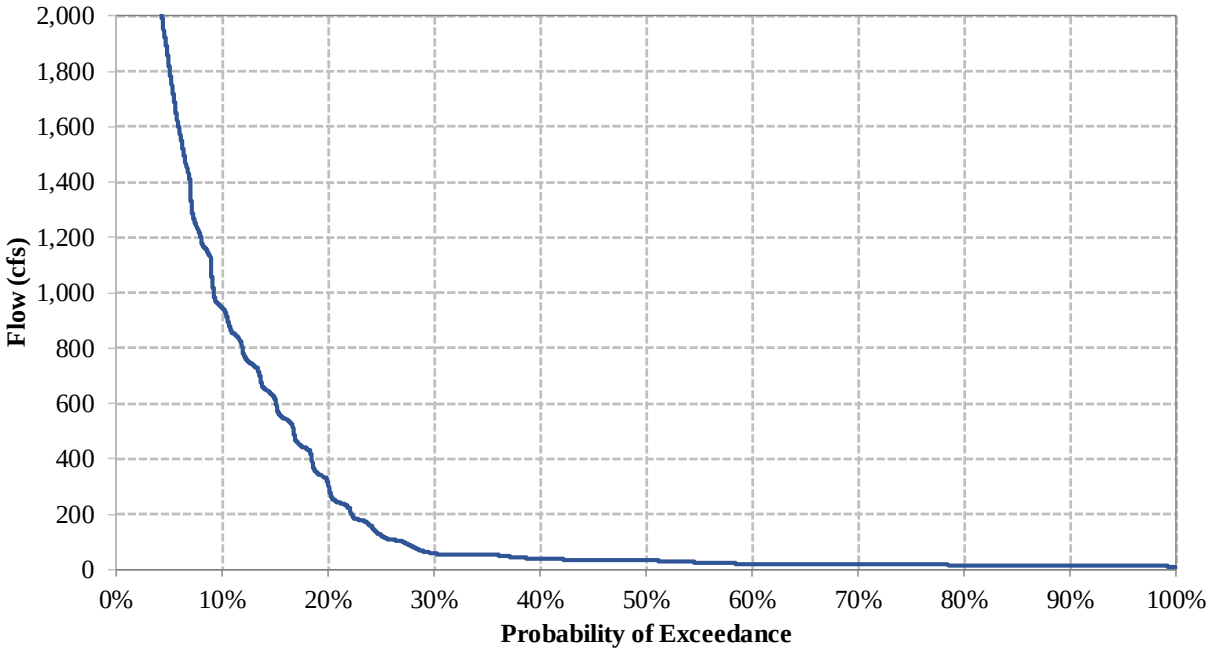

Figure 6.3-11. Flow exceedance curve for the Bear River at the Feather River confluence from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition).

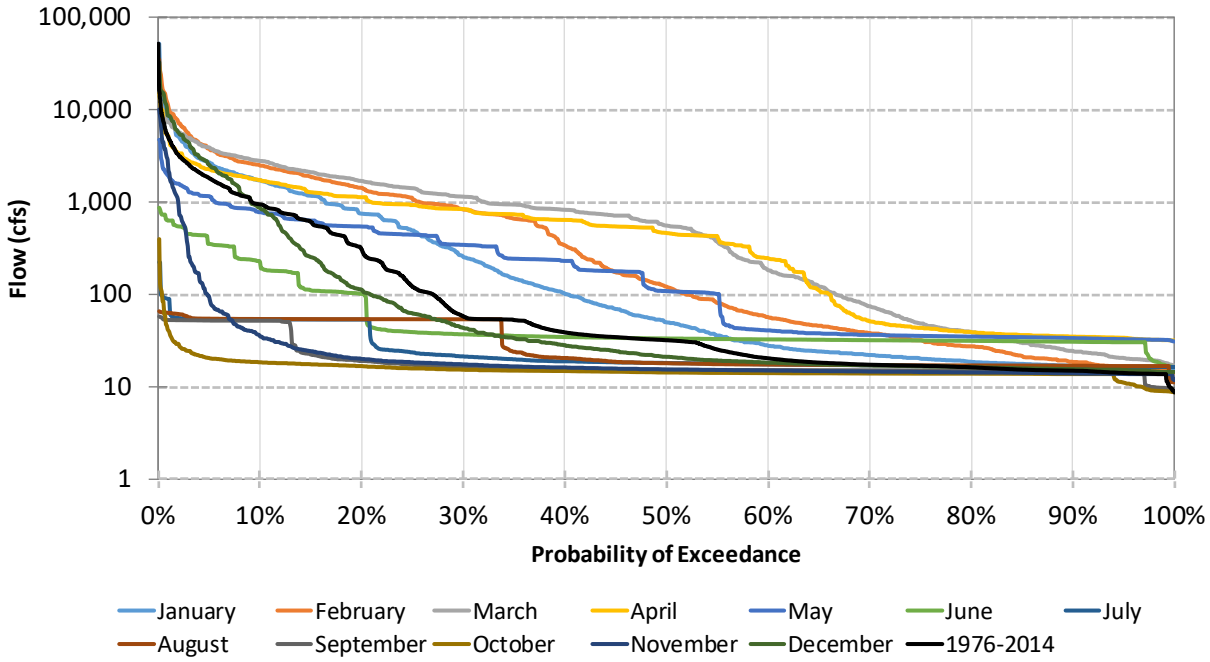

Figure 6.3-12. Modeled daily (by month and over the simulation period) flow duration curves for the Bear River at the Feather River confluence from WY 1976 through WY 2014 under SSWD's No Action Alternative (Baseline Condition). Flow is plotted in logarithmic scale to better show both high and low values.

6.4 Facility Maintenance

6.4.1 Camp Far West Powerhouse Maintenance

SMUD conducts annual mechanical and electrical inspections and maintenance at the Camp Far West Powerhouse to verify the structural and/or functional integrity of the facilities and to identify conditions that might disrupt operations. The Camp Far West Powerhouse unit is offline to support planned outages for approximately 2-3 weeks in the September/October period. During an unplanned outage, such as when the unit trips offline, water flows to the low-level outlet. Depending on maintenance work needed on the tunnel and penstock, it can be dewatered by closing the intake gates.

6.4.2 Other Facility Maintenance

Routine maintenance activities conducted in the vicinity of Project Facilities include vegetation management, pest management, road and trail maintenance, maintenance of communication facilities, debris management, and facility painting. Each of these activities is described below.

6.4.2.1 Vegetation Maintenance

Vegetation management, manually using hand tools and chemically by the use of herbicides, is implemented by SSWD at Project Facilities. Vegetation management is completed throughout the Project Area as necessary to reduce fire hazard, to provide for adequate Project Facility access and inspection, to protect Project Facilities, and to provide for worker and public health and safety. In general, vegetation management is implemented within about 75 ft of the powerhouse and switchyard; within about 15 ft on either side of roads and trails to Project Facilities; and within recreation areas.

Vegetation management occurs both by hand trimming and herbicides. Hand trimming includes trimming grasses and forbs using string trimmers, and removal or trimming of overhanging shrubs and tree limbs using a chain saw or other handheld saw or clippers. These management activities are conducted as needed in conjunction with facility inspections.

Herbicides, in combination with surfactants, are used in combination with hand trimming vegetation management activities on an annual basis at Project Facilities located on SSWD-owned property. All herbicide applications are supervised by a Qualified Applicator with direction of a licensed Pest Control Advisor (PCA). The PCA prepares Pest Control Recommendations (PCR) consistent with the specific herbicide label(s) for each site prescribing specific application direction and associated precautions that must be strictly followed. All-terrain vehicles, other vehicles (pick-up trucks), backpack sprayers, or small hand-held sprayers are used to apply herbicides. Herbicide application occurs, at a minimum, twice annually. These applications occur between December 1 and March 31, as determined by the PCA for pre-emergents, and seasonally dependent, typically occurring between April 1 and June 30. This cycle is for follow-up visits to apply post-emergent herbicide application and/or additional treatments as needed. A third cycle, if required, is completed between July 1 and October 14.

6.4.2.2 Hazard Trees

Hazard trees, generally defined as dead or dying trees or trees with defects that may result in failure and have the potential to cause property damage, personal injury, or death, are removed as needed. Removal is conducted with a chainsaw, handheld saw, or other equipment. Smaller diameter debris from felled hazard trees is either chipped or lopped and scattered. Downed logs are typically left onsite and only moved if needed for safety. If moving logs is necessary, it may be completed by hand or machine depending on the situation.

6.4.2.3 Vertebrate Pest Management

SSWD implements rodent control as needed in facility interiors using an integrated pest management approach that includes sanitation and exclusion. General use of rodenticides, applied in accordance with the label instruction, may be used when necessary.

6.4.2.4 Road Maintenance

Regular inspection of the Project access roads occurs during the course of day-to-day Project activities. Road maintenance on Project and shared roads occurs as needed. Maintenance generally includes, but is not limited to, the following types of activities: debris removal; filling potholes; grading, sealing, and surfacing; maintenance or replacement of erosion control features (e.g., culverts, drains, ditches, and water bars); repair, replacement, or installation of access control structures such as posts, cables, rails, gates, and barrier rock; and repair and replacement of signage. Vegetation management may be conducted concurrently with road maintenance.

6.4.2.5 Facility Painting

SSWD paints the exterior of Project Facilities, including the powerhouse and ancillary facilities as needed.

6.4.2.6 Recreation Facilities Maintenance

SSWD, through a concessionaire, routinely maintains the Project recreation facilities at the North and South Shore recreation areas. Typical routine maintenance activities include litter and trash collection, lowering/raising the boat launch docks as the water level changes, fire pit cleaning and ash removal, cleaning and maintaining restroom buildings, gate and traffic control maintenance, keeping roadways and parking areas clear of debris, and public signage maintenance. In addition, SSWD routinely maintains and tests the water supply system and sewage treatment ponds with aerators that serve the flush restroom buildings and RV sanitary dump stations at both recreation areas.

7.0 SSWD's Proposed Project Operations

Operations of SSWD's reservoir, dam, and powerhouse under SSWD's Proposed Project (Proposed Project) are presented below. SSWD has modeled operations of the Proposed Project

in its Ops Model using the same modeling tools used for the No Action Alternative. Accordingly, many of the facility features are identical to those described in Section 6.0. Differences in operations from the No Action Alterative are described here, as are the model output resulting from modeled operations according to the Proposed Project.

7.1 Changes to Operating Constraints

7.1.1 Changes to Proposed Facilities

Exhibit A of SSWD's Application for New License describes SSWD's existing and proposed Project facilities. SSWD proposes to maintain all existing facilities with the following modification: 1) increase the Camp Far West Reservoir NMWSE by 5 ft from 300 ft to 305 ft by raising the spillway crest to elevation 305 ft.; 2) modifications to Project recreation facilities; and, 3) addition of a Primary Project Road. A discussion about how the changes would affect existing Project operations is below. Refer to Exhibit A for a detailed description of the Proposed Project facilities.

7.1.1.1 Camp Far West Reservoir

The Proposed Project would not affect the existing Camp Far West Dam spillway-rating curve, which is shown in Figure 6.2-5.

The Proposed Project would increase the NMWSE of Camp Far West Reservoir to 305 ft. The area-capacity curve for Camp Far West Reservoir with a NMWSE of 305 ft is shown in Figure 7.1-1. The surface area at the NMWSE of 305 ft is 2,018 ac.

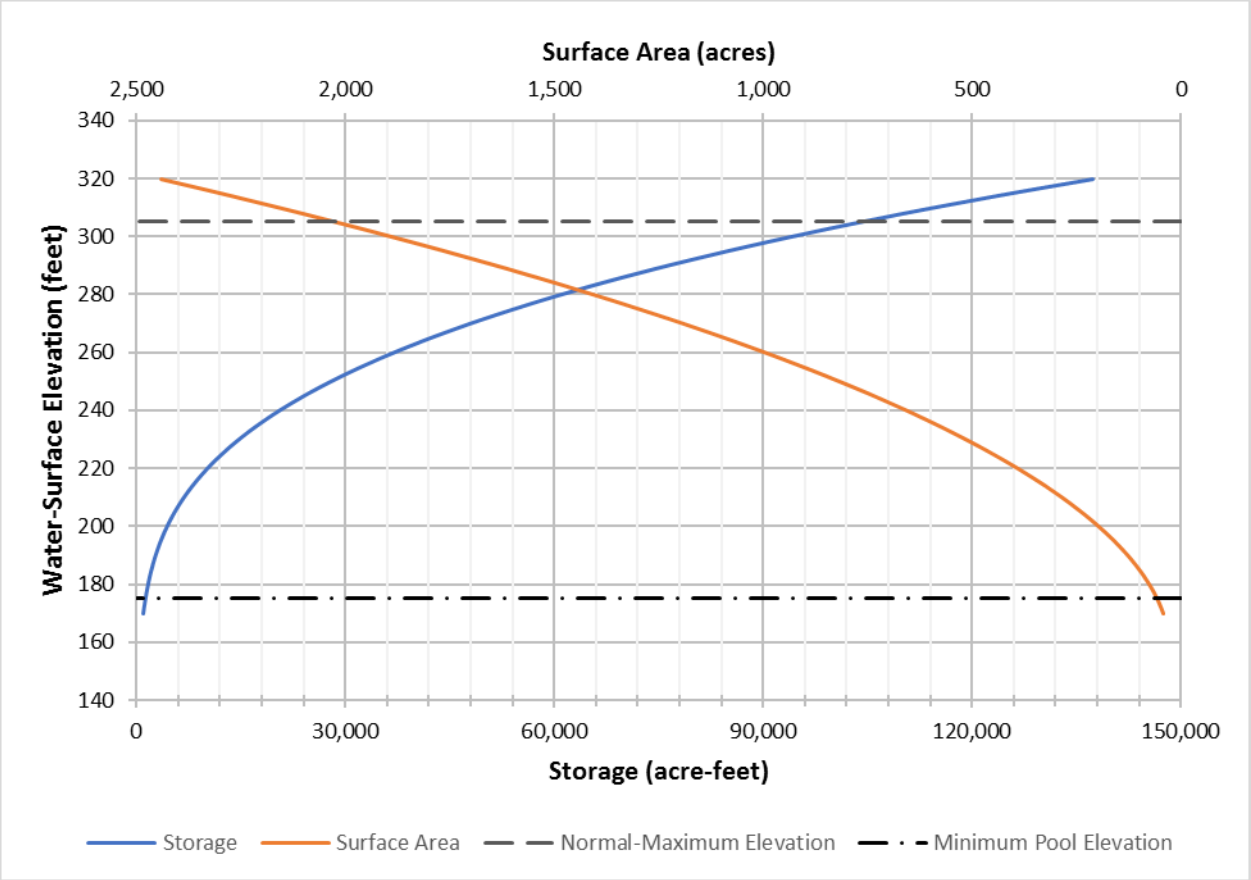

Figure 7.1-1. Camp Far West Reservoir gross and usable area-capacity curves for the Proposed Project (from GEI Consultants).

7.1.2 SSWD's Proposed Conditions in the New License

SSWD developed Proposed Conditions, including associated implementation plans, for the new licenses. These conditions are:

- SSWD Proposed Condition WR1, Implement Water Year Types. SSWD shall determine the WY types in this condition, and shall use the determinations to implement articles and conditions of the license that are dependent on WY type.
- SSWD Proposed Conditions AR1, Implement Minimum Streamflows. SSWD shall maintain the minimum streamflows in the Bear River downstream of the Project as described in this condition.
- SSWD Proposed Condition AR2, Implement Fall and Spring Pulse Flows. SSWD shall provide fall and spring pulse flows in the Bear River downstream of the Project described in this condition.

- SSWD Proposed Condition AR3, Implement Ramping Rates. SSWD shall make a good-faith effort to adhere to the target ramping rates in the Bear River downstream of the Project described in this condition.
- SSWD Proposed Condition TR1, Implement a Bald Eagle Management Plan. SSWD shall implement the Bald Eagle Management Plan included in Appendix E2 in Exhibit E of this Application for New License.
- SSWD proposed Condition TR2, Implement Blue Heron Rookery Management. SSWD shall implement a Limited Operating Period within a buffer of any great blue heron (*Ardea herodias*) rookeries located on Camp Far West Reservoir.
- SSWD Proposed Condition RR1, Implement Recreation Facilities Plan. SSWD shall implement the Recreation Facilities Plan included in Appendix E2 in Exhibit E of this Application for New License.
- SSWD Proposed Condition CR1, Implement Historic Properties Management Plan. SSWD shall implement the Historic Properties Management Plan included in Volume 3 of SSWD's Application for New License.

Refer to Appendix E2 in Exhibit E for the full text of each measure.

7.1.3 Changes to Measures in Other Licenses, Agreements and Contracts that Affect Operations

Section 5.2 describes other licenses (i.e., not the FERC license), agreements and contracts that affect current Project operations. When FERC issues its new license, SSWD would apply to the SWRCB to modify any water rights, if necessary, to make them consistent with the new license. SSWD does not anticipate any changes will be needed to SSWD's water delivery contracts. In addition, as described in Section 8, upon termination of the existing SSWD/SMUD Contract, SSWD plans to negotiate a new lease/power purchase contract or multiple contracts with, at this time, an unknown third party, which could be SMUD, or other parties.

7.1.4 Changes to Other Operating Constraints

Section 4.3 describes other current operating constraints. SSWD may continue to make water transfers, when possible, and will abide by the requirements, which are unknown at this time, in a new power purchase contract.

7.2 Changes in Project Operations with the Proposed Project

7.2.1 Near-Term Condition

The following sections describe project operations, water supply, and power generation results from the Ops Model (Baseline) with the Proposed Project. Results are presented as comparisons to the No Action Alternative Ops Model simulation.

Table 7.2-1. Average annual results by WY Type from WY 1976 through WY 2014 for the No Action Alternative (Baseline) and the Proposed Project (Near-Term Condition), and the difference between the two.

Water Year Type[1]	SSWD Diversions for Water Supply (ac-ft)	Camp Far West Reservoir Carryover Storage[2] (ac-ft)	Peak Project Energy Generation (MWhr)	Off-Peak Project Energy Generation (MWhr)	Total Project Energy Generation (MWhr)	Mean Flow Downstream of Non-Project Diversion Dam (cfs)
NO ACTION ALTERNATIVE (BASELINE CONDITION)						
Wet	109,600	39,700	14,375	22,780	37,155	826
Above Normal	109,000	23,600	11,722	18,584	30,306	365
Below Normal	100,500	14,500	8,321	13,164	21,485	178
Dry	53,700	13,000	2,138	3,378	5,515	42
Critical	19,200	5,400	412	650	1,062	15
All	**82,900**	**20,800**	**7,888**	**12,493**	**20,381**	**309**
PROPOSED PROJECT (NEAR-TERM CONDITION)						
Wet	110,000	48,000	14,829	23,500	38,329	832
Above Normal	110,000	31,700	11,872	18,824	30,696	357
Below Normal	105,300	20,300	8,537	13,505	22,042	166
Dry	54,700	12,600	2,091	3,303	5,394	44
Critical	18,900	4,500	416	657	1,072	18
All	**84,500**	**25,500**	**8,059**	**12,765**	**20,824**	**307**
DIFFEERNCE BETWEEN PROPOSED PROJECT AND NO ACTION ALTERNATIVE						
Wet	400	8,300	454	720	1,174	6
Above Normal	1,000	8,100	150	240	390	-8
Below Normal	4,800	5,800	216	341	557	-12
Dry	1,000	-400	-47	-75	-121	2
Critical	-300	-900	4	7	10	3
All	**1,600**	**4,700**	**171**	**272**	**443**	**-2**

[1] For this summary, SSWD used the WY types in FERC's FEIS for the YB/DS Projects. Simulated WY types were as described in SSWD Proposed Condition WR1 in Appendix E2 in Exhibit E of SSWD's Application for New License.

[2] Carryover storage is reservoir storage on October 31, carried over into the following year.

The Proposed Project (Near-Term Condition) creates additional storage space in Camp Far West Reservoir. The additional storage space allows more water to be stored when Camp Far West Reservoir fills and spills. Additional stored water may be delivered for water supply in the year when it is stored, or carried over for water supply and downstream demands in future years.

The additional storage space created by the Proposed Project (Near-Term Condition) also increases annual water supply deliveries to SSWD. The greatest water supply benefit occurs in Below Normal WYs when more than 4,000 ac-ft of water may be available annually (an additional 4% of total canal demand), as compared to the No Action Alternative. The additional water supply created by the additional storage space offsets the water supply impacts created by the proposed minimum streamflows and pulse flow requirements.

The mean streamflow downstream of the non-Project diversion dam is largely unchanged between the Proposed Project (Near-Term Condition) and the No Action Alternative. While the increased storage space under the Proposed Project (Near-Term Condition) does reduce the average annual spill from the reservoir, the minimum streamflow and pulse flow requirements proposed by SSWD for inclusion in the new license require larger volumes of water to be released downstream of the non-Project diversion dam in most WY types. As such, mean

streamflows downstream of the non-Project diversion dam are largely unchanged between the No Action Alternative and the Proposed Project (Near-Term Condition).

Average annual Project power generation increases by 443 MWhrs, with the largest increases occurring in Wet WYs.

Each of these results is discussed in more detail below.

7.2.1.1 Camp Far West Reservoir

Figure 7.2-1 is a comparison of modeled storage in Camp Far West Reservoir throughout the simulation period under the No Action Alternative and the Proposed Project (Near-Term Condition). The figure demonstrates that storage in Camp Far West is often greater under the Proposed Project, and that the maximum possible storage is 9,836 ac-ft greater. The reservoir is typically higher in wetter years, when additional water can be stored under the Proposed Project (Near-Term Condition). The reservoir is often lower in drier years, when additional water is required to be released to meet increased minimum streamflow requirements.

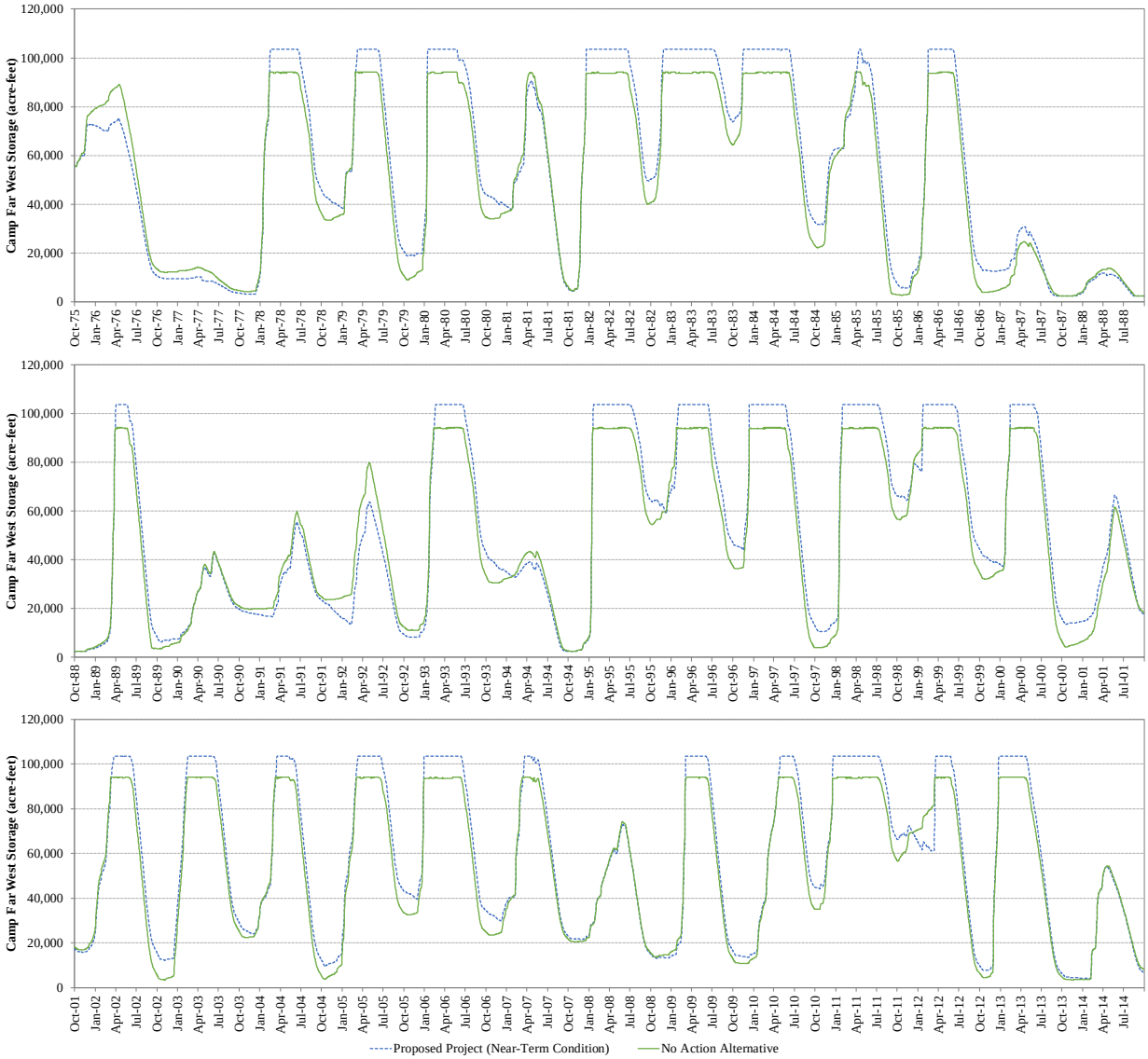

Figure 7.2-1. Comparison of Camp Far West Reservoir storage from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition).

Table 7.2-2 shows minimum, average, and maximum elevations in Camp Far West Reservoir under the Proposed Project (Near-Term Condition) during the representative dry, normal, and wet Wys.

Table 7.2-2. Minimum and maximum elevations in Camp Far West Reservoir in the representative dry, normal and wet Water Years from WY 1976 through WY 2014 under SSWD's Proposed Project (Near-Term Condition).

Water Year	Minimum Daily Elevation (ft)	Average Daily Elevation (ft)	Maximum Daily Elevation (ft)	Annual Elevation Fluctuation (ft)
2001 (Dry Year)	228.1	249.2	284.0	55.9
2003 (Normal Year)	225.1	275.4	305.0	79.9
1995 (Wet Year)	187.9	272.1	305.0	117.1

Under the Proposed Project (Near-Term Condition), carryover storage is higher in most years, particularly wetter years, than it would be under the No Action Alternative. Figure 7.2-2 shows an exceedance plot of modeled carryover storage under the Proposed Project (Near-Term Condition) and the No Action Alternative. Carryover storage is 4,700 ac-ft higher on average.

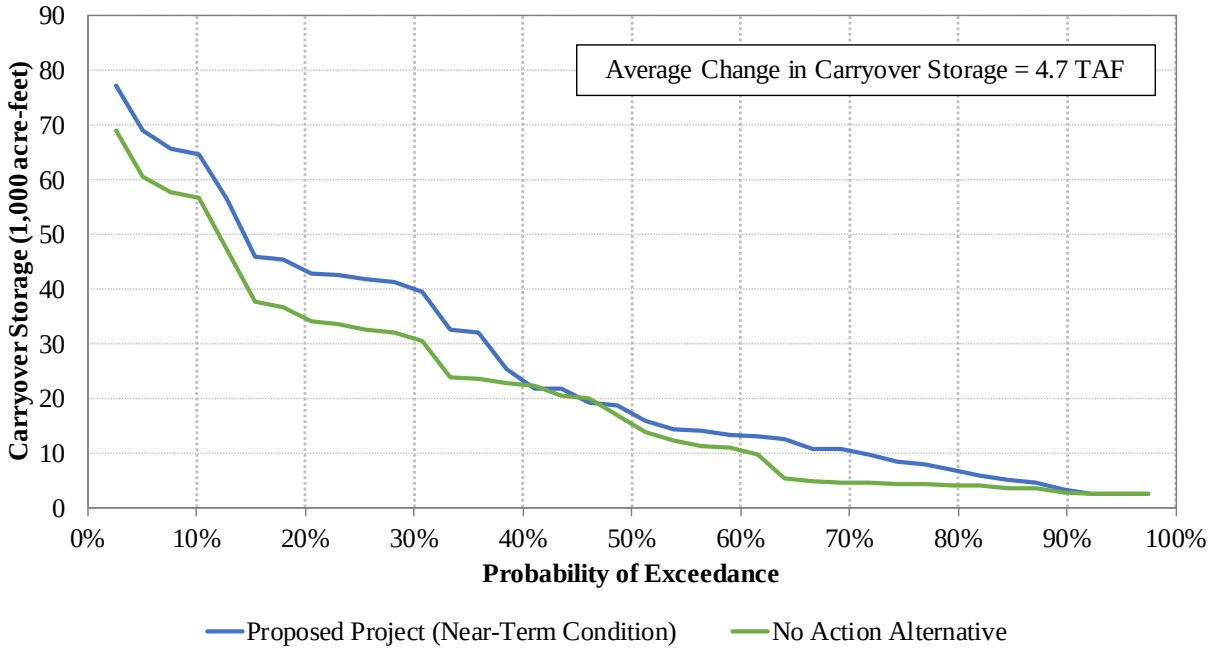

Figure 7.2-2. Comparison of Camp Far West Reservoir carryover storage probability of exceedance from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition).

Typical reservoir operations are largely unaffected by the increase in available storage under the Proposed Project (Near-Term Condition). Reservoir storage is often higher, although the reservoir often fills slightly later in the year given the increased minimum flow requirements in the fall under the new license. However, the reservoir's fill and drawdown pattern is essentially identical to the No Action Alternative. Figure 7.2-3 shows maximum, mean, median, and minimum daily storage for Camp Far West Reservoir under the Proposed Project (Near-Term Condition) and the No Action Alternative.

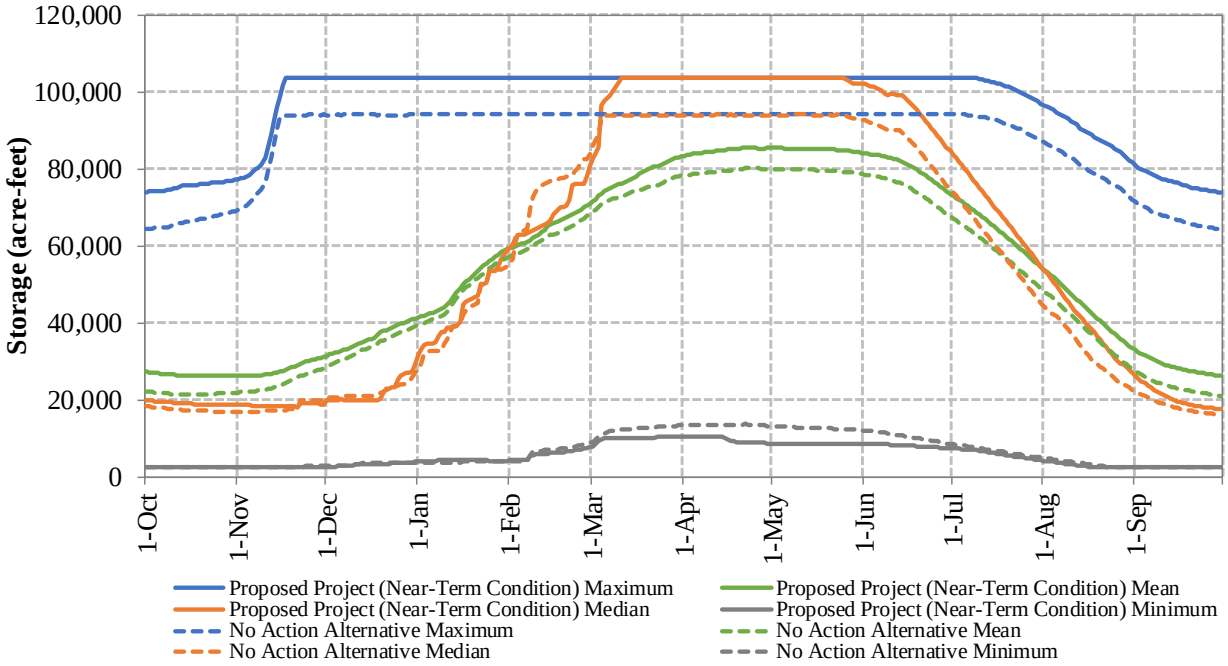

Figure 7.2-3. Maximum, mean, median, and minimum daily Camp Far West Reservoir storage levels from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition).

7.2.1.2 Water Supply

Figure 7.2.1-5 illustrates annual water supply delivery to SSWD under the Proposed Project (Near-Term Condition) and the No Action Alternative (Baseline Condition), along with annual SSWD canal demand, which is 110,000 ac-ft. The figure shows increases in SSWD deliveries in most years, and decreases in some Dry and Critical years. Under the Proposed Project (Near-Term Condition), SSWD receives a full allocation in more than 50 percent of years, as compared to approximately 40 percent of years under the No Action Alternative. On average, approximately 1,600 ac-ft of additional water is delivered annually to SSWD.

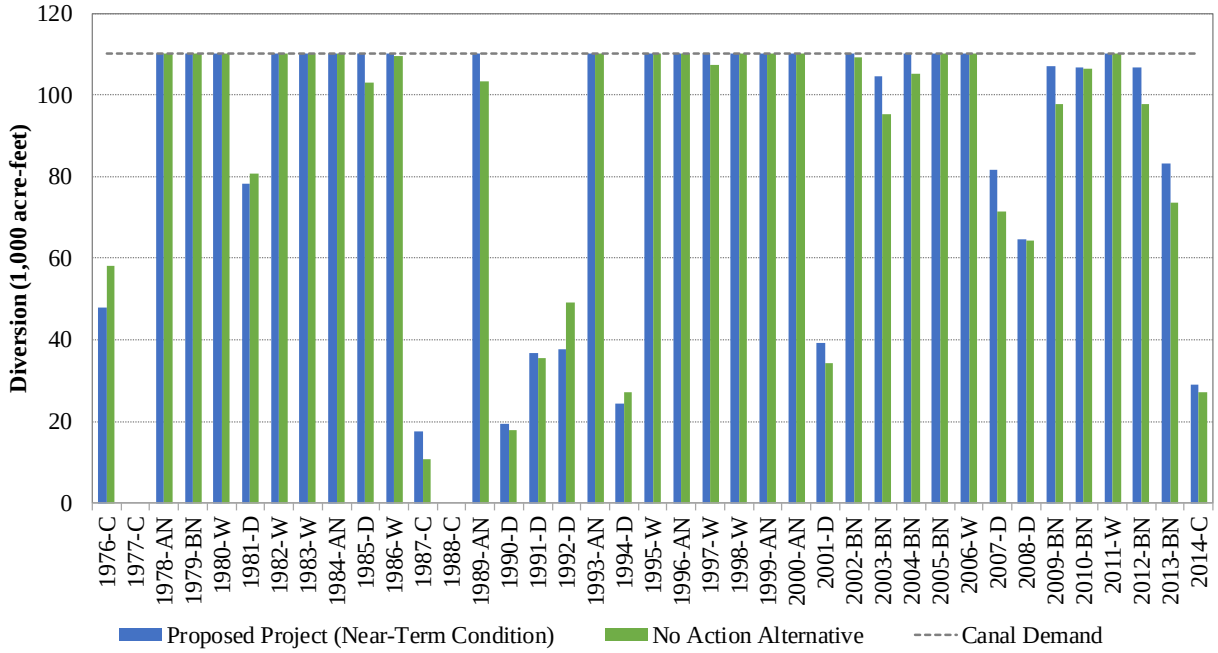

Figure 7.2-4. Comparison of annual water supply diversions to SSWD from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition).

7.2.1.3 Camp Far West Powerhouse

The Proposed Project (Near-Term Condition) would not affect the existing Camp Far West Powerhouse capability curve, which is shown in Figure 6.2-8, or the Camp Far West Powerhouse tailwater-rating curve, which is shown in Figure 6.2-9. Figure 7.2-5 shows modeled daily (by month and over the simulation period) flow duration curves through the Camp Far West Powerhouse under the Proposed Project (Near-Term Condition). There is a slightly greater probability of higher flows in most months, as compared to the No Action Alternative.

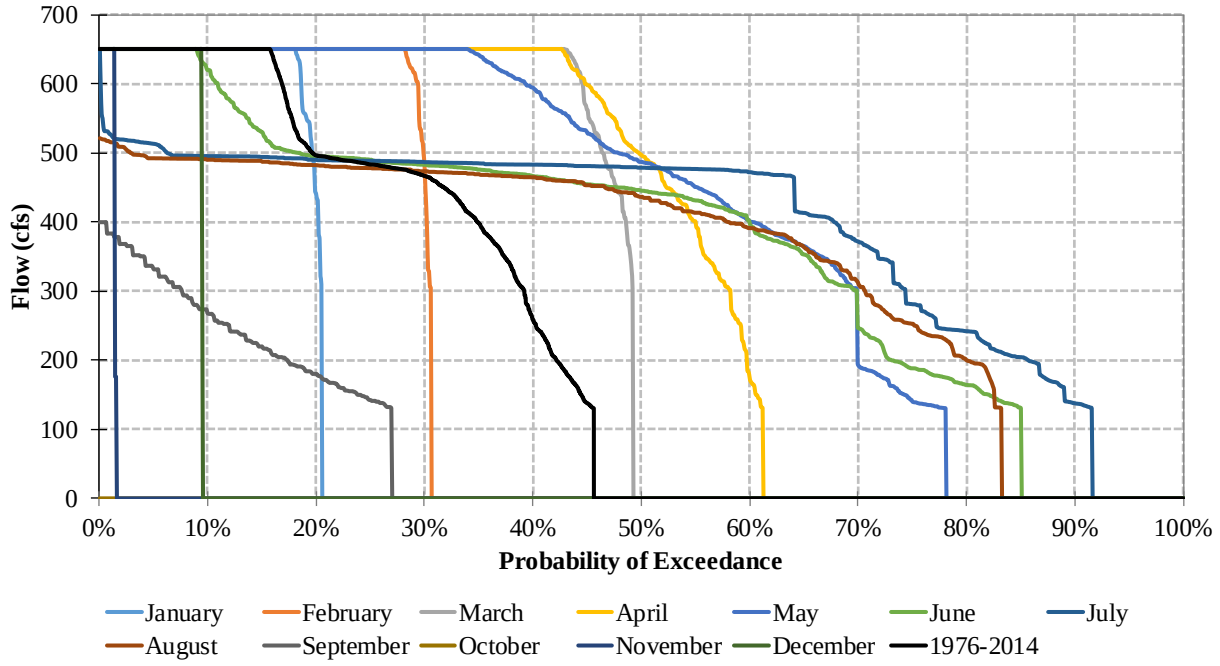

Figure 7.2-5. Modeled daily (by month and over the simulation period) flow duration curves for Camp Far West Powerhouse from WY 1976 through WY 2014 under SSWD's Proposed Project (Near-Term Condition).

Camp Far West Powerhouse would have generated an average of 20,824 MWh/yr from 1976 to 2014 under SSWD's Proposed Project (Near-Term Condition). The average annual plant factor for the powerhouse for this period is 0.35 based on the annual generation divided by the plant nameplate generating capability (6.8 MW) times the number of hours per year. Annual gross generation and plant factors for the powerhouse are provided in Table 7.2-3.

Table 7.2-3. Annual generation and plant factors for Camp Far West Powerhouse from WY 1976 through WY 2014 under SSWD's Proposed Project (Near-Term Condition).

Water Year	Annual Generation (aMW)	Annual Generation (MWh)	Plant Capability (MWh)	Plant Factor
1976	0.3	2,835	59,731	0.05
1977	0.0	0	59,568	0.00
1978	3.4	29,999	59,568	0.50
1979	2.8	24,393	59,568	0.41
1980	3.9	34,656	59,731	0.58
1981	0.8	6,798	59,568	0.11
1982	4.7	41,447	59,568	0.70
1983	5.3	46,520	59,568	0.78
1984	5.0	43,953	59,731	0.74
1985	1.7	14,456	59,568	0.24
1986	3.3	29,006	59,568	0.49
1987	0.1	505	59,568	0.01
1988	0.0	0	59,731	0.00

Table 7.2-3. (continued)

Water Year	Annual Generation (aMW)	Annual Generation (MWh)	Plant Capability (MWh)	Plant Factor
1989	2.2	18,896	59,568	0.32
1990	0.1	887	59,568	0.01
1991	0.3	3,002	59,568	0.05
1992	0.3	2,491	59,731	0.04
1993	3.6	31,254	59,568	0.52
1994	0.2	1,335	59,568	0.02
1995	4.2	37,183	59,568	0.62
1996	3.8	33,166	59,731	0.56
1997	4.3	37,845	59,568	0.64
1998	4.1	35,760	59,568	0.60
1999	3.7	32,248	59,568	0.54
2000	3.4	30,095	59,731	0.50
2001	0.3	2,938	59,568	0.05
2002	2.4	21,446	59,568	0.36
2003	3.0	26,047	59,568	0.44
2004	2.4	21,433	59,731	0.36
2005	2.9	25,618	59,568	0.43
2006	4.5	39,245	59,568	0.66
2007	1.1	9,529	59,568	0.16
2008	0.6	4,923	59,731	0.08
2009	2.6	22,655	59,568	0.38
2010	2.0	17,757	59,568	0.30
2011	5.0	43,426	59,568	0.73
2012	2.3	20,149	59,731	0.34
2013	1.8	16,198	59,568	0.27
2014	0.2	2,023	59,568	0.03
Total	**92.6**	**812,119**	--	--
Minimum	**0.0**	**0**	--	**0.00**
Average	**2.4**	**20,824**	--	**0.35**
Median	**2.4**	**21,446**	--	**0.36**
Maximum	**5.3**	**46,520**	--	**0.78**

Key: aMW = annual megawatt; MWh = megawatt-hour

Average annual power generation increases by 443 MW hrs under the Proposed Project (Near-Term Condition), as shown in Figure 7.2-6. Most of this increase occurs during April through August, as reservoir storage is often higher under the Proposed Project (Near-Term Condition), leading to greater head and thus increased power production.

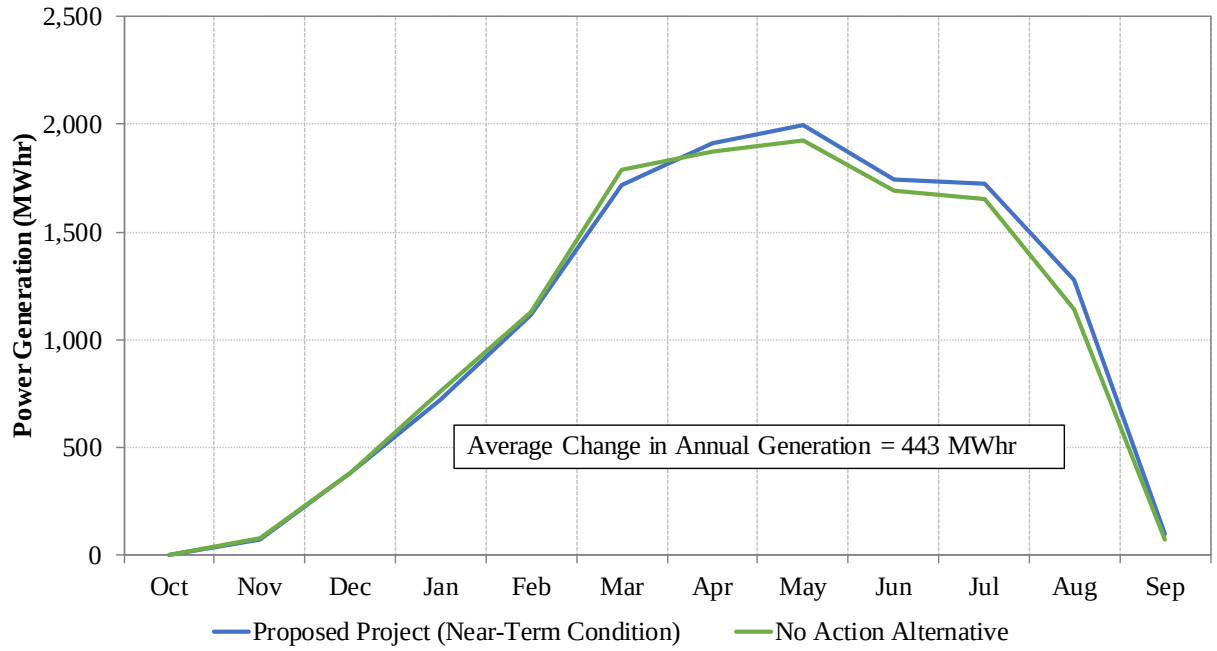

Figure 7.2-6. Comparison of average monthly power production from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition).

7.2.1.4 Flows in the Bear River Downstream of the Project

7.2.1.4.1 Bear River Fish Release below the non-Project Diversion Dam

Figure 7.2-7 is a comparison of flow below the non-Project diversion dam throughout the simulation period under the Proposed Project and the No Action Alternative. The difference in flow downstream of the non-Project diversion dam between the two alternatives can be substantial given the change in minimum streamflow and the pulse flows under SSWD's Proposed Project, and the delay in spills resulting from the increased storage capability under the Proposed Project (Near-Term Condition). Flows between the two alternatives are most often different in the fall months of most years, and in the spring of Dry WYs. Flows are frequently higher under the Proposed Project (Near-Term Condition), but can be lower for shorter periods of time. Changes in reservoir storage under the Proposed Project (Near-Term Condition) also result in some differences in the volume and frequency of Bear River Agreement releases. Overall, annual average flow below the non-Project diversion dam is 1,800 ac-ft less under the Proposed Project (Near-Term Condition).

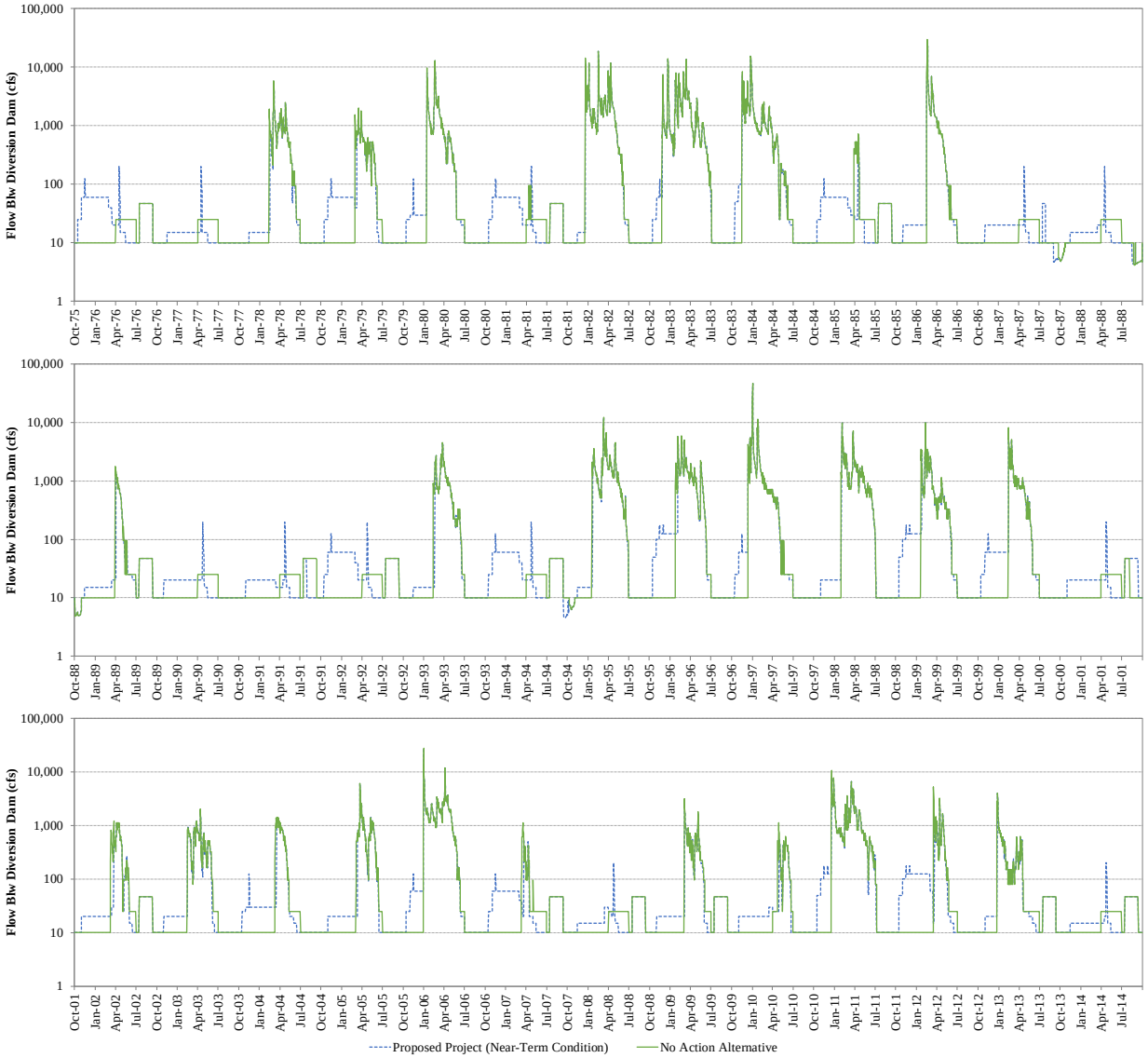

Figure 7.2-7. Comparison of flows in the Bear River downstream of the non-Project diversion dam from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 7.2-8 shows modeled daily, by month and over the simulation period, flow duration curves for the Bear River below the non-Project diversion dam under the Proposed Project (Near-Term Condition). Results are noticeably different from the average monthly streamflow below the non-Project diversion dam under the No Action Alternative, largely a result of the changes to the required minimum streamflows and the addition of pulse flows under the Proposed Project (Near-Term Condition).

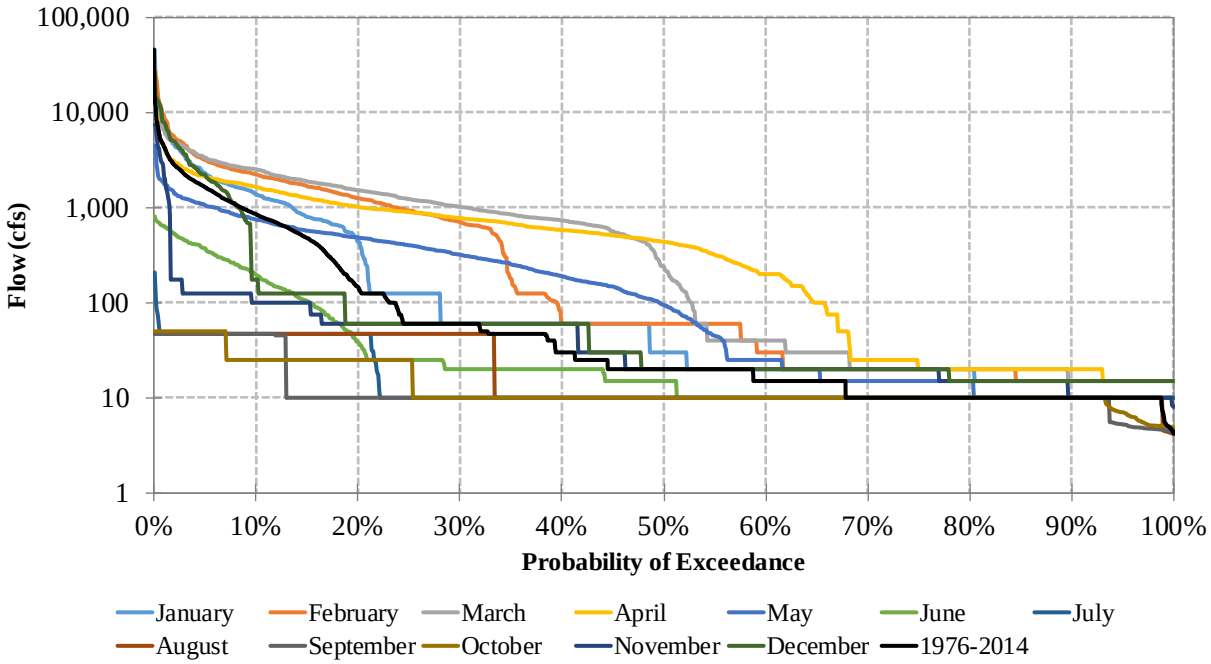

Figure 7.2-8. Modeled daily (by month and over the simulation period) flow duration curves below the non-Project diversion dam from WY 1976 through WY 2014 under SSWD's Proposed Project (Near-Term Condition). Flow is plotted in logarithmic scale to better show both high and low values.

7.2.1.4.2 Bear River Near Wheatland

The differences in Bear River flow near Wheatland between the No Action Alternative and the Proposed Project (Near-Term Condition) are noticeable, with similar differences as discussed in Section 7.2.1.4.1. Figure 7.2-9 shows a comparison of daily-modeled streamflow for the Bear River near Wheatland between the No Action Alternative and the Proposed Project (Near-Term Condition). Differences are largely the result of the changes to required minimum streamflows and the addition of pulse flows below the non-Project diversion dam under the Proposed Project (Near-Term Condition), as well as the additional storage space capturing more inflow and delaying peak downstream flow during storm events.

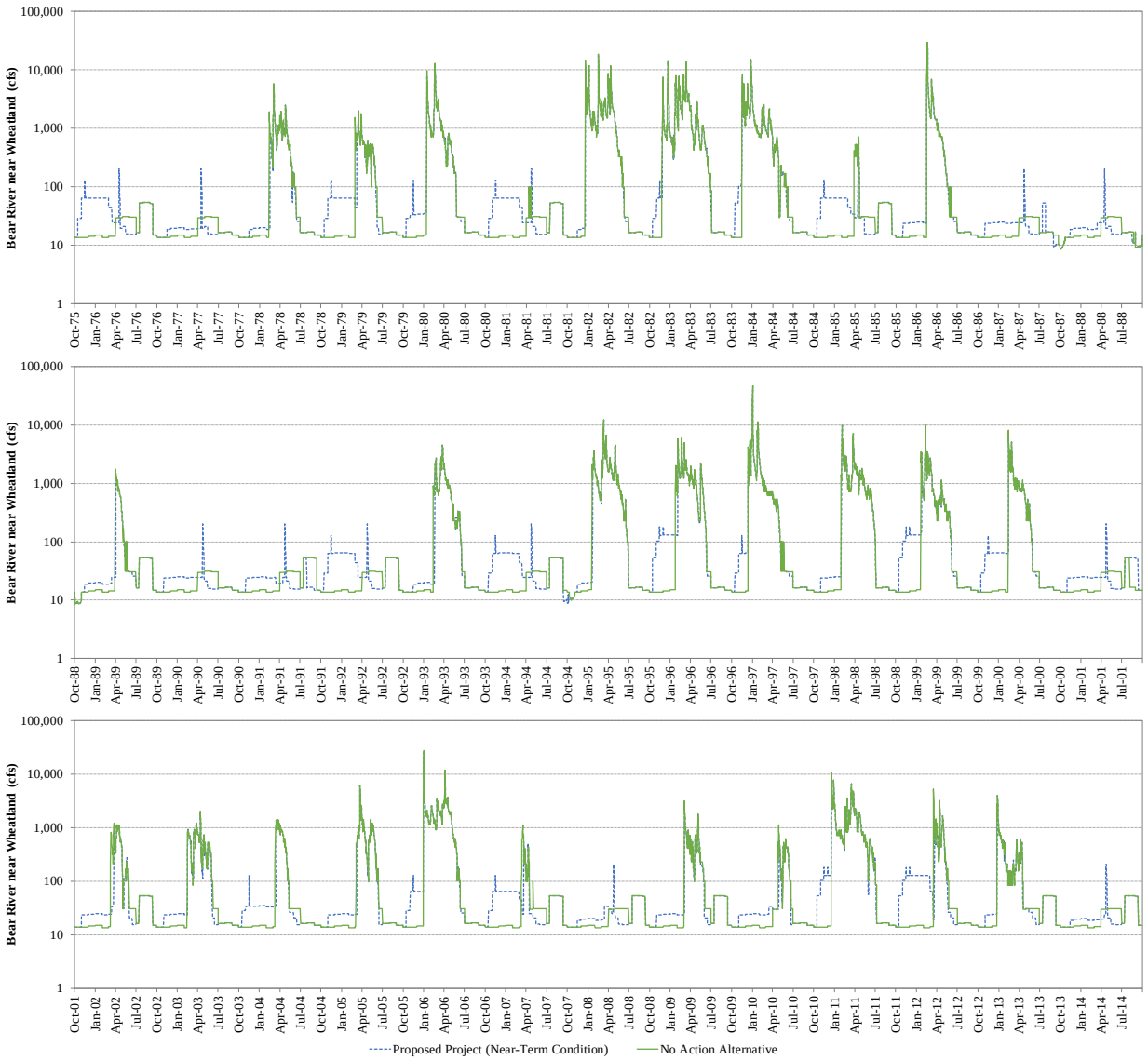

Figure 7.2-9. Comparison of flows in the Bear River near Wheatland from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 7.2-10 shows modeled daily, by month and over the simulation period, flow duration curves for the Bear River near Wheatland under the Proposed Project (Near-Term Condition). Results are noticeably different in the magnitude and probability of average monthly streamflow below the non-Project diversion dam compared to those seen under the No Action Alternative.

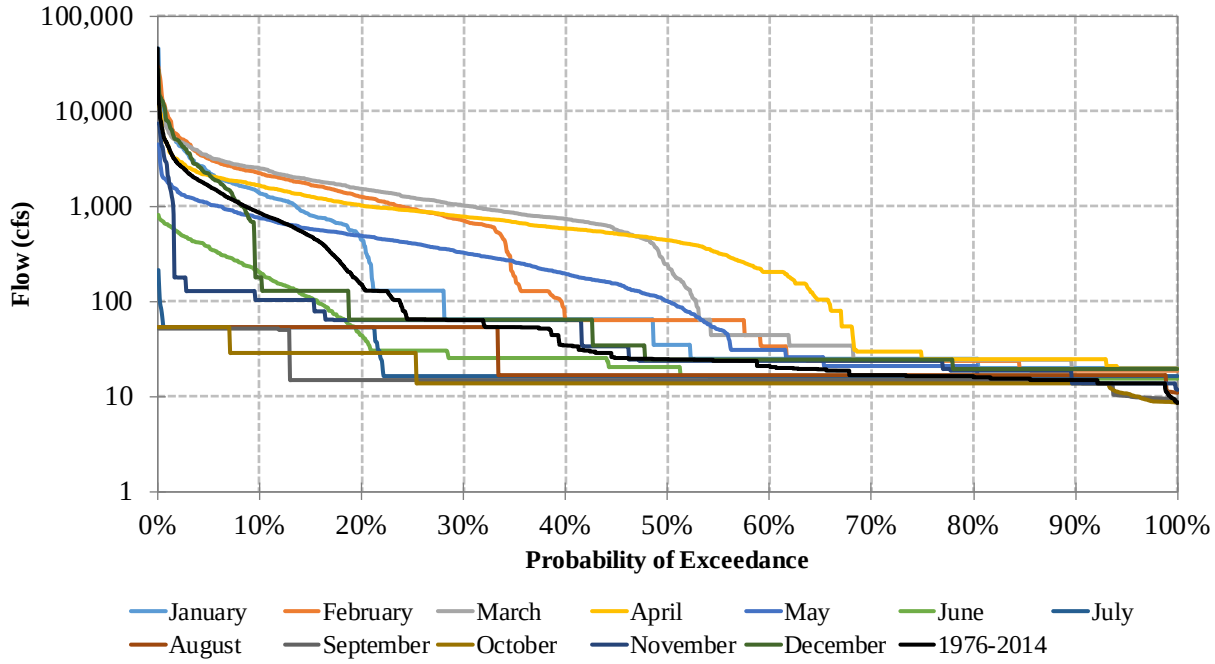

Figure 7.2-10. Modeled daily (by month and over the simulation period) flow duration curves for the Bear River near Wheatland from WY 1976 through WY 2014 under SSWD's Proposed Project (Near-Term Condition). Flow is plotted in logarithmic scale to better show both high and low values.

7.2.1.4.3 Bear River at Confluence with Feather River

Differences between flows in the Bear River at the Feather River confluence under the Proposed Project (Near-Term Condition), as compared to the No Action Alternative, are again noticeable. Changes in flow magnitude and timing are nearly identical to those seen in Figure 7.2-7 and Figure 7.2-9, although not as noticeable, given the influence from Dry Creek inflows.

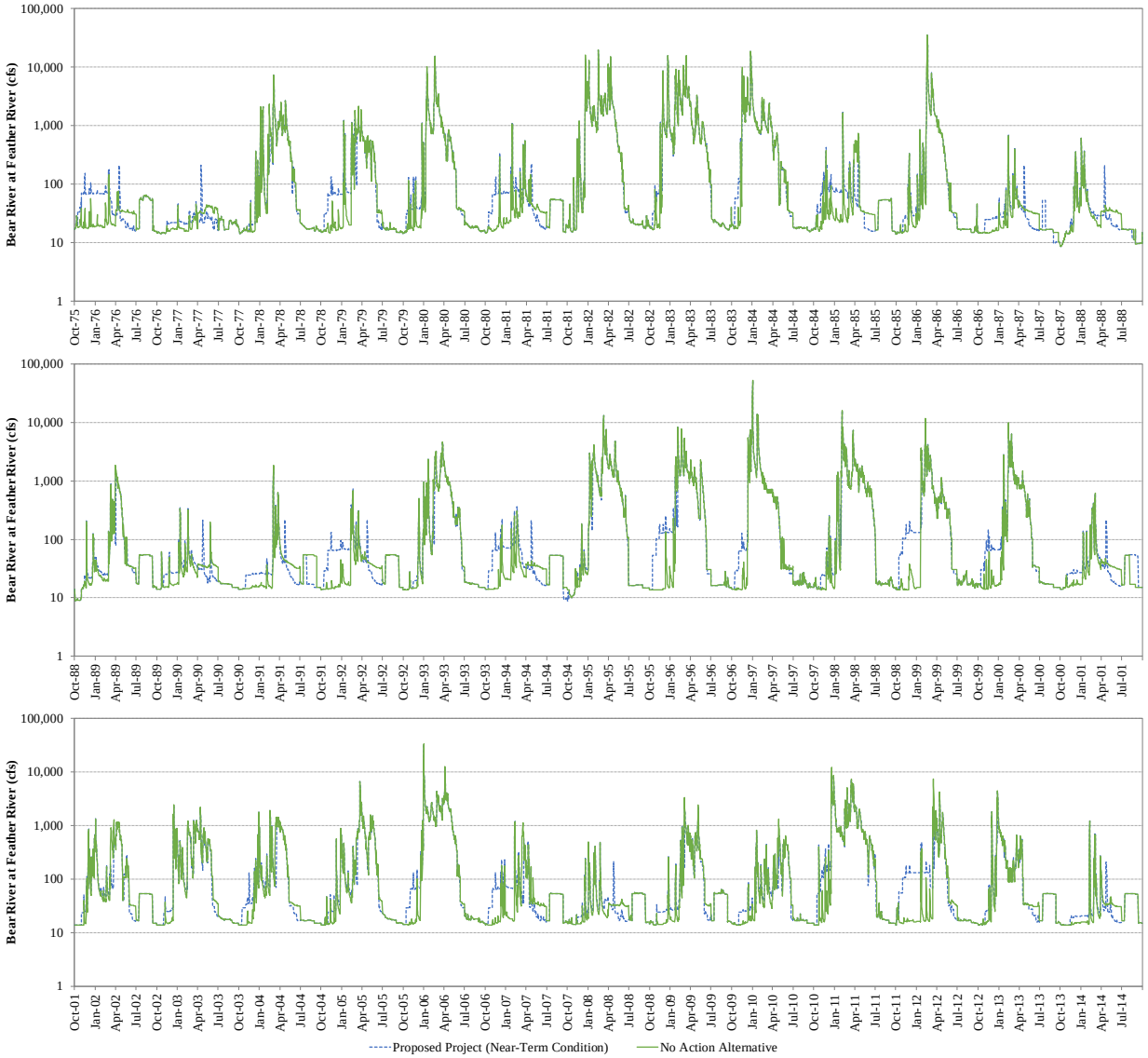

Figure 7.2-11. Comparison of flows in the Bear River at the Feather River confluence from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Near-Term Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 7.2-12 shows modeled flow exceedance curves of the average monthly streamflow for the Bear River at the Feather River confluence under the Proposed Project (Near-Term Condition).

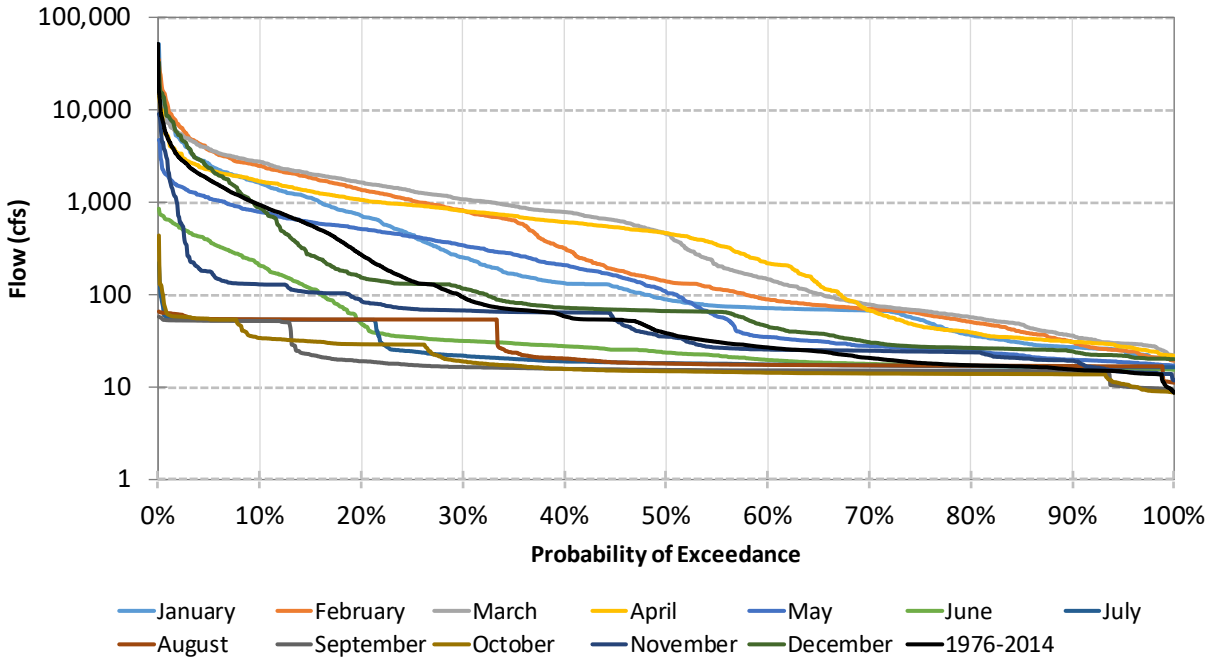

Figure 7.2-12. Modeled daily (by month and over the simulation period) flow duration curves for the Bear River at the Feather River confluence from WY 1976 through WY 2014 under SSWD's Proposed Project (Near-Term Condition). Flow is plotted in logarithmic scale to better show both high and low values.

7.2.2 Future Conditions

The following sections describe Project operations, water supply, and power generation results from the Ops Model under the Proposed Project (Future Condition). Results are presented as comparisons to the No Action Alternative (Baseline) Ops Model simulation.

Table 7.2-4. Average annual results from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Future Condition), and the difference between the two.

Water Year Type[1]	SSWD Diversions for Water Supply (ac-ft)	Camp Far West Reservoir Carryover Storage[2] (ac-ft)	Peak Project Energy Generation (MWhr)	Off-Peak Project Energy Generation (MWhr)	Total Project Energy Generation (MWhr)	Mean Flow Downstream of Non-Project Diversion Dam (cfs)
NO ACTION ALTERNATIVE (BASELINE CONDITION)						
Wet	109,600	39,700	14,375	22,780	37,155	826
Above Normal	109,000	23,600	11,722	18,584	30,306	365
Below Normal	100,500	14,500	8,321	13,164	21,485	178
Dry	53,700	13,000	2,138	3,378	5,515	42
Critical	19,200	5,400	412	650	1,062	15
All	**82,900**	**20,800**	**7,888**	**12,493**	**20,381**	**309**

Table 7.2-4. (continued)

Water Year Type[1]	SSWD Diversions for Water Supply (ac-ft)	Camp Far West Reservoir Carryover Storage[2] (ac-ft)	Peak Project Energy Generation (MWhr)	Off-Peak Project Energy Generation (MWhr)	Total Project Energy Generation (MWhr)	Mean Flow Downstream of Non-Project Diversion Dam (cfs)
PROPOSED PROJECT (FUTURE CONDITION)						
Wet	109,600	34,600	14,348	22,738	37,086	782
Above Normal	109,400	21,200	11,049	17,518	28,567	316
Below Normal	103,100	17,000	7,169	11,341	18,510	120
Dry	39,300	6,300	1,237	1,954	3,191	32
Critical	15,100	4,200	344	543	887	18
All	**79,700**	**18,100**	**7,278**	**11,529**	**18,807**	**274**
DIFFERENCE BETWEEN THE PROPOSED PROJECT AND NO ACTION ALTERNATIVE						
Wet	0	-5,100	-27	-42	-69	-44
Above Normal	400	-2,400	-673	-1,066	-1,739	-49
Below Normal	2,600	2,500	-1,152	-1,823	-2,975	-58
Dry	-14,400	-6,700	-901	-1,424	-2,324	-10
Critical	-4,100	-1,200	-68	-107	-175	3
All	**-3,200**	**-2,700**	**-610**	**-964**	**-1,574**	**-35**

[1] For this summary, SSWD used the WY types in FERC's FEIS for the YB/DS Projects. Simulated WY types were as described in SSWD Proposed Condition WR1 in Appendix E2 in Exhibit E of SSWD's Application for New License.

[2] Carryover storage is reservoir storage on October 31, carried over into the following year.

The Proposed Project creates additional storage space in Camp Far West Reservoir, which allows the reservoir to somewhat compensate for the decrease in available water supply to SSWD caused by the reduced reservoir inflow under the Future Condition hydrology.

The additional storage space created by the Proposed Project creates marginal effects to annual water supply diversions in Above and Below Normal WYs. However, average annual water supply is reduced by 3,200 ac-ft, largely a result of the reduced inflow in Dry and Critical WYs and the increase in required minimum flows and the addition of pulse flows downstream of the non-Project diversion dam in most WY types under the new license. The greatest water supply impact occurs in Dry WYs, when annual water supply diversions are reduced by more than 14,000 ac-ft .

The additional storage space reduces the average annual spill from the reservoir, which along with the increased minimum flow requirements and pulse flows, reduces the average annual flows below the non-Project diversion dam in all but the driest WYs. As compared to the No Action Alternative (Baseline Condition), average annual flows decrease by 35 cfs.

Average annual power generation decreases by 1,574 MWhrs as compared to the No Action Alternative (Baseline Condition). Power generation decreases in all WY types.

Each of these results is discussed in more detail below.

7.2.2.1 Camp Far West Reservoir

The existing Camp Far West Dam spillway-rating curve, shown in Figure 6.2-5, would not change under the Proposed Project (Future Conditions). The Proposed Project (Future Condition) would increase the NMWSE of Camp Far West Reservoir to 305 ft. The area-

capacity curve for Camp Far West Reservoir with a NMWSE of 305 ft was previously discussed in Section 7.1.1.1.

Figure 7.2-13 is a comparison of modeled storage in Camp Far West Reservoir throughout the simulation period under the No Action Alternative (Baseline) and the Proposed Project (Future Condition). The figure demonstrates that storage in Camp Far West is often greater under the Proposed Project, and that the maximum possible storage is 9,836 ac-ft greater. The reservoir is generally higher in years when inflow is enough to fill the reservoir, but often lower in Dry and Critical WYs, when inflow under the future condition is lower and downstream minimum flow requirements are higher as compared to the No Action Alternative.

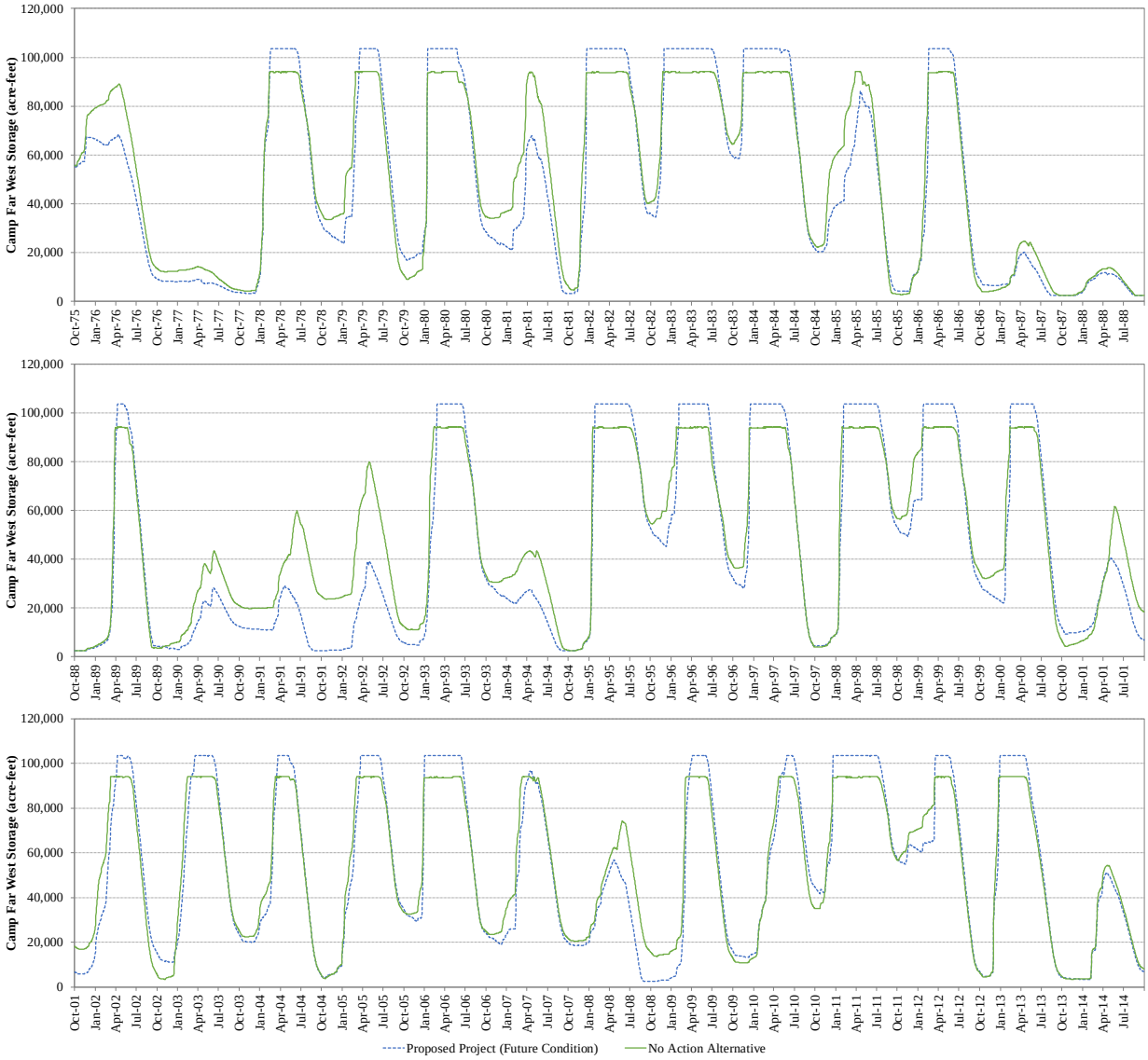

Figure 7.2-13. Comparison of Camp Far West Reservoir storage from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Future Condition).

Table 7.2-5 shows minimum, average, and maximum elevations in Camp Far West Reservoir under the Proposed Project (Future Condition) during the representative dry, normal, and wet WYs.

Table 7.2-5. Minimum and maximum elevations in Camp Far West Reservoir from WY 1976 through WY 2014 in the representative dry, normal and wet Water Years under SSWD's Proposed Project (Future Condition).

Water Year	Minimum Daily Elevation (ft)	Average Daily Elevation (ft)	Maximum Daily Elevation (ft)	Annual Elevation Fluctuation (ft)
2001 (Dry Year)	210.2	234.8	263.7	53.5
2003 (Normal Year)	222.4	270.0	305.0	82.6
1995 (Wet Year)	187.9	270.2	305.0	117.1

Carryover storage in the reservoir is lower in most years under the Proposed Project (Future Condition). Figure 7.2-14 shows an exceedance plot of modeled carryover storage under the Proposed Project (Future Condition) and the No Action Alternative (Baseline Condiiton). On average, carryover storage is 2,700 ac-ft lower. Under the Proposed Project (Future Condition), carryover storage reaches deadpool in approximately 10 percent of years.

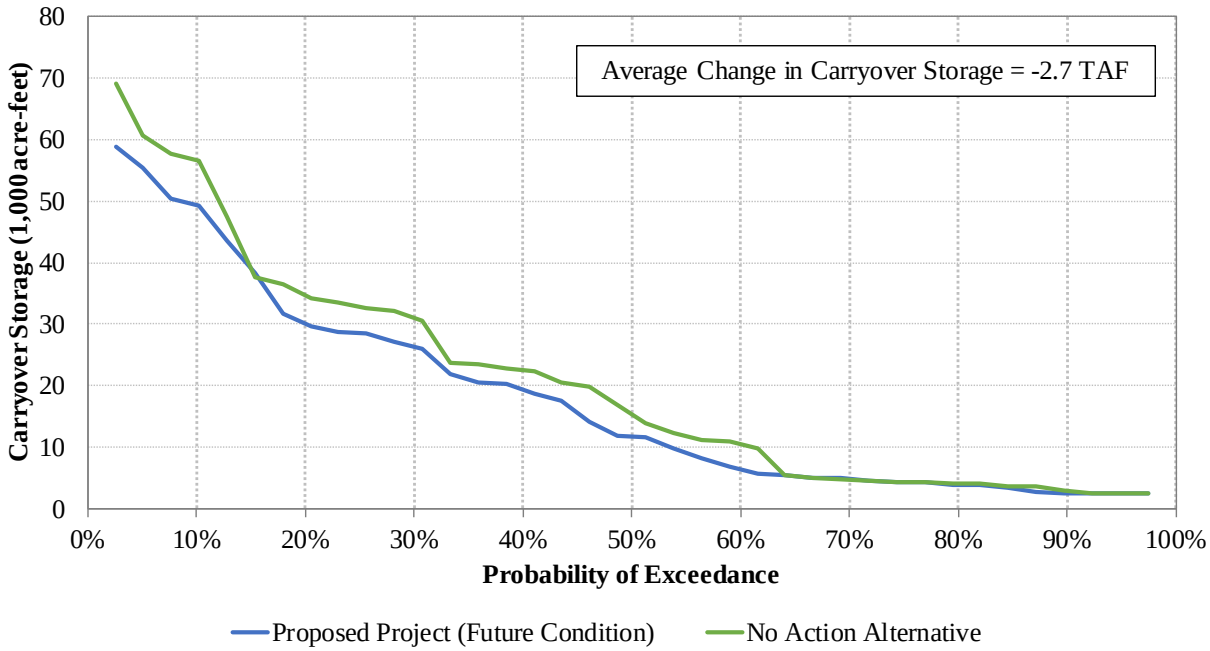

Figure 7.2-14. Comparison of Camp Far West Reservoir carryover storage probability of exceedance from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Future Condition).

Typical reservoir operations are largely unaffected by the increase in available storage under the Proposed Project (Future Condition). Reservoir storage is often higher in the spring months and lower in the fall months, largely a result of the reduced inflows under the Future Condition

hydrology and the increase in minimum flow requirements and required pulse flows below the non-Project diversion dam under the Proposed Project (Future Condition). However, the reservoir's fill and drawdown pattern is essentially identical to the No Action Alternative. Figure 7.2-15 shows maximum, mean, median, and minimum daily storage for Camp Far West under the Proposed Project (Future Condition) and the No Action Alternative (Baseline Condition).

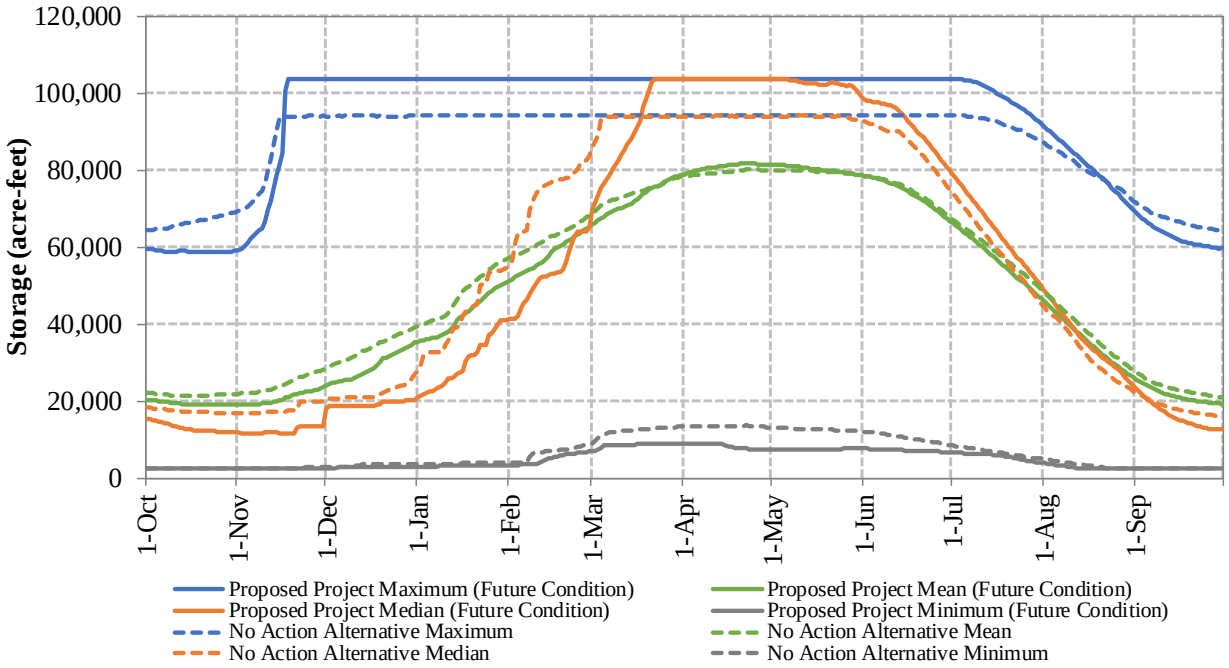

Figure 7.2-15. Maximum, mean, median, and minimum daily Camp Far West Reservoir storage levels from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Future Condition).

7.2.2.2 Water Supply

Figure 7.2-16 illustrates annual SSWD water supply diversions under the Proposed Project (Future Condition) and the No Action Alternative (Baseline Condition), along with annual SSWD canal demand. The figure shows decreases in SSWD diversions in many years, with increases in some Below Normal WYs. Under the Proposed Project (Future Condition), SSWD meets full canal demand in nearly the same percentage of years (i.e., approximately 40% of years) as the No Action Alternative (Baseline Condition). On average, annual SSWD diversions are reduced by 3,200 ac-ft.

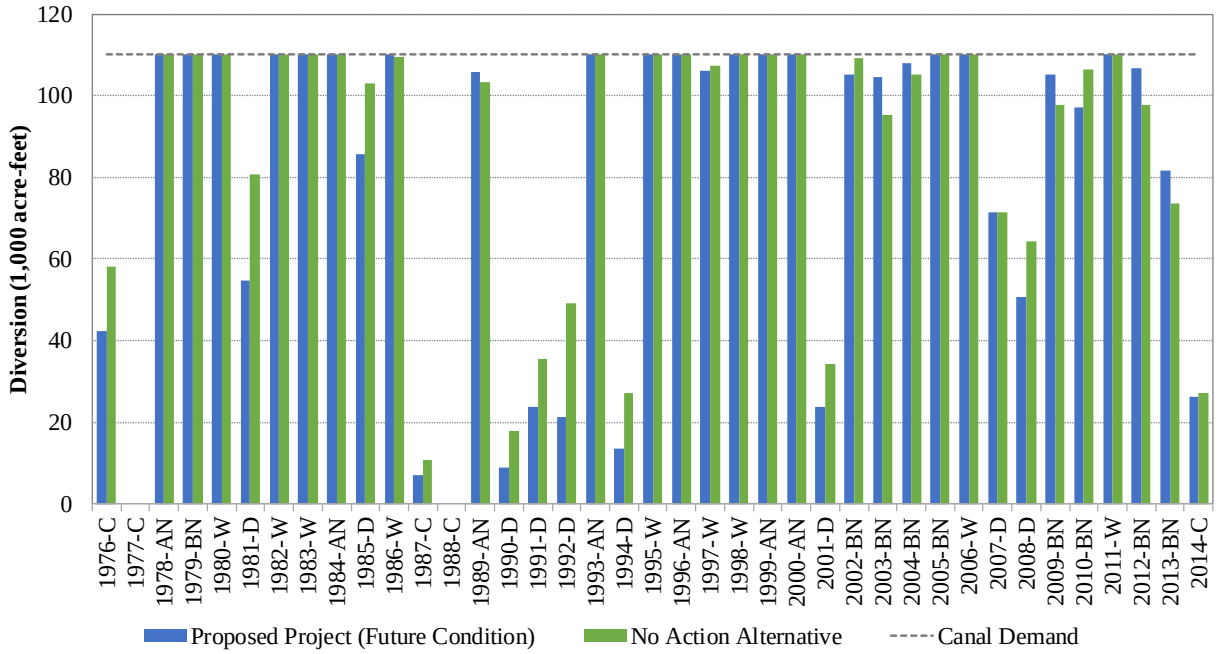

Figure 7.2-16. Comparison of annual water supply diversion to SSWD from WY 1976 through WY 2014 for the No Action Alternative (Baseline) and the Proposed Project (Future Condition).

7.2.2.3 Camp Far West Powerhouse

The Proposed Project (Future Condition) would not affect the existing Camp Far West Powerhouse capability curve, which is shown in Figure 6.2-7, or the Camp Far West Powerhouse tailwater-rating curve, which is shown in Figure 6.2-8. Figure 7.2-17 shows modeled daily, by month and over the simulation period, flow duration curves through the Camp Far West Powerhouse under the Proposed Project. Results indicate that flow is passed through the powerhouse in about 42 percent of days over the simulation period.

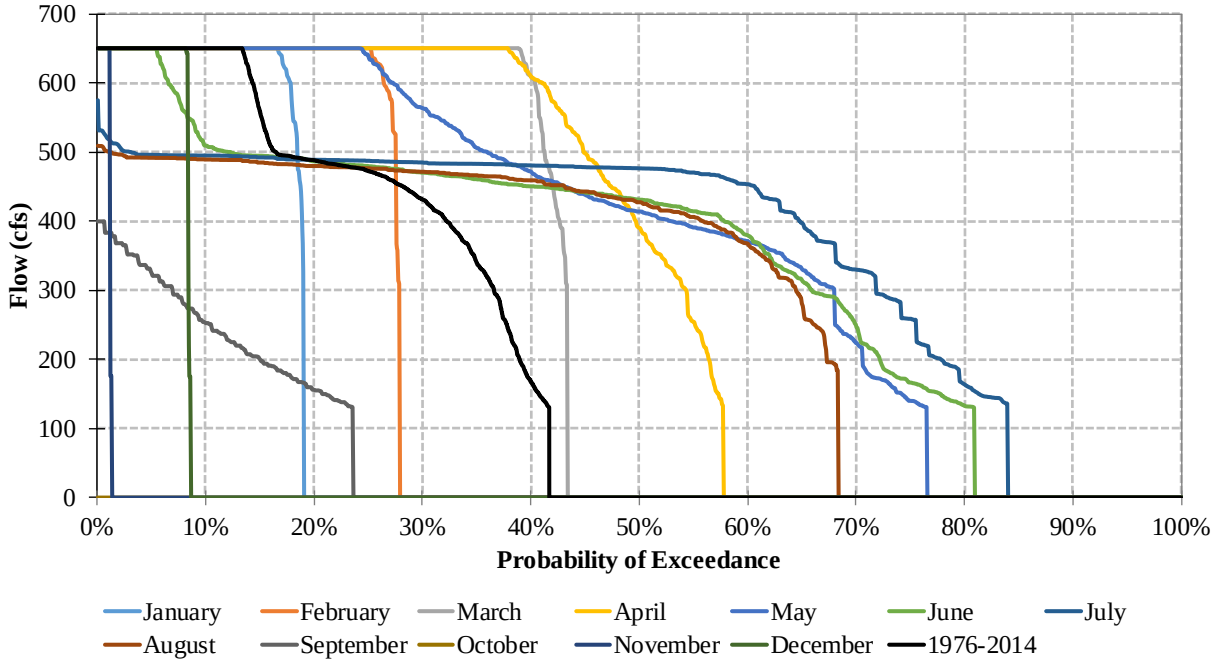

Figure 7.2-17. Modeled daily (by month and over the simulation period) flow duration curves for Camp Far West Powerhouse from WY 1976 through WY 2014 for SSWD's Proposed Project (Future Condition).

Camp Far West Powerhouse would have generated an average of 18,807 MWh/yr from 1976 to 2014 under SSWD's Proposed Project (Future Condition). The average annual plant factor for the powerhouse for this period is 0.32 based on the annual generation divided by the plant nameplate generating capability (6.8 MW) times the number of hours per year. Annual gross generation and plant factors for the powerhouse are provided in Table 7.2-6.

Table 7.2-6. Annual generation and plant factors for Camp Far West Powerhouse from WY 1976 through WY 2014 under SSWD's Proposed Project (Future Condition).

Water Year	Annual Generation (aMW)	Annual Generation (MWh)	Plant Capability (MWh)	Plant Factor
1976	0.3	2,652	59,731	0.04
1977	0.0	0	59,568	0.00
1978	3.2	28,361	59,568	0.48
1979	2.4	20,842	59,568	0.35
1980	3.8	33,368	59,731	0.56
1981	0.4	3,302	59,568	0.06
1982	4.6	40,587	59,568	0.68
1983	5.1	45,050	59,568	0.76
1984	4.8	41,748	59,731	0.70
1985	1.1	9,302	59,568	0.16
1986	3.1	27,193	59,568	0.46
1987	0.0	104	59,568	0.00
1988	0.0	0	59,731	0.00

Table 7.2-6. (continued)

Water Year	Annual Generation (aMW)	Annual Generation (MWh)	Plant Capability (MWh)	Plant Factor
1989	1.9	16,257	59,568	0.27
1990	0.0	89	59,568	0.00
1991	0.1	1,014	59,568	0.02
1992	0.1	761	59,731	0.01
1993	3.2	28,298	59,568	0.48
1994	0.0	123	59,568	0.00
1995	4.1	35,643	59,568	0.60
1996	3.7	32,149	59,731	0.54
1997	4.0	34,605	59,568	0.58
1998	4.0	35,070	59,568	0.59
1999	3.5	30,288	59,568	0.51
2000	3.2	28,517	59,731	0.48
2001	0.1	1,225	59,568	0.02
2002	2.0	17,091	59,568	0.29
2003	2.4	20,964	59,568	0.35
2004	2.2	19,422	59,731	0.33
2005	2.6	22,651	59,568	0.38
2006	4.4	38,461	59,568	0.65
2007	0.8	6,874	59,568	0.12
2008	0.5	4,020	59,731	0.07
2009	1.9	16,823	59,568	0.28
2010	1.6	14,033	59,568	0.24
2011	4.9	42,790	59,568	0.72
2012	2.2	18,909	59,731	0.32
2013	1.5	13,213	59,568	0.22
2014	0.2	1.677	59,568	0.03
Total	**83.7**	**733,478**	--	--
Minimum	**0.0**	**0**	--	**0.00**
Average	**2.1**	**18,807**	--	**0.32**
Median	**2.2**	**18,909**	--	**0.32**
Maximum	**5.1**	**45,050**	--	**0.76**

Key: aMW = annual megawatt; MWh = megawatt-hour

Average annual power generation decreases by 1,574 MWhrs under the Proposed Project (Future Condition), as shown in Figure 7.2-18. Most of this decrease occurs from January through May, as the reservoir takes longer to fill under the Proposed Project, and thus releases less water.

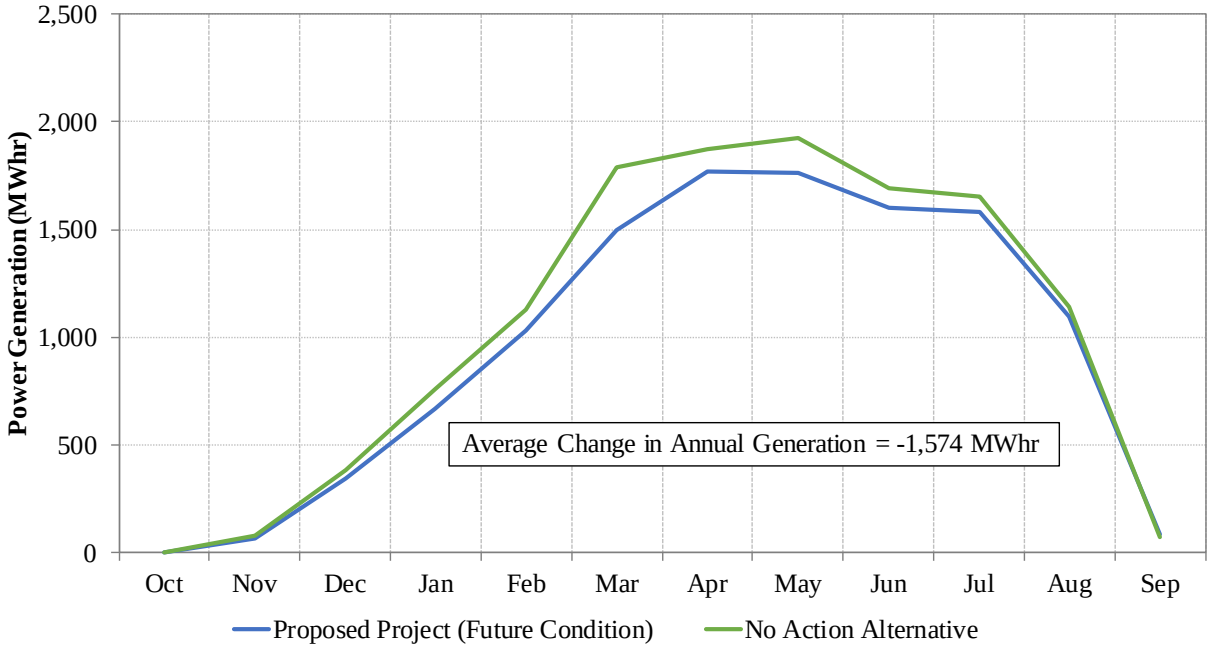

Figure 7.2-18. Comparison of average monthly power production from WY 1976 through WY 2014 for the No Action Alternative (Baseline) and the Proposed Project (Future Condition).

7.2.2.4 Flows in the Bear River Downstream of the Project

7.2.2.4.1 Bear River Fish Release below Camp Far West Reservoir

Figure 7.2-19 is a comparison of flow below the non-Project diversion dam throughout the simulation period under the Proposed Project (Future Condition) and the No Action Alternative (Baseline Condition). The difference in flow downstream of the non-Project diversion dam between the two alternatives can be substantial given the change in required minimum streamflows, the additional required pulse flows, the increase in storage capacity, and the reduced inflow under the Future Condition. The Proposed Project allows for increased capture of inflow and, thus, less spill from the reservoir, which is particularly impactful considering the reduced inflow volumes under the Future Condition hydrology. This causes a change to both the timing and volume of reservoir spills. Flow below the non-Project diversion dam is most noticeably different in the fall months of most years, and the winter and spring in Dry WYs. Overall, annual average flow below the non-Project diversion dam is 25,100 ac-ft less under the Proposed Project (Future Condition), due mostly to a reduction in inflow to Camp Far West Reservoir.

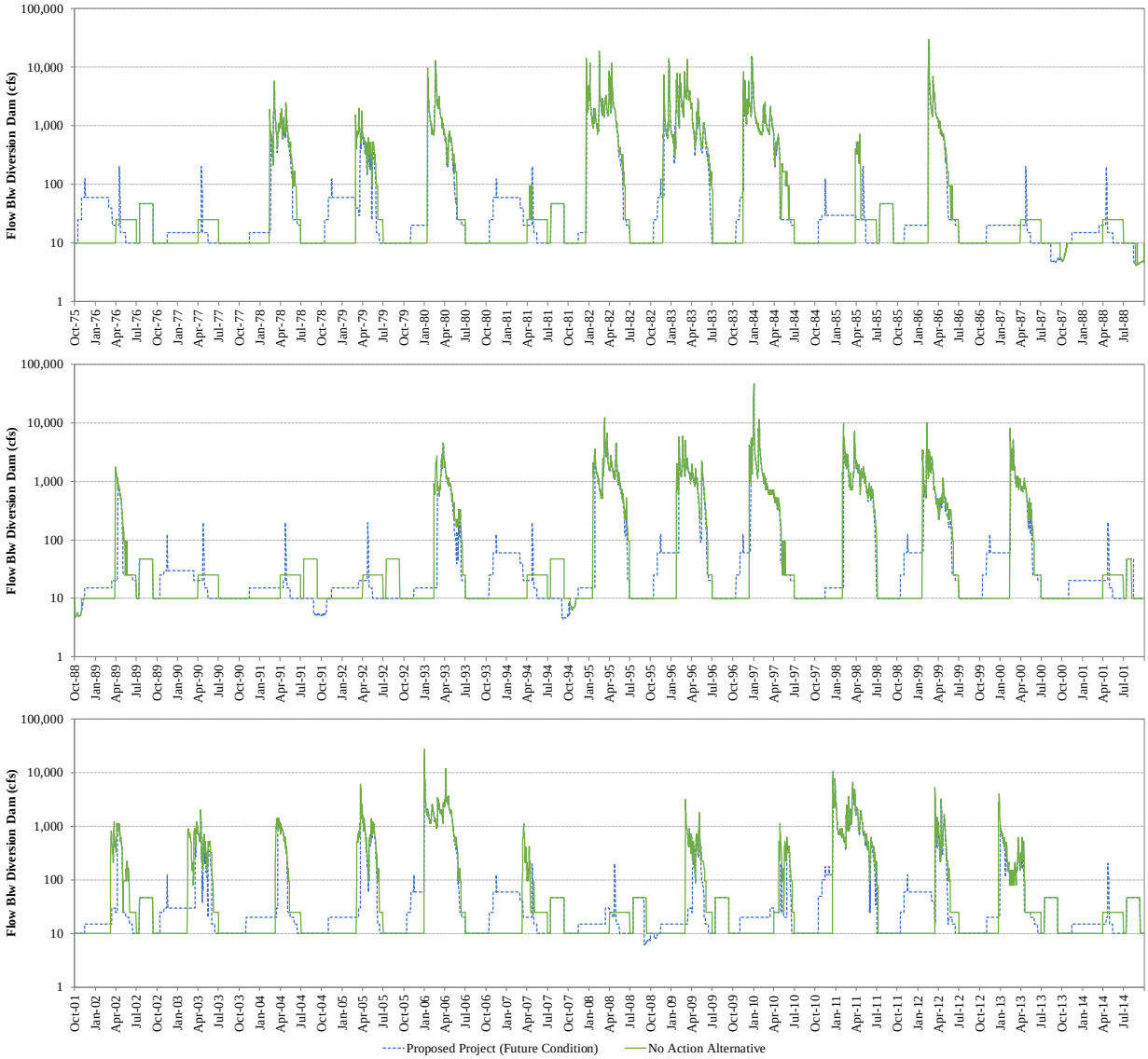

Figure 7.2-19. Comparison of flows in the Bear River downstream of the non-Project diversion dam from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Future Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 7.2-14 shows modeled daily, by month and over the simulation period, flow duration curves for the Bear River below the non-Project diversion dam under the Proposed Project (Future Condition). Results are different as compared to the No Action Alternative (Baseline Condiiton), which is primarily the result of the change in required minimum flow, addition of pulse flows, increased reservoir capacity, and reduced reservoir inflow.

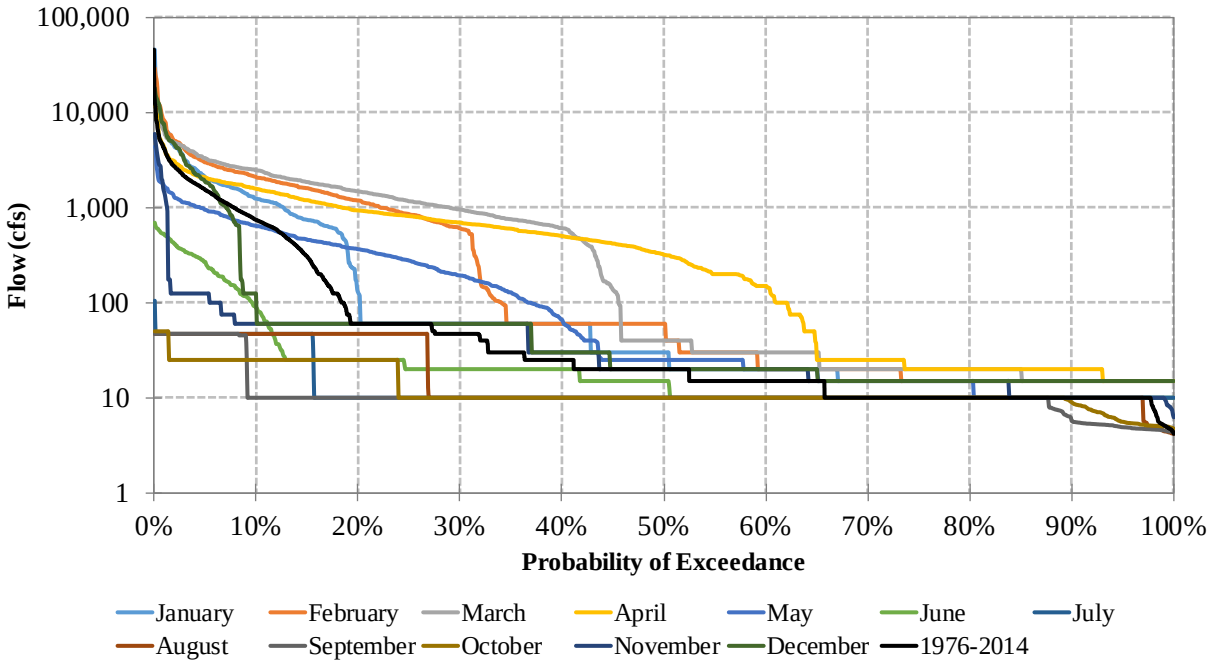

Figure 7.2-20. Modeled daily (by month and over the simulation period) flow duration curves below the non-Project diversion dam from WYs 1976 through 2014 under SSWD's Proposed Project (Future Condition). Flow is plotted in logarithmic scale to better show both high and low values.

7.2.2.4.2 Bear River Near Wheatland

The differences in Bear River streamflow near Wheatland between the No Action Alternative (Baseline) and the Proposed Project (Future Condition) are similar to those described in Section 7.2.2.4.1. Figure 7.2-21 shows a comparison of daily-modeled streamflow for the Bear River near Wheatland between the No Action Alternative and the Proposed Project (Future Condition).

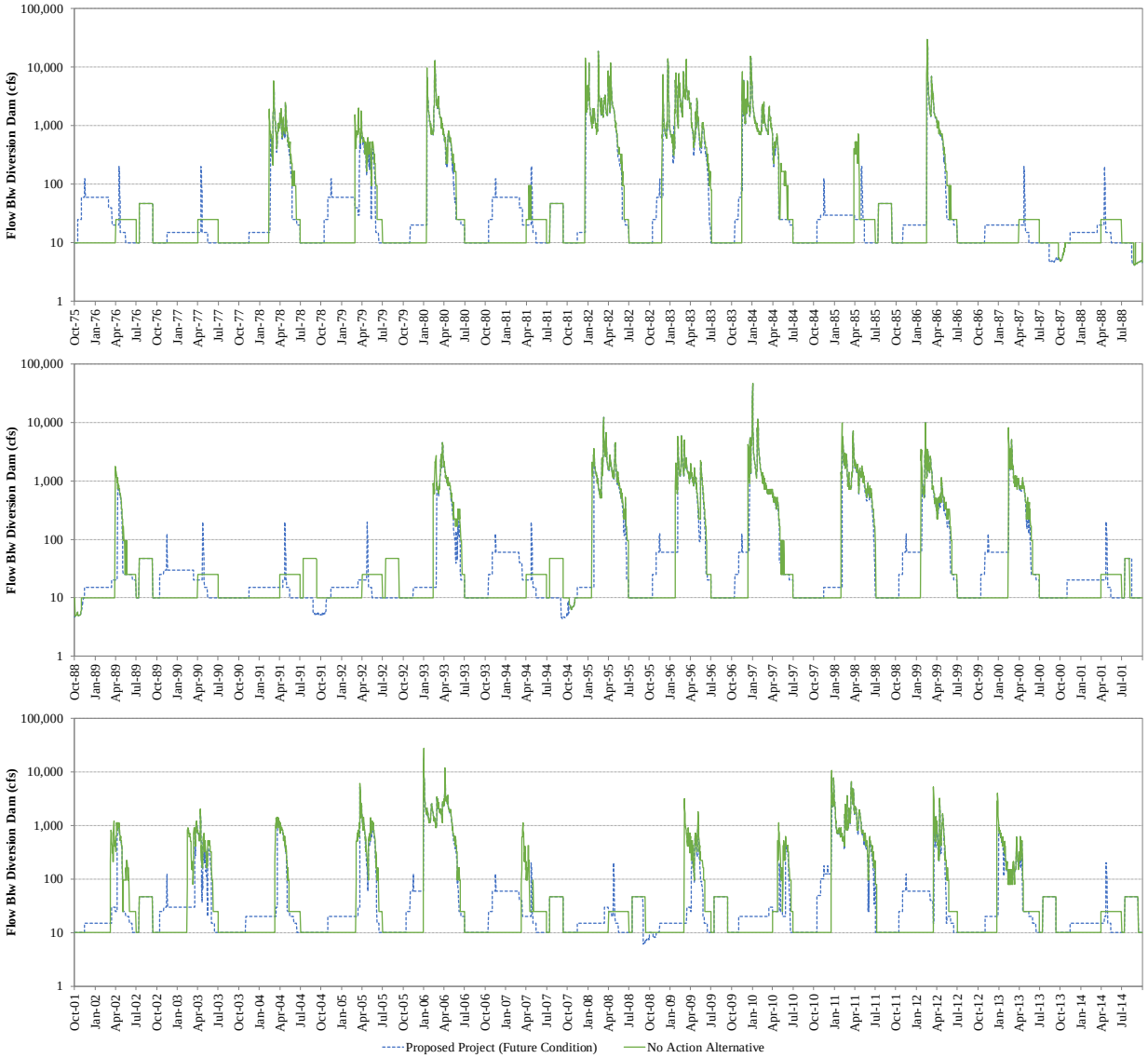

Figure 7.2-21. Comparison of flows in the Bear River near Wheatland from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Future Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 7.2-22 shows modeled daily, by month and over the simulation period, flow duration curves for the Bear River near Wheatland under the Proposed Project (Future Condition). Results are nearly identical in magnitude and probability to average monthly streamflow below the non-Project diversion dam under the Proposed Project (Future Condition).

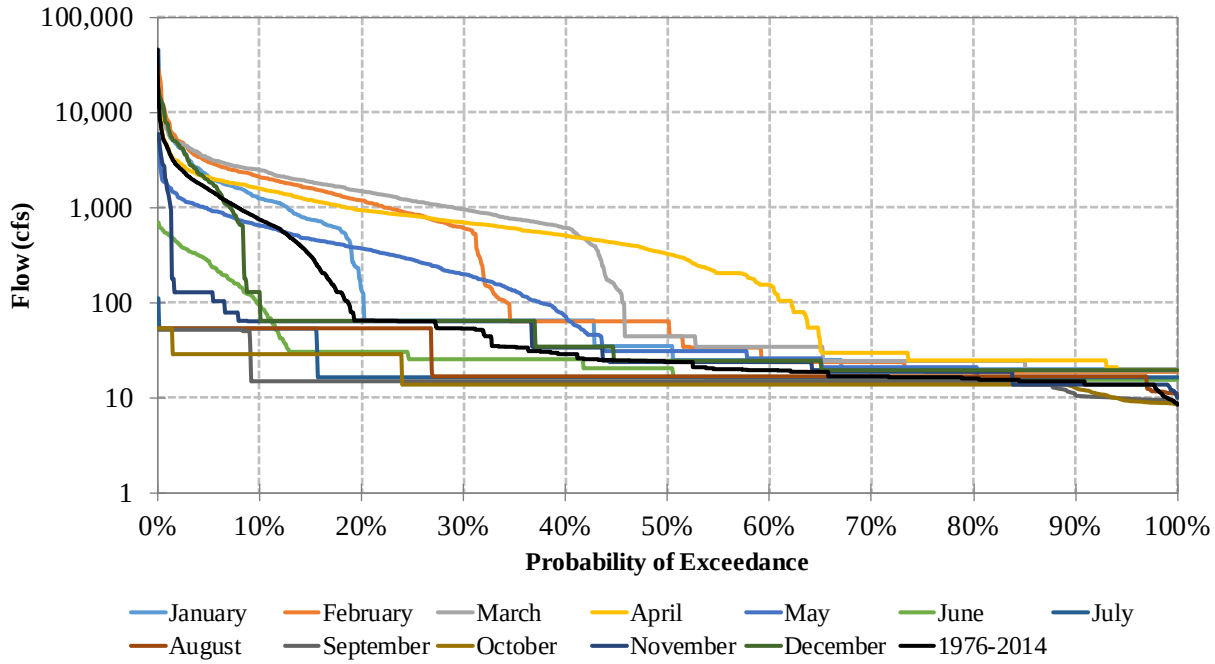

Figure 7.2-22. Modeled daily (by month and over the simulation period) flow duration curves for the Bear River near Wheatland from WY 1976 through WY 2014 under SSWD's Proposed Project (Future Condition). Flow is plotted in logarithmic scale to better show both high and low values.

7.2.2.4.3 Bear River at the Confluence with Feather River

Differences between flow in the Bear River at the Feather River confluence and flow in the Bear River near Wheatland under the Proposed Project (Future Condition) are similar. Changes in flow magnitude and timing between the Proposed Project and the No Action Alternative are nearly identical to those seen in Figure 7.2-19 and Figure 7.2-21, although not as noticeable given the influence from Dry Creek inflows.

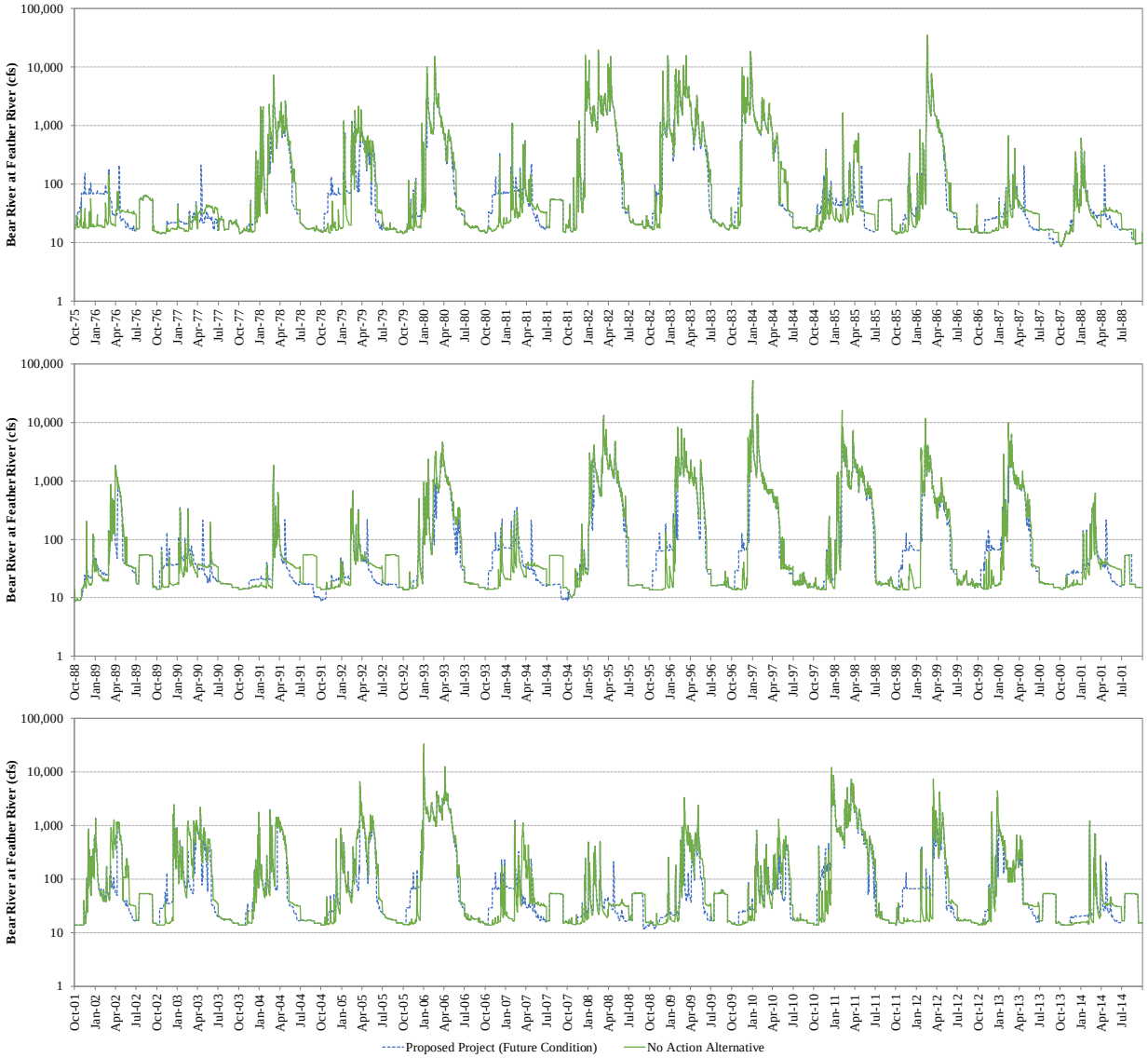

Figure 7.2-23. Comparison of flows in the Bear River at the Feather River confluence from WY 1976 through WY 2014 for the No Action Alternative (Baseline Condition) and the Proposed Project (Future Condition). Flow is plotted in logarithmic scale to better show both high and low values.

Figure 7.2-24 shows modeled daily, by month and over the simulation period, flow duration curves for the Bear River at the Feather River confluence under the Proposed Project (Future Condition). Results are similar in magnitude and probability to modeled daily streamflow below the non-Project diversion dam, albeit with some influence from Dry Creek inflows.

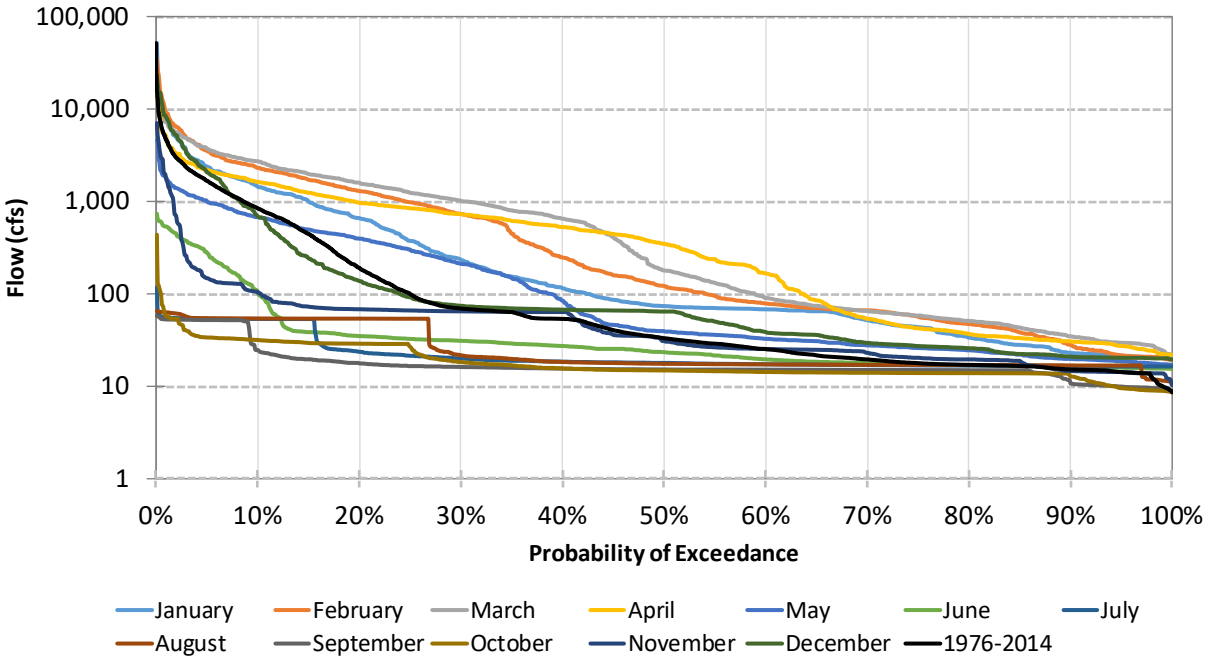

Figure 7.2-24. Modeled daily (by month and over the simulation period) flow duration curves for the Bear River at the Feather River confluence from WY 1976 through WY 2014 under SSWD's Proposed Project (Future Condition). Flow is plotted in logarithmic scale to better show both high and low values.

8.0 Use of Power

Unless the SSWD/SMUD contract is terminated sooner, SSWD will continue to lease the Camp Far West Powerhouse to SMUD through 2032, when the existing SSWD/SMUD Contract expires on July 1, 2031. SMUD will obtain all power produced at the Project.

Upon termination of the existing SSWD/SMUD Contract, SSWD plans to negotiate a new lease/power purchase contract or multiple contracts with, at this time, an unknown third party, which could be SMUD, or parties, and assumes the third party(ies) will sell the Project power into the market.

9.0 Plans for Future Development of the Project and in the Watershed

At this time, SSWD has no plans to expand the Project, other than those described in the Application for New License, or to develop other water projects in the Bear River watershed.

10.0 List of Attachments

None.

11.0 References Cited

Department of Water Resources (DWR), South Sutter Water District (SSWD) and Camp Far West Irrigation District (CFWID). 2000. Bay-Delta Settlement Agreement Between The Department of Water Resources of the State of California, South Sutter Water District and Camp Far West Irrigation District. Available online: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/SVG/

Elliott, T. C., Chen, K., and Swanekamp, R. C. 1997. Standard Handbook of Powerplant Engineering, Second Edition. McGraw-Hill October 1, 1997

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Application for New License
Major Project – Existing Dam

Exhibit C
Construction History and
Proposed Construction Schedule

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997

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June 2019

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None.

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EXHIBIT C

CONSTRUCTION HISTORY AND PROPOSED CONSTRUCTION SCHEDULE

1.0 Introduction

The South Sutter Water District (SSWD or Licensee) has prepared this Exhibit C, Construction History and Proposed Construction Schedule, as part of its Application for a New License Major Project – Existing Dam (Application for New License) from the Federal Energy Regulatory Commission (FERC) for the Camp Far West Hydroelectric Project, FERC Project Number 2997 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (traditional process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section (§) 5.18(a)(5)(iii), which require in part that the application include an Exhibit C, Construction History and Proposed Construction Schedule, in conformance with 18 C.F.R. Section 4.51(d). This Exhibit C describes, in detail, SSWD's proposed construction. As a reference, 18 C.F.R. Section 4.51(d) states:

> Exhibit C is a construction history and proposed construction schedule for the Project. The construction history and schedules must contain:
>
> (1) If the application is for an initial license, a tabulated chronology of construction for the existing projects structures and facilities described under paragraph (b) of this section (Exhibit A), specifying for each structure or facility, to the extent possible, the actual or approximate dates (approximate dates must be identified as such) of:
>
> (i) Commencement and completion of construction or installation;
>
> (ii) Commencement of commercial operation, and
>
> (iii) Any additions or modifications other than routine maintenance; and
>
> (2) If any new development is proposed, a proposed schedule describing the necessary work and specifying the intervals following issuance of a license when the work would be commenced and completed.

Besides introductory material, this exhibit includes two sections. Section 2.0 provides a history of Project construction. Section 3.0 describes SSWD's proposed construction schedule for proposed improvements to the Project under the new license.

See Exhibit A for a description of Project Facilities and features, Exhibit B for a description of Project operations, Exhibit D for costs and financing information, and Exhibit E for a discussion of potential environmental effects and SSWD's proposed resource management measures. Project design drawings and maps are included in Exhibits F and G, respectively. Exhibit H contains a detailed description of the need for the electricity provided by the Project, the availability of electrical energy alternatives, and other miscellaneous information.

All elevation data in this exhibit is in United States Department of Commerce (USDOC), National Oceanic and Atmospheric Association (NOAA), National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

2.0 Construction History of Existing Structures and Facilities

SSWD applies to FERC for a new license, not an initial license, for the Project. Therefore, the requirement of 18 C.F.R. Section 4.51(d)(1) regarding a tabulated chronology of construction of existing structures and facilities does not apply.

3.0 Construction Schedule for Proposed New Facilities

SSWD proposes three general change to existing Project facilities: 1) raising the normal maximum water surface elevation (NMWSE) of Camp Far West Reservoir by 5 feet (ft) from an elevation of 300 ft to an elevation of 305 ft;[1] 2) modifications to Project recreation facilities at Camp Far West Reservoir; and, 3) addition of an existing Road to the Project as a Project facility. In addition, SSWD proposes a slight modification to the existing FERC Project Boundary. This Exhibit C describes SSWD's construction methods and schedule for the Pool Raise, including recreation facilities that would be inundated by the Pool Raise. The existing road that SSWD proposes be added to the Project as a Primary Project Road is on SSWD-owned land within the proposed (and existing) FERC Project Boundary, and extends approximately 0.25 miles from a SSWD locked gate at Camp Far West Road to the Camp Far West Powerhouse and Switchyard. The road, which is not open to the public for safety reasons, is used and maintained solely by SSWD to access the Camp Far West Powerhouse and Switchyard and has an asphalt-paved surface approximately 20 feet wide and shoulder width of approximately 2 feet. The addition of the road to the Project will not include any construction since it is an existing road and does not require any upgrade. The construction schedules for recreation facilities are described in SSWD's Proposed Condition RR1, Implement Recreation Facilities Plan, which is included in Appendix E2 of Exhibit E. Modification to the Project Boundary are described in Exhibits A and G, and do not entail any construction.

3.1 Camp Far West Reservoir Pool Raise

As described in Section 5.1 of Exhibit A, SSWD will accomplish the pool raise by raising the Camp Far West Dam main spillway crest from its existing elevation of 300 feet (ft) to an elevation of 305 ft. SSWD's conceptual level planning for construction of the main spillway modification is described below.

[1] For the purpose of this exhibit, this is referred to as the "Pool Raise."

3.1.1 General

The existing spillway crest modifications to facilitate the pool raise would involve demolition of the existing concrete cap, the addition of 1,730 cubic yards (cy) of concrete to raise the spillway crest from an elevation of 300 ft to an elevation 305 ft, and anchoring of the new concrete with steel dowels. The spillway design would not change from its existing reinforced concrete, ungated, ogee-type weir and the existing 300-ft crest length will not change.

3.1.2 Construction Laydown and Staging Areas

A contractor staging area would be located south of Blackford Road, immediately adjacent to the auxiliary spillway. Activities at the staging area would include parking for concrete trucks and other construction vehicles, temporary storing of material (e.g., rebar for new concrete crest and demolished concrete), and meetings. At this time, SSWD anticipates the staging area will encompass 3.71 acres (ac) (Figure 3.1-1).

Figure 3.1-1. Anticipated construction laydown area and staging area for the Pool Raise.

3.1.3 Construction Borrow and Disposal Areas

Concrete would be brought from offsite (within 100 miles) thus there will be no on-site borrow areas associated with the Pool Raise. Steel needed for Pool Raise would be transported from Sacramento, CA. The approximately 550 cy of demolished concrete, rebar, and any other material from the spillway cap removal would be disposed of at an approved off-site facility that accepts construction waste, such as at the Western Regional Sanitary Landfill in Placer County, CA, which is permitted to receive construction waste in the quantities anticipated and is located within 50 miles of the Project (WPWMA 2018). Location and disposal of hazardous waste materials is not expected to occur for the Pool Raise.

3.1.4 Construction Roads and Traffic Considerations

Construction-related traffic would be spread over the duration of the Pool Raise work. During this period, the existing bridge over the spillway would likely be closed to through-traffic and detours around the dam may be required. During construction and the bridge closure, local residents would use McCourtney Road and then Riosa Road to access Highway 65 for north-south travel to Wheatland and the Sacramento areas (Figure 3.1-2). Closures and detours would be coordinated with Yuba County. The bridge would be permanently reopened following completion of the Pool Raise. There would be no work within the reservoir or the construction of any additional haul routes for the existing spillway modifications for the Pool Raise.

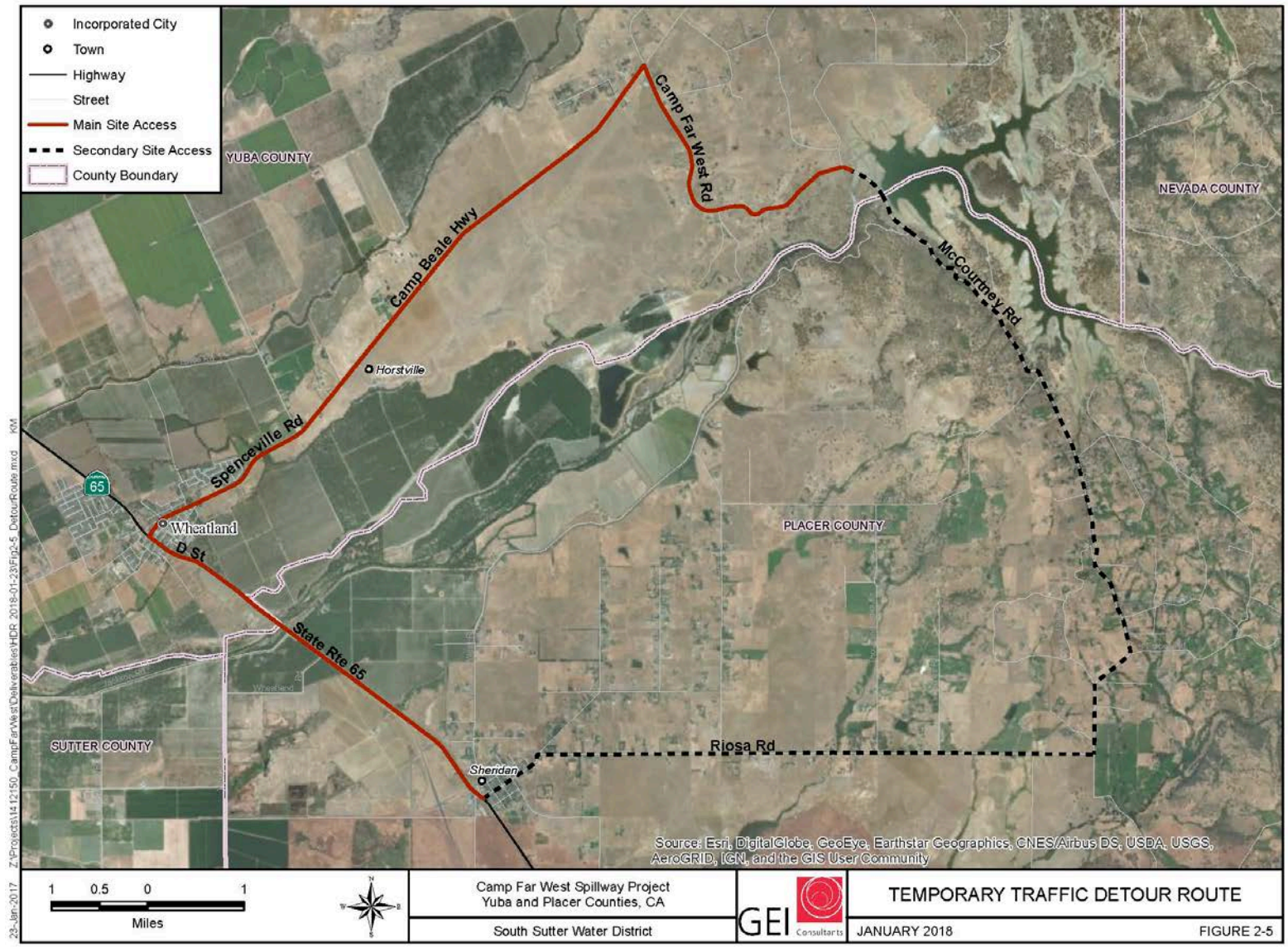

Figure 3.1-2. Anticipated traffic detour route during construction of the Pool Raise.

3.1.5 Construction Sequences and Schedule

At this time, SSWD anticipates that planning, design, and construction would take approximately 2 years to complete. The typical construction sequence for this type of work would include:

- Complete Pool Raise design
- Complete geotechnical investigations
- Consult agencies regarding engineering evaluations
- Obtain all necessary permits and approvals
- Notify adjacent landowners of upcoming pool raise
- On site kick off meeting to discuss logistics, work sequence and safety; Prepare site for demolition, including traffic control
- Demolition of existing weir, and removal of waste
- Prepare foundation for new concrete
- Construct forms for new concrete
- Install rebar and pour new concrete
- Relocate campsites
- Clean-up and site restoration

A draft preliminary schedule is shown in Table 3.1-3. A brief narrative description of the major tasks listed in Table 3.1-3 is presented below.

Table 3.1-1. Draft preliminary schedule for construction of the Pool Raise.

Task #	Task Name	Duration
1	**Complete Pool Raise Design**	**585 Days**
1.1	Seismological Investigation	45 days
1.2	Geotechnical Investigation	90 days
1.3	Geotechnical Data Evaluation	45 days
1.4	Agency Consultation on Engineering Evaluation	60 days
1.5	Preliminary (30%) Design & Specifications	120 days
1.6	Draft 60% Design & Specifications	90 days
1.7	Draft 90% Design & Specifications	90 days
1.8	Final (100%) Design & Specifications	45 days
2	**Complete Environmental Permitting and Obtain Regulatory Approvals**	**150 days**
2.1	Notify adjacent landowners of upcoming pool raise	1 day
3	**Onsite Kickoff Meeting**	**1 Day**
4	**Site Preparation**	**126 days**
4.1	Pre-Construction Meeting	2 days
4.2	Prepare Site for Demolition and Set Traffic Control	3 days
4.3	Demolishing and Removal of Waste	7 days
4.4	Prepare Foundation for New Concrete	5 days
4.5	Construct Forms for New Concrete	7 days
4.6	Install Rebar and Pour New Concrete	97 days
4.7	Relocate Inundated Recreation Facilities	90 days[1]

Table 3.1-1. (continued)

Task #	Task Name	Duration
5	**Site Cleanup and Restoration**	**1 day**
5.1	**Site Cleanup and Restoration**	**1 day**
	Total	**863 days**

[1] All work related to the recreation facilities relocation and described below in Section 3.1.5.9 will take 90 days overall. However, the work will occur in phases throughout 1 full calendar year to minimize any impacts to the recreation area visitors and experiences -- mostly outside the peak recreation season (i.e., Memorial Day through Labor Day holiday weekends). Refer to Section 3.3.6.2.1 in Exhibit E of this Application for New License for additional details.

3.1.5.1 Complete Pool Raise Design

3.1.5.1.1 Geotechnical Survey and Investigation

Subsurface investigations would be performed prior to the final design for the Pool Raise. Review of available historic information and construction drawings found explorations were previously conducted within the footprint of the existing spillway, and in the areas to the west of the proposed Pool Raise. SSWD would complete investigations needed to support the design of the existing spillway. This would include design-level investigation within the footprint of the existing spillway, which includes areas upstream and downstream of the concrete structure where excavation of overburden material is anticipated. The survey and investigation would include the following tasks:

- Seismological Investigation
- Geotechnical Investigation
- Basis of Design Report

Seismological Investigation

Seismological data would be to provide estimates on strong ground motion and seismic design parameters for the existing spillway. A review of surface-fault rupture hazard would be performed using existing California Geological Survey and USGS reports on active faults in the vicinity of the planned structure. SSWD would develop a database of historical and recent seismicity in the region to assess the controlling seismic source(s) for deterministic ground motion assessment. The evaluation of site seismicity would include the following critical parameters:

- The distance to the closest seismic source
- The specific geometry of the seismic source in the project area
- The maximum expected earthquake magnitude
- Deterministic and probabilistic response spectra

SSWD would prepare a detailed Subsurface Exploration Work Plan for geotechnical investigations. The investigations would focus on exploring the thickness of overburden, depth to competent bedrock, and engineering characteristics of the soil and rock beneath the existing spillway and bridge abutments. The work plan would describe locations of geotechnical explorations, samplings details, and other field exploration activities. A laboratory testing plan would be included in the work plan detailing the types and numbers of laboratory tests to be performed during subsurface investigations. The work plan would include any permits or access approvals needed to conduct the investigations, and methods for restoration of all areas disturbed by the field investigation.

The investigation program would consist of borings and test pits. Exploration locations and depths may be adjusted based on conditions encountered during the subsurface investigations. Access constraints and logistics would be further evaluated during preparation of the work plan. Site terrain may require track-mounted drilling equipment. The work plan would include the use of drilling and sampling equipment suitable for the site constraints, thus minimizing the need for access improvements.

All soil and rock samples collected from the borings and test pits would be carefully logged, labeled, and photographed. Exploratory borings would be continuously logged, describing the types and characteristics of the material encountered. Soils would be described in accordance with American Society for Testing and Materials (ASTM) D2487 Classification of Soils for Engineering Purposes and ASTM D2488 Description and Identification of Soils. Rock core samples would be identified and described based on standards developed by the International Society of Rock Mechanics (ISRM, 1981) and Bureau of Reclamation (2001). The borehole logs would include complete descriptions of materials encountered, including the frequency and orientation of fractures and joints, as well as additional relevant field information, such as fluid loss or penetration rates. Additionally, Core Recovery (REC) Rock Quality Designation (RQD) would be recorded and presented on boring logs based on procedures described in Deere and Deere (1989). The remaining samples and cores would be stored until completion of construction. Field logs would be prepared by the field logger, which would be reviewed by a senior geologist and input into a gINT log format for finalization.

Drill cuttings and fluid from the borings would be collected in 55-gallon drums or roll-away bins for testing and disposal. The cuttings would be hauled off-site for disposal after completion of laboratory testing. It is assumed that the cuttings would not contain hazardous or toxic material. All drilling and sampling activities would be performed at the direction of a qualified geologist licensed in the State of California. A field engineer or geologist would supervise all drilling and sampling and will log the soil and rock in accordance with ASTM standards.

The laboratory testing program would be finalized during implementation of the subsurface exploration program. It is assumed that index testing would include sieve analysis, Atterberg Limits, specific gravity, and bulk density to be performed on samples collected from the site. Additionally, unconfined compression tests would be performed on bedrock samples collected from within the preliminary footprint of the concrete spillway and bridge abutments.

Geotechnical Investigation

A geotechnical evaluation would be prepared to support the Pool Raise design. The evaluation would cover the methods and results of the necessary work needed to perform for the investigation, provide key graphics, and summarize the findings, conclusions, and recommendations. The evaluation would include the following:

- Detailed site map showing all investigations
- Boring logs, test pit logs, and laboratory results
- Updated site geologic map and two preliminary geologic cross sections oriented normal and parallel to the spillway alignment.
- Evaluation of design parameters

Work Plans, Reports, and Design Review

The following items will be submitted to FERC and DSOD for review and approval:

- Hydraulic Design Report and 30 percent design package
  - Expected submittal to agencies within 1 year of License issuance
  - Typical review period is approximately 30-45 days
- Geotechnical Design Recommendations Report and 60 percent design package
  - Expected submittal to agencies within 1.5 years of License issuance
  - Typical review period is approximately 30-45 days
- 90 percent and Final design package
  - Expected submittal to agencies within 2 years of License issuance
  - Typical review period is approximately 30 days

Design Review Coordination and Contractor Selection

SSWD would coordinate with FERC and DSOD at the 30 percent, 60 percent, 90 percent and final design milestones, as described above. Under a typical review schedule, SSWD could expect the final Pool Raise spillway design to be approved within 2 years of License issuance. If requested by FERC, a Board of Consultants will be put in place after the 30 percent design is available for review.

Following approval of the 60 percent design, SSWD would advertise the work for bid and contractor selection.

3.1.5.2 Obtain Permits and Approvals

SSWD would consult with FERC, federal, state and local agencies to discuss the Pool Raise's permitting/approval needs, including any necessary ground-disturbing investigations. Table 3.1-1 list permits and approvals that may be required.

Table 3.1-2. Anticipated permits and approvals that may be needed for the Pool Raise.

Permit/Approval	Issuing Body
Approval for inclusion in the License	FERC, including SWRCB's issuance of Clean Water Act Section 401 Water Quality Certification for FERC's issuance of the new license. Compliance with both NEPA and CEQA would be required. It is assumed d SSWD would be the lead agency for CEQA compliance.
Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers – Nationwide Permit (NWP) #3 [Maintenance] and #7 [Outfall Structures & Associated Intake Structures]
Clean Water Act Section 401 Water Quality Certification for Construction	Central Valley Regional Water Quality Control Board or State Water Quality Control Board
Section 1600 Streambed Alteration Agreement	California Department of Fish and Wildlife
Endangered Species Act – Section 7 Consultation	U.S. Fish and Wildlife Service. FERC or the USACE would be the lead agency for consultation. A biological opinion may be needed.
Endangered Species Act Incidental Take Permit	California Department of Fish and Wildlife
National Historic Preservation Act, Section 106	State Historic Preservation Office and Native Americans. FERC or the USACE would be the lead agency for consultation.
Endangered Species Act Incidental Take Permit	California Department of Fish and Wildlife
Grading permits	Counties of Sutter, Yuba and Nevada
Clean Water Act Section 402 (National Pollution Discharge Elimination System)	Central Valley Regional Water Quality Control Board
Stormwater Pollution Prevention Plan	Central Valley Regional Water Quality Control Board
Other Approvals	California Division of Safety of Dams, FERC

3.1.5.3 On-Site Kick-Off Meeting to Discuss Logistics, Work Sequence and Safety

A pre-construction meeting will be held with the construction contractor to discuss construction related activities including schedule, work sequencing, environmental requirements, temporary facilities, staging areas, parking, site access, traffic control, and various other items.

3.1.5.4 Prepare Site for Demolition, including Traffic Control

The following activities are expected to be performed to prepare for demolition work required for the existing weir:

- Set-up project notification and warning signs in accordance with Caltrans Unified Traffic Control Devices Manual Devices (MUTCD) and Yuba County standards at locations along the east and west approaches of Blackford Road to notify on-coming traffic of construction being conducted at the site.
- Provide traffic control as needed for deliveries and hauling of materials to and from the site.
- Set-up staging areas, including staging area near southeast side of existing bridge on Blackford Road.

- Set-up all environmental and safety controls.
- Construct access ramps to existing spillway.
- Move demolition tools and equipment to the existing weir area and set-up.

3.1.5.5 Demolition of Existing Weir, and Removal of Waste

The following activities are expected to be performed for the removal of the existing weir:

- Sawcut a minimum of 12" existing weir at elevation 295 on the vertical upstream face of the weir at elevation 295.71 on sloped downstream face of the weir. Sawcuts shall be perpendicular to the face of the weir.
- Stop sawcuts a minimum of 6-inches from longitudinal joints. Chip out concrete around waterstop and protect and preserve a minimum of 6-inches of the waterstop in the joints.
- The remaining concrete on the weir may be removed by hydroblasting or hydrodemolition. Removing concrete by hammering or percussion means shall not be allowed.
- All concrete removal by hydrodemolition and water used shall be contained and disposed of off-site.

3.1.5.6 Prepare Foundation for New Concrete

The following activities are expected to be performed for the preparation of the foundation for the new concrete:

- Surfaces of all existing concrete against which new concrete will be placed shall be roughened to a minimum of 0.25 inch amplitude.
- Within 48 hours prior to placement of new concrete, use low-pressure water jetting to remove all loose materials and rust at existing reinforcement.
- Protect exposed existing waterstops from sun exposure and damage during reinforcement installation procedures.
- Protect reinforcement after removal of existing concrete to preclude rust forming on the ends of exposed reinforcement.

3.1.5.7 Construct Forms for New Concrete

- Formwork shall be designed by an engineer licensed in the state of California and shall support all concrete placement loads.

- Formwork may consist of wood or steel; aluminum formwork or accessories shall not be allowed.
- Formwork shall be designed for placement of concrete in 2 lifts.

3.1.5.8 Install Rebar and Pour New Concrete

The following activities are expected to be performed for the installation of the new rebar and concrete:

- All reinforcement shall consist of 60 ksi reinforcement.
- Vertical anchor dowels shall consist of #10 bars and shall be placed in 2-inch diameter grouted holes with a minimum embedment as shown on the drawings and shall be located at 6-feet on-center each way in each section of the crest.
- Edge distance from joint to vertical anchors shall be a minimum of 6-inches and shall not exceed 12-inches.
- Vertical anchor dowels may be mechanically coupled above the surface of the concrete removal and above the existing apron with Engineer approved mechanical couplers.
- Anchor dowels shall have a 135-degree hook that connects with the reinforcement mat to be placed at the surface of the new structure.
- Dowels placed between new and existing concrete shall consist of #5 bars and shall be placed in 1-1/2-inch diameter holes with a minimum embedment of 8-inches and shall be located at 12-inches on center each-way in each structure.
- Place #5 dowels as shown to match existing longitudinal reinforcement.
- Edge distance from joint to dowels shall be a minimum of 6-inches and shall not exceed 12-inches.
- Roughen hole surfaces by means of a wire brush and remove loose materials prior to grouting all dowels.
- Place 9-inch waterstops per manufacturer’s requirements at each contraction joint to match existing waterstops. Weld new waterstops to existing waterstops per manufacturer recommendations.
- Place new #5 vertical longitudinal bars in first concrete lift to elevation 295 and allow for Type A lap with vertical bars from second and final lift in accordance with ACI 318.
- Horizontal #4 bars at 12-inches on-center shall be lapped as needed in crest sections and shall not extend through contraction joints.
- Minimum cover for all reinforcement shall be a minimum of 3-inches.
- Concrete shall be placed in 2 lifts the first lift to elevation 295 and the second lift to complete crest structure.

- Concrete mix design:
  - Minimum 28-day strength of 4,000 psi
  - Shall have a maximum aggregate size of 0.75
  - All aggregate shall be proven to conform to ASTM C1567 for alkali reactivity
  - Type II/V low alkali cement shall be used
  - Class F Fly Ash may be used up to a 20 percent replacement of cementitious materials to reduce heat of hydration in concrete
  - Air entrainment shall be a minimum of 6 percent
  - Maximum water/cement ratio of 0.45
  - All admixtures shall be compatible and shall not contain any chlorides
  - Maximum slump of concrete shall not exceed 3-inches.
- Roughen surface of first lift to be in contact with second lift to a 0.25 inch amplitude and remove all laitance and loose materials prior to placement of final concrete lift.
- All concrete placement work shall conform to ACI 305R and 306R hot and cold weather placements of concrete.
- Both lifts are categorized as mass concrete placements and shall be placed in accordance with ACI 207.1 to prevent thermal cracking.

3.1.5.9 Recreation Facilities Relocation

As a result of the Pool Raise, 104 recreational facilities or site features would be impacted along the shoreline at the NSRA and SSRA. Most of the impacted features (i.e., 59%) would be directly impacted by the pool raise by either partially or fully inundating the features. In these instances, the inundated features would be relocated, re-routed or re-aligned to avoid inundation. The remaining impacted features (i.e., 41%) would be indirectly impacted, whereby the Pool Raise would not inundate the feature, but would closely abut the feature likely resulting in flooding and/or erosion impacts to the features due to wind, wave or high flow events. In a few instances, a feature would be indirectly impacted and require relocation because an inundated segment of a circulation road would likely be re-aligned through these features. The construction work to relocate, re-route or realign the impacted features would be completed in one calendar year. Overall, the majority of the construction would occur outside the peak recreation season (i.e., Memorial Day through Labor Day holiday weekends). In instances where construction would be necessary during the peak season, the work would be restricted to select areas and conducted during low-use periods (i.e., weekdays) to minimize any impacts to the recreation facilities and visitor experiences.

At NSRA, 57 site features would be impacted, including 21 campsite living spaces (i.e., table and/or grill area), 19 campsite vehicle spurs, 13 circulation road segments (i.e., 2,410 ft of dirt roads and 480 ft of paved roads), 2 boat ramp and parking area segments, 1 picnic site, and 1

water hydrant. The majority of the impacted recreational site features at NSRA would be at the family campground (i.e., 43 impacted features) followed by the dispersed use areas (i.e., 6 impacted features – all dirt roads), group campground (i.e., 4 impacted features), and the day use area and boat launch facilities (i.e., each with 2 impacted features). At the family campground, most of the impacted features would be campsite living spaces and vehicle spurs (i.e., each with 19 impacted sites) with a five impacted road (dirt surface) segments. At the group campground, one of the two group campsites would be fully inundated. At the dispersed use areas, all of the impacted features would be the dirt roads (i.e., 1,410 ft) that provide shoreline access. Overall, most of the impacted features at NSRA (i.e., 61%) would be directly impacted by the pool raise and the remaining impacted features would be indirectly impacted (i.e., features abutting the 305 ft NMWSE).

At SSRA, 47 site features would be impacted, including 15 circulation road segments (i.e., 3,720 ft of dirt roads and 1,140 ft of paved roads), 11 campsite living spaces (i.e., table and/or grill area), 9 picnic sites, 7 campsite vehicle spurs, 1 boat ramp turnaround area, 1 parking area, 1 swim beach, 1 water hydrant, and 1 stage. The majority of the impacted recreational site features at SSRA would be at the family campground (i.e., 22 impacted features) followed by the day use area (i.e., 14 impacted features), dispersed use areas (i.e., 9 impacted features – all dirt road segments), the swim beach (i.e., 2 impacted features), and the boat launch (i.e., 1 impacted feature). At the family campground, most of the impacted features would be campsite living spaces (i.e., 11 sites), vehicle spurs (i.e., 7 sites) and road segments (i.e., 3 segments). At the dispersed use areas, all of the impacted features would be the dirt roads (i.e., 2,710 ft) that provide shoreline access. The entire swim beach would be inundated. Overall, most of the impacted features at SSRA (i.e., 55%) would be directly impacted by the Pool Raise and the remaining impacted features would be indirectly impacted (i.e., features abutting the 305 ft NMWSE). Notably, at five campsites in the family campground, the campsite living space and vehicle spurs would be indirectly impacted and require relocation because an inundated segment of the campground circulation road would likely be re-aligned through these campsites.

3.1.5.10 Clean-Up and Site Restoration

During construction daily clean-up activities will take place to keep construction and staging areas clean. After construction is completed the disturbed areas, including areas where temporary access or staging has taken place, will be restored to similar conditions prior to construction. Equipment, material, temporary facilities, temporary controls, etc. will be removed from the site. A final clean-up and walk-thru will be conducted to make sure site clean-up and restoration has been completed.

4.0 List of Attachments

None.

5.0 References Cited

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Application for New License
Major Project – Existing Dam

Exhibit D
Statement of Project Costs and Financing

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997

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List of Attachments

None.

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EXHIBIT D

STATEMENT OF PROJECT COSTS AND FINANCING

1.0 Introduction

The South Sutter Water District (SSWD or Licensee) has prepared this Exhibit D, Statement of Project Economics and Financing, as part of its Application for a New License Major Project – Existing Dam (Application for New License) from the Federal Energy Regulatory Commission (FERC or Commission) for the Camp Far West Hydroelectric Project, FERC Project Number 2997 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (traditional process). In particular, this Exhibit D conforms to the regulations in 18 C.F.R. Section 4.51(e), which describes the contents of Exhibit D, Statement of Project Costs and Financing. As a reference, 18 C.F.R. Section 4.51(e) states:

The [Exhibit D] statement must contain:

(1) If the application is for an initial license, a tabulated statement providing the actual or approximate original cost (approximate costs must be identified as such) of:
   - (i) Any land or water right necessary to the existing project; and
   - (ii) Each existing structure and facility described under paragraph (b) of this section (Exhibit A).

(2) If the applicant is a licensee applying for a new license, and is not a municipality or a state, an estimate of the amount which would be payable if the project were to be taken over pursuant to section 14 of the Federal Power Act upon expiration of the license in effect [see 16 U.S.C. 807], including:
   - (i) Fair value;
   - (ii) Net investment; and
   - (iii) Severance damages.

(3) If the application includes proposals for any new development, a statement of estimated costs, including:
   - (i) The cost of any land or water rights necessary to the new development; and
   - (ii) The cost of the new development work with a specification of:
     - (A) Total cost of each major item;
     - (B) Indirect construction costs such as costs of construction equipment, camps, and commissaries;
     - (C) Interest during construction; and
     - (D) Overhead, construction, legal expenses, taxes, administrative and general expenses, and contingencies.

(4) A statement of the estimated average annual cost of the total project as proposed, specifying any projected changes in the costs (life-cycle costs) over the estimated financing or licensing period if the applicant takes such changes into account, including:
   - (i) Cost of capital (equity and debt);
   - (ii) Local, state, and Federal taxes;
   - (iii) Depreciation or amortization;
   - (iv) Operation and maintenance expenses, including interim replacements, insurance, administrative and general expenses, and contingencies; and

(v) The estimated capital cost and estimated annual operation and maintenance expense of each proposed environmental measure.

(5) A statement of the estimated annual value of project power, based on a showing of the contract price for sale of power or the estimated average annual cost of obtaining an equivalent amount of power (capacity and energy) from the lowest cost alternative source, specifying any projected changes in the cost of power from that source over the estimated financing or licensing period if the applicant takes such changes into account.

(6) A statement specifying the source and extent of financing and annual revenues available to the applicant to meet the costs identified in paragraphs (e)(3) and (4) of this section.

(7) An estimate of the cost to develop the license application.

(8) The on-peak and off-peak values of project power, and the basis for estimating the values, for projects which are proposed to operate in a mode other than run-of-river.

(9) The estimated average annual increase or decrease in project generation, and the estimated average annual increase or decrease of the value of project power due to a change in project operations (i.e., minimum bypass flows, limits on reservoir fluctuations).

Besides this introductory section, this Exhibit D includes 12 sections. Section 2.0 describes the approach to estimating Project economics. Sections 3.0 and 4.0 address the cost of the original Project and cost related to takeover of the Project by another party, respectively. Section 5.0 describes Project cost of operations and gross power benefits under the No Action Alternative (i.e., existing conditions). Section 6.0 provides similar cost and power value for the Project as proposed by SSWD in this Application for New License. Section 7.0 compares the amount of power and value of power under the existing Project and SSWD's Proposed Project. Section 8.0 describes recent trends in the California power market that should be considered in this analysis. Section 9.0 describes how SSWD would finance continued Project operations and maintenance (O&M). Section 10.0 describes the need in the region for the Project power. Section 11.0 describes other developmental benefits of the Project. The last major section, 12.0, describes the consequences should FERC not issue a new license to SSWD. Section 13.0 includes a list of references cited.

See Exhibit A for a description of Project Facilities and features, Exhibit B for a description of Project Operations, Exhibit C for a construction history and a construction schedule, and Exhibit E for a discussion of potential environmental effects and SSWD's proposed resource management measures. Project design drawings and Project maps are included in Exhibits F and G, respectively. Exhibit H contains a detailed description of the need for the electricity provided by the Project, the availability of electrical energy alternatives and other miscellaneous information.

2.0 Project Economics Approach

2.1 Current Cost Approach

Under FERC's approach to evaluating the economics of hydropower projects as articulated in the Commission's Order Issuing a New License to the Mead Corporation (FERC 1995), the Commission employs a "current cost approach" in that all costs are presented in current dollars (e.g., no consideration for potential future power costs, inflation, escalation, or deflation beyond

the license issuance date; and costs to be expended over the license term are summed and normalized as current dollars). The Commission's current cost economic analysis provides a general estimate of the potential developmental benefits and costs[1] and non-developmental benefits and costs of a project.[2] SSWD has prepared this Exhibit D using the Commission's current cost method.

This Exhibit D provides economic information regarding the following two alternatives:[3]

- No Action Alternative.[4] This is the current operation of the Project under its existing license and the current waterway environment, with the exception that it assumes the flow requirements in FERC's 2014 Final Environmental Impact Statement for upstream Nevada Irrigation District's (NID) Yuba-Bear Project (FERC Project No. 2266) and Pacific Gas and Electric's (PG&E) Drum-Spaulding Project (FERC Project No. 2310) (FERC 2014), collectively, the Yuba-Bear Drum Spaulding (YB/DS) Projects are in place. SSWD considered this a reasonably foreseeable future action that should be included in the environmental baseline. Under the No Action Alternative, there are no changes to existing Project facilities, and no changes to existing Project operations.
  - Costs under the No Action Alternative are SSWD's best estimate of the costs to operate the Project in the future. While SSWD has relied somewhat on historic costs, it has not used those costs without adjustment for future considerations. Costs under the No Action Alternative are divided into two periods: 1) 2021, when the existing license expires, through 2031; and 2) 2032 through 2051. In the first period (i.e., 2021 through 2031), SSWD assumed the costs borne by the Sacramento Municipal Utility District (SMUD) under SSWD's and SMUD's August 1981 Contract for the Sale and Purchase of Electricity (SMUD Contract), which has a term of 50 years and expires on July 1, 2031, unless terminated earlier. In the second period (i.e., 2032 through 2051), SSWD estimated costs based on the adjusted historic costs of operations.
  - Project generation under the No Action Alternative is based on modeled generation from Water Year (WY) 1976 through WY 2014 using SSWD's relicensing Camp Far West Project Water Balance and Operations Model (Ops Model). Historic generation is also provided for context only.
  - Power generation benefits under the No Action Alternative are divided into two periods: 1) 2021, when the existing license expires, through 2031; and 2) 2032 through 2051. In the first period (i.e., 2021 through 2031), SSWD assumed the power costs paid to SSWD by the SMUD under the SMUD Contract. In the second

[1] Developmental benefits of the Project include power generation, water supply, irrigation and river navigation.
[2] Non-developmental benefits of a waterway include fish and wildlife resources, recreational opportunities and other aspects of environmental quality.
[3] Though not described in this Exhibit D, SSWD also developed Camp Far West Project Water Balance and Operations Model runs for SSWD's Proposed Project (Future) conditions. The model run is included in Appendix E1 of SSWD's Application for New License.
[4] The No Action Alternative is synonymous with the "environmental baseline" (FERC 1991) of Baseline Conditions. SSWD's Ops Model considers the No Action Alternative to be the "Base Case Scenario" or "Base Case Model Run."

period (i.e., 2032 through 2051), SSWD estimated the unit value of power using published information in the current California electricity market for the unit value of the power.

- SSWD's Proposed Project. This is SSWD's Proposed Project and it assumes, like in the No Action Alternative, flow requirements in FERC's FEIS for the YB/DS Projects are in place. The Proposed Project is the same as the existing Project with two exceptions: SSWD proposes to raise the Camp Far West Reservoir normal maximum water surface elevation (NMSWE) by 5 feet (ft) from 300 ft to 305 ft (i.e., Pool Raise);[5] and SSWD proposes certain protection, mitigation and enhancement (PM&E) conditions, as described in SSWD's Application for New License.
  - Costs under SSWD's Proposed Project assume SSWD's proposed costs for operations of the Project as proposed by SSWD in its Application for New License.
  - Project generation under the Proposed Project is based on modeled generation from WY 1976 through WY 2014 using SSWD's Ops Model.
  - Power generation benefits under the Proposed Project used the same assumptions regarding value of power as used in the No Action Alternative.

Basic economic assumptions used by SSWD in developing costs and benefits under both the No Action Alternative and SSWD's Proposed Project are summarized in Table 2.1-1.

Table 2.1-1. Assumptions SSWD used in developing costs and power benefits under SSWD's Proposed Project.

Assumption	Value
Dollars	Calendar Year 2018 United States (U.S.) dollars, unless otherwise specified
Period of Analysis	30 Years
Term of Financing	30 Years
Insurance Rate	0%
Base Year for Costs and Benefits	Calendar Year 2018, unless otherwise specified
Interest Rate	2.0%
Discount Rate	5.0%

While FERC's current cost approach requires an applicant to base costs in Exhibit D on a 30-year license term, SSWD requests, with good cause, from the Commission a new license with a term of 50 years. FERC's Policy Statement on Establishing License Terms for Hydroelectric Projects, 161 FERC ¶ 61,078 (2017) includes as a justification for granting a longer license term where significant measures are expected to be implemented under the new license for non-development purposes (i.e., environmental, recreation and water supply) or those that enhance power and developmental purposes. FERC's long-standing practice is to consider costs of improvements relative to the size of the project. Further, America's Water Infrastructure Act of 2018, Pub. L. No. 115-270, 132 Stat. 3765, requires FERC to give equal weight to investments by the licensee over the term of the existing license that resulted in redevelopment, new

[5] For the sake of simplicity in this Exhibit D, all analysis assume the Pool Raise is in place in the first year of the new license term, which is assumed to be 2021.

construction, new capacity, efficiency, modernization, rehabilitation or replacement of major equipment, safety improvements, or environmental, recreation, or other measures conducted over the term of the existing license. Based on these FERC and Congressional directives, SSWD's request for a 50-year license term is warranted. SSWD is in the process of constructing a new auxiliary spillway structure and related modifications which constitute a major investment in the Project. SSWD expects to spend approximately $8,812,206 on the spillway modifications (i.e., Secondary Spillway) and related Project modifications. Further, SSWD is proposing a 5 foot pool raise that will enhance the water supply benefits of the Project. SSWD's estimated cost for the pool raise is $3,942,264. SSWD also is proposing to relocate recreational facilities impacted by the pool raise, at an additional estimated cost of $725,000. These Project investments would total approximately $13,479,470, a very substantial amount for a 6.8 MW project, and are in addition to the costs of the PM&E measures proposed in the FLA.

3.0 Cost of Original Project

The initial license for the Project was issued by FERC to SSWD on July 2, 1981, effective on July 1, 1981, for a period of 40 years. The Project began commercial operations in 1985.

Because this is not an application for an initial license, a tabulated statement of the actual original cost of Project land, water rights, structures and facilities is not required to be included in SSWD's Application for New License.

4.0 Cost of Project Takeover

SSWD is a State of California public agency formed under California Water District Law, California Water Code Section 34000 et seq., within the meaning of Section 3(7) of the Federal Power Act (FPA). Since SSWD is a State subdivision, the Project is not subject to the takeover provisions of Section 14 of the FPA (16 U.S.C. § 807). Accordingly, an estimate of the amount, which would be payable if the Project was taken over pursuant to Section 14, is not required to be included in SSWD's Application for New License.

5.0 Annual Cost of Operations and Gross Power Benefits Under the No Action Alternative

Section 5.0 is divided into three major sections, each of which addresses the No Action Alternative. Section 5.1 discusses Project costs, Section 5.2 discusses Project power benefits, and Section 5.3 provides a summary of costs and benefits.

5.1 Cost of Operations

This annual cost reflects past investment costs owed on the Project, anticipated future investment costs, and current O&M costs. Specifically, this section provides annual cost estimates under the No Action Alternative for: 1) unrecovered past capital additions (i.e., the depreciated plant in-service costs); 2) costs related to acquiring and managing power purchase contracts; 3) local,

State of California and federal fees and payments unrelated to environmental and recreation measures; 4) capital costs unrelated to environmental and recreation measures; 5) normal O&M expenses unrelated to environmental and recreation measures; 6) cost to prepare SSWD's Application for New License; 7) cost to prepare an operating reserve; 8) costs related to providing Project power to the grid; and 9) normal O&M costs related to environmental and recreation measures. Table 5.1-1 shows the estimated annual cost of Project Operation under the No Action Alternative. Each of the cost components in Table 5.1-1 is discussed below.

Table 5.1-1. SSWD's estimated average annual costs over 30 years in 2018 U.S. dollars for the No Action Alternative.

Item	Total Capital, One-Time, or Repeating Costs Over 30 Years (2018 U.S. Dollars)	Average Annual Expenses (2018 U.S. Dollars)	Average Annual Cost[1] (2018 U.S. Dollars)
COSTS UNRELATED TO EXISTING ENVIRONMENTAL AND RECREATION CONDITIONS			
Depreciated Plant In-Service Costs[2]	--	$0	$0
Power Purchase Contract Costs[3]	--	$20,000	$20,000
Local, State and Federal Fees and Payments Unrelated to Environmental and Recreation Measures[4]	--	$87,500	$87,500
Capital Additions Costs Unrelated to Environmental and Recreation Measures[5]	$9,986,550	--	$332,185
Normal O&M Costs Unrelated to Environmental and Recreation Measures [6]	--	$665,667	$665,667
FERC License Application Costs[7]	$500,000	$16,667	$16,667
Operating Reserve[8]	--	$87,424	$87,424
Transmission Costs[9]	--	$1,000	$1,000
Subtotal	*$10,486,550*	*$878,258*	*$1,210,443*
COSTS RELATED TO EXISTING ENVIRONMENTAL AND RECREATION CONDITIONS			
Normal O&M Costs Related to Environmental and Recreation Conditions[10]	$9,388,000	$0	$312,933
Subtotal	*$9,388,000*	*$0*	*$312,933*
Total	**$19,874,550**	**$878,258**	**$1,523,276**

[1] Average Annual Cost is calculated by summing Total Capital, One-Time or Repeating Costs over 30 Years and the total of Annual Expenses over 30 years, and dividing the sum by 30 years.

[2] As described in Section 5.1.1.

[3] As described in Section 5.1.2.

[4] As described in Section 5.1.3.

[5] As described in Section 5.1.4.

[6] As described in Section 5.1.5.

[7] As described in Section 5.1.6. SSWD's estimated cost for relicensing is $3,500,000, but SSWD may be reimbursed $3,000,000 of relicensing costs by SMUD under the SMUD Contract.

[8] As described in Section 5.1.7.

[9] As described in Section 5.1.8.

[10] As described in Section 5.1.9.

5.1.1 Depreciated Plant In-Service Costs

Camp Far West Dam was in place and fully depreciated prior to issuance of the original licensee to SSWD. Pursuant to the terms of the SMUD Contract, SMUD paid for the initial cost of the powerhouse and ancillary facilities, and those facilities are fully depreciated. Refer to Section 5.1.4 regarding costs related to the spillway modification. Therefore, SSWD anticipates at this time no depreciation expenses over the next 30 years.

5.1.2 Power Purchase Contract Costs

As mentioned above, the SMUD Contract will remain in place through July 2031. Historically, SSWD spent about $10,000 annually in the management of this contract. However, when the SMUD Contract expires in 2031, SSWD intends to pursue and enter into a new power purchase contract(s) for the sale of Project's power. Besides the costs of soliciting proposals, SSWD must also manage the new contract. The cost for these activities (e.g., soliciting and entering into a new power purchase contract, managing the contract and power scheduling and settlement) is estimated to average $25,000 annually over the term of the new license. Therefore the estimated annual costs over 30 years is $20,000 (i.e., $10,000 for 10 years and $25,000 for 20 years).

5.1.3 Local, State and Federal Fees and Payments Unrelated to Environmental and Recreation Measures

As a public agency, SSWD is generally exempt from public taxation. However, SSWD pays various fees to federal, State of California, and local governments for Project-related support services unrelated to environmental or recreation measures. Table 5.1-2 includes a list of the fees and payments unrelated to environmental and recreation measures paid by SSWD in Calendar Year (CY) 2018. These annual fees and payments totaled $87,500. SSWD anticipates recent costs are reflective of future costs.

Table 5.1-2. Federal, State, and local fees and payments unrelated to environmental or recreation measures paid by SSWD in CY 2017.[1]

Agency to which Payment Was Made	Description of Payment	Annual Payment (2018 U.S. Dollars)
Federal Energy Regulatory Commission	Project Administration[2]	$10,528
California State Water Resources Control Board (SWRCB)	Water Rights	$41,952
California Division of Safety of Dams	Dam Safety	$35,020
Total	--	$87,500

[1] Federal State and local sales tax on capital improvement equipment is included in the costs for the capital improvement equipment shown in Sections 5.1.4 and 5.1.6.

[2] Annual administrative payments to FERC is based on total generation in that calendar year. From 2013 through 2017, these annual payments have averaged $10,538 and ranged from $6,946 in 2017 to $13,226 in 2013.

5.1.4 Capital Addition Costs Unrelated to Environmental and Recreation Measures

From 2008 through 2017, SMUD expended approximately $430,500 related to capital additions to the Camp Far West Powerhouse and appurtenant facilities, for an average annual capital expense of $43,050. During this same period, SSWD expended approximately $100,000 on Project non-powerhouse capital expenses, which average $10,000 annually. In addition, as mentioned above as ordered by FERC, by 2021 SSWD anticipates modifying the Camp Far West Dam spillway, at an estimated cost of $8,812,206.

SSWD anticipates that the above costs will continue over the next 30 years, though they will vary from year to year, and that SSWD will pay the capital additions to the Camp Far West Powerhouse after the SMUD Contract expires in 2031 (i.e., average annual estimate over next 30 years for SSWD of $29,145 [$43,500 times 0.67]. Therefore, SSWD estimates its costs

unrelated to environmental or recreation measures, is $332,885 (i.e., $29,145 + $10,000 + $293,740). The costs do not include contingency for unexpected repair work that are covered under the operating reserve (Section 5.1.7).

5.1.5 Normal O&M Costs Unrelated to Environmental and Recreation Measures

Recently, SMUD's annual expenses to operate the powerhouse and appurtenant facilities averaged approximately $615,000, which included approximately $137,000 for O&M expenses,[6] $206,000 for preventative maintenance, and $272,000 for corrective maintenance. SSWD expended an average of $30,000 on Project non-powerhouse O&M, for a total annual O&M expense of $1,260,000 by both SMUD and SSWD. The expenses include SSWD's O&M staff time, interim replacement costs, insurance, administration and general expenses. SSWD anticipates these costs to decrease slightly in the new license, and estimates future annual O&M costs to average $1,000,000. SSWD notes that the Camp Far West Powerhouse costs will be reimbursed by SMUD to SSWD under the SMUD contract, but that would only be for the first 10 years of the new license term. Therefore, the Normal O&M costs will be $30,000 for years (i.e. 2021 through 2031) then $1,000,000 for 20 years (i.e., 2031 through 2051) for a total weighted average annual cost of $656,667.

5.1.6 FERC License Application Costs

To date, SSWD has expended about $2,800,000 to prepare its Application for New License. These costs include SSWD's internal administrative costs, costs spent on outside consultants including the cost to complete the relicensing studies, and the cost for the pre-filing consultation process with the resource agencies and other Relicensing Participants through late 2018. SSWD's cost to complete the relicensing process may be as high as an additional $700,000 if, as provided under the Energy Policy Act, evidentiary trial-type hearings occur and parties choose to offer alternative measures. Therefore, the total cost for relicensing is estimated to be $3,500,000.

Section 9.b of the SMUD Contract provides that SMUD will place into escrow $300,000 per year from the 31st (i.e., 2011) through the 40th year (i.e., 2021) of the SMUD Contract and that the sum in escrow along with any earnings, will be paid to SSWD when SSWD receives from FERC a new license with a term extending to at least July 1, 2031, or if the risk that the license will not be renewed through 2031 is removed to the satisfaction of SMUD and SSWD. SSWD anticipated recovering over the term of the new license costs related to relicensing that are not recovered from the SMUD escrow fund. These costs are anticipated to be $500,000, or $16,667 annually over 30 years.

5.1.7 Operating Reserve

SSWD maintains an overall District reserve of $1,000,000 annually, of which approximately 50 percent is allocated to the Project. However, SSWD anticipates creating and maintaining a larger

[6] Under the SMUD Contract, SMUD will pay O&M expenses, excluding preventative and corrective expenses, through 2031 when the contract expires, unless the contract is terminated at an earlier date.

reserve over the term of new license because the SMUD Contract will expire. SSWD anticipates the reserve will be approximately 100 percent of anticipated capital expenses and 100 percent of estimated annual O&M expenses. Therefore, the reserve would be $1,311,424. Assuming the reserve is built-up, totally depleted and built-up again twice 30 years, the annualized cost of creating and replenishing the reserve as related to the Project is $87,424.

5.1.8 Transmission Line Access Costs

Under the existing SMUD Contract, SMUD pays Pacific Gas and Electric Company (PG&E) annually for transmission access. After 2031, SSWD will pay this amount. This equates to an annual average of $1,000.[7]

5.1.9 Costs Related to Environmental and Recreation Measures

Over the next 30 years under the conditions in the existing license, SSWD anticipates it would replace and upgrade existing recreation facilities to current standards at the North Shore Recreation Area and South Shore Recreation Area, at costs of approximately $5,500,000 and $3,888,000, respectively. The costs to maintain and operate the Project recreation facilities would continue to be covered by the fees collected for use of the facilities. Therefore, SSWD's estimated cost related to environmental and recreation measures is $9,388,000, or $312,933 annually over 30 years.

5.2 Gross Power Benefits

Gross power benefits reflect the avoided cost of replacing the Project's energy generation and dependable capacity with equally reliable energy and capacity from an alternative source.

This section is divided into four subsections. Section 5.2.1 includes Project authorized installed capacity and estimates dependable capacity. Installed capacity is FERC's authorized installed capacity (i.e., nameplate rating), and dependable capacity is provided as historical dependable capacity and modeled dependable capacity, the latter using SSWD's Ops Model. Section 5.2.2 provides an estimate of energy generation under the No Action Alternative from two sources: 1) historical actual generation from 2010 through 2017; and 2) modeled generation from WY 1976 through WY 2014 using the most recent version of SSWD's Ops Model. Section 5.2.3 provides an estimate of the unit value of power. Section 5.2.4 estimates the value of the power under the No Action Alternative using modeled energy generation provided in Section 5.2.2 and the market prices of energy and capacity provided in Section 5.2.4. Section 5.2.5 provides an estimate of the cost of the Project's power if it was provided by combined-cycle natural gas-fired generation, the most likely replacement power alternative.

[7] The Project itself contains no transmission lines.

5.2.1 Project Capacity

5.2.1.1 FERC Authorized Installed Capacity

The Project has one powerhouse with one generating unit. The FERC total authorized installed capacity for the powerhouse and the total FERC-authorized installed nameplate capacity for the Project is 6,800 kilowatts (kW).

5.2.1.2 Historical Dependable Capacity

The dependable capacity of a generating facility is defined as "*the generating capacity that the plant can deliver under the most adverse water supply conditions to meet the needs of an electric power system with a given maximum demand*." (Elliott et al. 1997). One of the critical parameters for defining dependable capacity is the period over which the capacity must be provided. Traditionally, a year or season from time of maximum storage to minimum storage is used for the time period over which capacity is calculated. The most adverse time period since the Project began operations in 1985 was WY 1988. During this time period, the maximum storage in Camp Far West Reservoir was 61,900 acre-feet (ac-ft) (i.e., 274.6 ft reservoir elevation) on April 24, 1988, and a minimum storage of 3,500 ac-ft (i.e., 183.0 ft reservoir elevation) on September 30, 1988. The Project generated 6,970 kW in WY 1988, as power was generated over a 5-day period in late June. For Camp Far West Powerhouse to generate power, reservoir elevation must be above 236 ft, and reservoir releases through the powerhouse must generally be above 300 cubic feet per second (cfs). As such, power is typically only generated when the reservoir is spilling and water can be released through the powerhouse instead of over the spillway, or when downstream demands are high and reservoir releases are increased to meet demand. If the reservoir elevation and release volume do not meet the powerhouse constraints, then releases are not made through the powerhouse.

5.2.1.3 Modeled Dependable Capacity

The relicensing hydrologic period of record from WY 1976 through WY 2014 begins before Project operation began to capture hydrologic conditions during the most adverse recent hydrology period of WY 1977, which was characterized by the most extreme recent 1-year drought conditions, which also followed WY 1976, also a dry WY. The July through August 1977 period was used to compute modeled dependable capacity, which equals 0 kW.

The difference between the historical dependable capacity of 6,970 kW and the modeled dependable capacity of 0 kW is a result of the periods of record being compared. Historical reservoir storage records indicate that the maximum elevation Camp Far West Reservoir reached in WY 1977 was 215.8 ft, well below the powerhouse intake at 236 ft. The modeled dependable capacity period of record includes WY 1977, and thus simulates 0 kW of power output during this year. Conversely, the historical period of record does not begin until Calendar Year (CY) 1985, when the Camp Far West Powerhouse began operating. As such, the historical record does not include potential power output during low storage conditions in WY 1977.

5.2.2 Energy Generation

5.2.2.1 Historical Energy Generation

Table 5.2-1 shows the historical annual and monthly gross generation in megawatt-hours (MWh) at Camp Far West Powerhouse from CY 2010 through 2017. Over the past 10 years, total generation averaged 22,637 MWh, and ranged from 3,728 MWh in 2015 to 40,874 MWh in 2017. In 2017, generation ranged from 77 MWh in November to 5,366 MWh in January.

Table 5.2-1. Historic total and average monthly gross generation in megawatt-hours for Calendar Years 2010 through 2017 at Camp Far West Powerhouse.[1]

Month	Historic Monthly Gross Generation by Calendar Year (MWh)								Average Monthly & Average Annual Generation (MWh)
	2010	2011	2012	2013	2014	2015	2016	2017	
January	0	5,369	0	5,436	0	0	18	5,366	2,024
February	239	4,882	0	3,861	0	189	2,024	4,819	2,002
March	2,191	5,420	2,817	1,258	0	405	5,283	5,132	2,813
April	2,900	5,087	5,035	176	2,040	0	4,644	4,967	3,106
May	4,930	5,229	4,384	3	448	0	3,239	4,937	2,896
June	3,846	4,437	1,770	41	0	0	2,758	3,536	2,049
July	4,402	3,590	2,207	844	1,856	1,663	3,232	3,429	2,653
August	3,323	3,491	1,695	1,272	1,512	1,471	2,782	2,893	2,305
September	643	972	165	39	0	0	437	927	398
October	0	0	0	0	0	0	0	226	28
November	931	0	0	0	0	0	0	77	126
December	4,737	3	5,020	0	6	0	3,573	4,565	2,238
Total	**28,142**	**38,480**	**23,093**	**12,930**	**5,862**	**3,728**	**27,990**	**40,874**	**22,637**

[1] Source: Monthly SSWD Payment Calculations Memoranda from SMUD (the memo reports total monthly kWh generation, and these have been rounded to total monthly MWh generation in the table).

Some of the generated power is used at Camp Far West Powerhouse for station use. Station energy use annually is less than 1 MWh. The Project does not support any ancillary services.

Table 5.2-2 shows SSWD's estimate of peak and off-peak generation in MWh for WYs 2010 through 2017 for the Camp Far West Powerhouse using historic generation.

Table 5.2-2. Estimated annual and monthly historical peak and off-peak generation in megawatt-hours for Calendar Years 2010 through 2017 for Camp Far West Powerhouse.

Month	Peak (MWh)	Off-Peak (MWh)	Total (MWh)
January	787	1,236	2,024
February	775	1,227	2,002
March	1,086	1,727	2,813
April	1,202	1,904	3,106
May	1,125	1,772	2,896
June	791	1,257	2,049
July	1,028	1,625	2,653
August	892	1,413	2,305
September	154	244	398
October	11	17	28
November	49	77	126
December	866	1,372	2,238
Total	**8,764**	**13,873**	**22,637**

5.2.2.2 Modeled Energy Generation

SSWD has operated the Project since 1985. However, Project operations have changed throughout time. Therefore, in some cases, historical information may not provide the best picture of existing conditions. To better describe existing energy generation over a range of hydrologic conditions, SSWD developed its Ops Model to represent the current operating regime, and used the hydrological period of record from WY 1976 through WY 2014 as input to the model. This hydrological period of record was used throughout the relicensing process. Table 5.2-3 provides a summary of monthly and annual generation at Camp Far West Powerhouse based on a run of the Ops Model under the No Action Alternative.

Table 5.2-3. Modeled average monthly and annual gross generation in megawatt-hours for Calendar Years 1976 through 2014 at Camp Far West Powerhouse under the No Action Alternative.[1]

Month	Total (MWh)
2021 THROUGH 2032 PERIOD (10 YEARS)	
January	1,170
February	1,910
March	2,817
April	3,099
May	3,247
June	2,846
July	2,724
August	2,072
September	241
October	0
November	93
December	534
Annual Average for 2021 through 2031	*20,752*
2032 THROUGH 2051 PERIOD (20 YEARS)	
January	1,170
February	1,910
March	2,817
April	3,099
May	3,247
June	2,846
July	2,724
August	2,072
September	241
October	0
November	93
December	534
Annual Average for 2032 through 2051	*20,752*
Annual Average for 2021 through 2051	**20,752**

[1] Source: No Action Alternative Model Run of the Camp Far West Project Ops Model, which is in Exhibit E, Appendix E1, of SSWD's Application for New License, and post-processing.

Table 5.2-4 shows SSWD's estimate of peak and off-peak generation in MWh for WYs 2010 through 2017 for the Camp Far West Powerhouse using modeled generation.

Table 5.2-4. Estimated annual and monthly modeled peak and off-peak generation in megawatt-hours for Calendar Years 2010 through 2017 for Camp Far West Powerhouse.[1]

Month	Peak (MWh)	Off-Peak (MWh)	Total (MWh)
2021 THROUGH 2032 PERIOD (10 YEARS)			
January	453	717	1,170
February	739	1,171	1,910
March	1,091	1,726	2,817
April	1,200	1,899	3,099
May	1,256	1,991	3,247
June	1,102	1,744	2,846
July	1,054	1,670	2,724
August	802	1,269	2,072
September	93	148	241
October	0	0	0
November	36	57	93
December	207	327	534
Annual Average for 2021 through 2031	*8,034*	*12,718*	*20,752*
2032 THROUGH 2051 PERIOD (20 YEARS)			
January	453	717	1,170
February	739	1,171	1,910
March	1,091	1,726	2,817
April	1,200	1,899	3,099
May	1,256	1,991	3,247
June	1,102	1,744	2,846
July	1,054	1,670	2,724
August	802	1,269	2,072
September	93	148	241
October	0	0	0
November	36	57	93
December	207	327	534
Annual Average for 2032 through 2051	*8,034*	*12,718*	*20,752*
Annual Average for 2021 through 2051	**8,034**	**12,718**	**20,752**

[1] Source: No Action Alternative Model Run of the Camp Far West Project Ops Model, which is in Exhibit E, Appendix E1, of SSWD's Application for New License, and post-processing.

There is significant uncertainty as to what hydrology the Project will experience during the 2021 through 2031 period and the 2032 through 2051 periods. Accordingly, monthly average values over the Ops Model period of record are included in Table 5.2-3 to provide an appropriate hydrologic baseline for comparing potential changes to power service contracts.

Monthly average power output from the Ops Model is similar to the historical average monthly power generation, except for December and January. The historical generation data include output for 2010 through 2017, which shows power production in three out of eight January months and four out of eight December months. This reflects somewhat above average runoff in these months, particularly in December, as over the Ops Model period of record, flow was sufficient enough to produce power in only 7 out of 39 December months.

5.2.3 Unit Value of Power[8]

5.2.3.1 Market Price of Capacity

The Project provides Resource Adequacy services. For the California power market, the CPUC has established that sufficient capacity to serve expected load must be provided by load serving entities (LSE) as Resource Adequacy (California Public Utilities Code Section 380). Additionally, the California Independent System Operator (CAISO) identifies target levels of system, local and flexible Resource Adequacy for each LSE. Currently, there is no transparent market for Resource Adequacy products because each LSE provides and acquires the necessary resources through the development of bilateral negotiations. In addition to market transparency challenges, the different Resource Adequacy types (e.g., system, local and flex) have different values, and the volume and term of transaction dictate different pricing structures that further confound accurate pricing. Finally, California is currently experiencing a glut of Resource Adequacy, which results in a depressed and uncertain market for Resource Adequacy. Due to the limitations on determining the market for capacity and the availability of capacity values, this element of the benefits of the Project cannot be determined.

5.2.3.2 Market Price of Energy

5.2.3.2.1 2012 through 2031 Period

As described earlier, SSWD's Power Purchase Contract with SMUD extends until 2031, unless terminated earlier. Under this contract, all Project power is sold to SMUD at an agreed-upon rate, irrespective of time-of-day period. Over the past 5 years, the generation rate averaged $11.1591/MWh, and ranged from $10.8944/MWh in 2017 to $11.77113/MWh in 2014. In 2017, the generation rate averaged $11.8944/MWh and ranged from $11.0763/MWh in December to $10.6378/MWh in January. (Table 5.2-5.)

Table 5.2-5. Monthly prices for Camp Far West Powerhouse energy paid by SMUD to SSWD under the SMUD Contract from March 2013 through February 2017.

Month	Energy Price[1] (Dollars/MWh)					Average Monthly Energy Price (Dollars/MWh)
	2013	2014	2015	2016	2017	
January	11.5888	11.5319	11.5945	10.6890	10.6378	11.2084
February	11.4920	11.4465	11.4579	10.5866	10.6150	11.1196
March	11.4749	11.4920	11.2528	10.4670	10.7232	11.0820
April	11.5262	11.5888	10.9396	10.3929	10.8524	11.0600
May	11.6344	11.7312	10.8827	10.3360	10.8827	11.0934
June	11.6230	11.7882	10.9112	10.3872	10.8941	11.1207
July	11.5945	11.8679	10.8599	10.4385	10.9909	11.1503
August	11.6287	11.8451	10.9852	10.5353	10.9852	11.1959
September	11.6572	11.8622	11.0877	10.6720	11.0308	11.2620
October	11.6515	11.8451	11.0478	10.6663	11.0137	11.2449

[8] Any use of the market prices of installed and dependable capacity and energy information in this Exhibit D for forecasting current or future value of Project power is speculative, may be inappropriate, and is subject to the user's assumptions and risk.

Table 5.2-5. (continued)

Month	Energy Price[1] (Dollars/MWh)					Average Monthly Energy Price (Dollars/MWh)
	2013	2014	2015	2016	2017	
November	11.6344	11.7768	10.9453	10.6036	11.0308	11.1982
December	11.6173	11.7597	10.7688	10.6492	11.0763	11.1743
Average	**11.5936**	**11.7113**	**11.0611**	**10.5353**	**10.8944**	**11.1591**

[1] Source: Monthly SSWD Payment Calculations Memoranda from SMUD. From March 2016 through December 2017, the memo refers to this rate as a "Billing Rate per MWh." In previous memos, this is referred to as a "Billing Rate per kWh." However, mills/kWh equals dollars per MWh. As used in the memos, the dollars per MWh rate is clearly used as a billing rate.

Other Revenue Related to Power Sales from 2021 through 2031

Section 9.a of the SMUD Contract provides that SMUD will pay to SSWD "*semiannual in amounts which will, each year, total to an amount that equals one-half the average debt service which has been paid annually upon the bonds*" from the 41st year (i.e., 2021) through the remainder of the contract period (i.e., 2031, unless terminated earlier). These revenues are estimated to be $75,000 annually, and are added to the power revenue price from years 2021 through 2031 in Table 5.2-7.

5.2.3.2.2 2032 through 2051 Period

SSWD assumed it would enter into a new power purchase contract(s) in 2032 when the existing SMUD Contract expires, and the energy rates under the new contract(s) would be the prevailing rates in California. Under California's Renewable Portfolio Standards (RPS) regulations, California investor-owned utilities, electric service providers, and community choice aggregators must increase procurement from eligible renewable energy resources to 50 percent of total procurement by 2030. The Camp Far West Powerhouse qualifies as an RPS-eligible generating unit because it has a nameplate capability of less than 30 MW.[9] SSWD's approach to valuing energy generated by the Camp Far West Powerhouse after the SMUD Contract expires is discussed below.

The CAISO publishes current and historical prices for each of the several thousand nodes within its electrical balancing area using a web-based system called Open Access Same-time Information System (OASIS). In OASIS, settled prices are provided for the various markets run by the CAISO, including the Day-Ahead Market, which provides for hourly pricing of energy. The Camp Far West Powerhouse is represented as PNode CAMPFW_7_FARWST in the system, and a Locational Marginal Price (LMP) is published for each hour of the day for this node. To determine prices to be used with the energy generation under the No Action Alternative resulting from SSWD's Ops Model, 2 years of hourly LMPs from January 2015 to December 2016 were averaged to obtain a single representative year of recent historical hourly values. Table 5.2-6 lists a summary of Camp Far West Powerhouse LMPs in dollars per MWh, averaged by month.

[9] The Camp Far West Powerhouse is eligible for Renewable Energy Credits through the California Energy Commission (CEC). The powerhouse is registered under CEC Plant ID H0083.

Table 5.2-6. Anticipated energy prices for Camp Far West Powerhouse after the SMUD Contract expires in 2031 based on current CAISO prices.

Month	Monthly Avg of LMP's 2015 ($/MWh)	Monthly Avg of LMP's 2016 ($/MWh)	Monthly Avg of LMP's ($/MWh)
January	34.15	29.09	31.62
February	30.40	23.60	27.00
March	30.67	15.76	23.22
April	32.17	16.80	24.48
May	32.40	18.73	25.56
June	35.66	25.81	30.74
July	34.49	29.95	32.22
August	32.35	33.60	32.98
September	34.25	34.56	34.41
October	32.49	33.35	32.92
November	29.85	30.30	30.07
December	29.18	34.82	32.00

5.2.3.3 Market Price of Other Energy Products

SSWD may have opportunities to sell other energy products from time to time; additionally the CAISO may further modify its markets and products to include different energy products or pricing structures. Some potential energy product sales (e.g., "non-carbon" energy that is not RPS certified) may be of interest to buyers via bilateral contracts. Such products may be of only modest value and will not have transparent pricing associated with them. New CAISO markets or products may have transparent pricing. However, it is impossible to speculate as to future products and values at this time. As a result, no revenue value is assigned to any energy products at this time, outside of those values discussed in the previous three sections.

5.2.4 Gross Power Benefits

5.2.4.1 Power Benefits Based on SMUD Contract and Market Prices

Power benefits were calculated for two periods (i.e., 2021 through 2031 period and the 2032 through 2051 period), and then a weighted average annual benefit was calculated. The 2021 through 2031 ten-year period used the modeled energy generation in Table 5.2-4 and the value of the energy provided in Table 5.2-5, which is from the SMUD Contract. The 2032 through 2051 20-year period used the modeled energy generation in Table 5.2-4 and the value of the energy provided in Table 5.2-6, which is from CAISO market prices. To calculate the weighted average, one-third weight was applied to the 2021 through 2031 period, and two-thirds weight was applied to the 2032 through 2051 period. Energy generation power benefits are provided in Table 5.2-7.

Table 5.2-7. Simulated average annual gross power benefits in 2018 U.S. dollars for the No Action Alternative.[1]

Month	Average Monthly Generation (MWh)	Average Monthly Value ($/MWh)	Average Monthly Generation Value ($)	Other Revenue Related to Power Sales[2]	Total Average Monthly Value
2021 THROUGH 2032 PERIOD (10 YEARS)					
January	1,170	11.2084	$13,114	$75,000	$88,114
February	1,910	11.1196	$21,238	$75,000	$96,238
March	2,817	11.0820	$31,218	$75,000	$106,218
April	3,099	11.0600	$34,275	$75,000	$109,275
May	3,247	11.0934	$36,020	$75,000	$111,020
June	2,846	11.1207	$31,650	$75,000	$106,650
July	2,724	11.1503	$30,373	$75,000	$105,373
August	2,072	11.1959	$23,198	$75,000	$98,198
September	241	11.2620	$2,714	$75,000	$77,714
October	0	11.2449	$0	$75,000	$75,000
November	93	11.1982	$1,041	$75,000	$76,041
December	534	11.1743	$5,967	$75,000	$80,967
Annual Average for 2021 through 2031	*20,752*	--	*$230,809*	--	*$1,130,809*
2032 THROUGH 2051 PERIOD (20 YEARS)					
January	1,170	31.62	$36,995	--	$36,995
February	1,910	27.00	$51,570	--	$51,570
March	2,817	23.22	$65,411	--	$65,411
April	3,099	24.48	$75,864	--	$75,864
May	3,247	25.56	$82,993	--	$82,993
June	2,846	30.74	$87,486	--	$87,486
July	2,724	32.22	$87,767	--	$87,767
August	2,072	32.98	$68,335	--	$68,335
September	241	34.41	$8,293	--	$8,293
October	0	32.92	$0	--	$0
November	93	30.07	$2,797	--	$2,797
December	534	32.00	$17,088	--	$17,088
Annual Average for 2032 through 2051	*20,752*	--	*$584,598*	*$0*	*$584,598*
Weighted Annual Average for 2021 through 2051[3]	**20,752**	**--**	**$462,002**	**--**	**$759,002**

[1] Source: SSWD's Proposed Project Model Run of the Camp Far West Project Ops Model, which is in Exhibit E, Appendix E1, of SSWD's Application for New License, and post-processing.

[2] Other Revenues Related to Power Sales are annual payments from SMUD to SSWD, as described in Section 5.2.3.2.1.

[3] Weighted 33 percent for 2012 through 2032 period and 67 percent for the 2032 through 2051 period.

5.2.5 Power Benefits Based on Replacement Power

Any decrease in power generation at the Project would need to be offset by increased purchases of zero emissions energy or by construction of new zero emission power generating facilities to comply with California's Clean Energy and Pollution Reduction Act (Senate Bill 350), which establishes California's greenhouse gas reduction target of 40 percent below 1990 levels by 2030 and 80 percent by 2050; and to California's Renewables Portfolio Standard Program (Senate Bill 100), which mandates that all retail sellers procure electricity products from eligible renewable energy resources and zero-carbon resources so that the kWh of those products sold to their retail end-use customers achieve 60 percent by December 31, 2030 and 100 percent by December 31, 2045 of any given agency's total energy portfolio. In California, the most likely alternative zero-emission sources of power would likely be utility-scale solar, though solar generation is considered a "non-dispatchable" energy resource (non-dispatchable in that generation output occurs only when fuel, in this case solar radiation, is available). The Camp Far West Project is

somewhat dispatchable; although the Project typically runs in baseload (i.e., steady generation output), generation levels can be adjusted.

The U.S. Energy Information Administration (EIA) produces an Annual Energy Outlook, which includes an assessment of the levelized cost of new generation resources. The EIA's 2018 Annual Energy Outlook (https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf) identifies the estimated levelized cost of electricity for a non-dispatchable utility photovoltaic system at $46.50/MWh. Based on a No Action Alternative average annual generation of 20,752 MWh (Table 5.2-7) and EIA's cost per MWh of $46.50, replacing Project power with a utility photovoltaic system would cost on average $964,968 per year.

Any new alternative power source would need to be developed, which is probably a 3 to 5 year time frame.

The CAISO Market prices reflect the current California energy market prices, and would be equivalent to the replacement power cost.

5.3 Summary of No Action Alternative Costs and Power Benefits

Table 5.3-1 summarizes the Project's costs and power benefits under the No Action Alternative, based on the information provided above.

Table 5.3-1. SSWD's estimate of average annual costs and power benefits in 2018 U.S. dollars under the No Action Alternative.

Value	No Action Alternative
AVERAGE ANNUAL GROSS POWER BENEFITS	
Capacity	--
Installed[1]	6,800 kW
Dependable[2]	0 kW
Subtotal - Value in 2018 Dollars	*$0*
Energy[3]	20,752 MWh
Subtotal Energy[4]	*$759,002*
Subtotal - Value in 2018 Dollars[4]	*$759,002*
Total – Value in 2018 Dollars	**$759,002**
AVERAGE ANNUAL COSTS	
Non-Environmental/Recreational[5]	$1,210,443
Environmental/Recreational[6]	$312,933
Total - Value in 2018 Dollars	**$1,523,376**
AVERAGE ANNUAL NET BENEFIT	
Total 2018 U.S. Dollars[7]	**-$763,374**

[1] From Section 5.2.1.1.
[2] From Section 5.2.1.3.
[3] From Table 5.2-3.
[4] From Section 5.2.4.1.
[5] From Table 5.1.1.
[6] From Section 5.1.9.
[7] Calculate by subtracting total for Average Annual Costs from total for Average Annual Gross Power Benefits.

6.0 Annual Cost of Operations and Gross Power Benefits Under SSWD's Proposed Project

Section 6.0 is divided into four major sections, each of which addresses SSWD's Proposed Project (Near-Term Condition). Section 6.1 discusses SSWD's proposed new facilities, Section 6.2 discusses Project costs, Section 6.3 discusses power benefits, and Section 6.4 provides a summary of costs and benefits.

6.1 Proposed New Facilities

SSWD proposes one major addition to the Project, the Pool Raise. Refer to Section 5.1 of Exhibit A regarding changes to Project facilities to accommodate the Pool Raise, Section 7.2 of Exhibit B related to operations with the Pool Raise, and Section 3.1 of Exhibit C regarding construction related to the Pool Raise. Based on a preliminary design and feasibility study, SSWD estimates construction of the Pool Raise will cost roughly $3,942,264. A breakdown of the construction costs is presented in Table 6.1-1.

Table 6.1-1. SSWD's estimated costs for construction of the Camp Far West Reservoir Pool Raise.

Description	Cost (2018 U.S. Dollars)
Pre-Construction and General	$100,000
Civil Works	$2,000,000
Start-up and Testing	$154,344
Subtotal Base Construction Cost (BCS)	*$2,254,344*
Allowance for Unlisted Items / Design Development / Regulatory Requirements	$270,500
Construction Management & Construction Phase Engineering Services (10% of BCS)	$225,400
Environmental Compliance / Permitting (3% of BCS)[1]	$67,600
Environmental Mitigation (3% of BCS)	$67,600
Legal/Owner Admin (4% of BCS)	$90,200
Contingency, including Schedule and Construction (40% of BCS)	$901,700
Subtotal Estimated Cost with Contingency	*$1,623,000*
Financing Costs (4% of Subtotal)	$64,920
Total	**$3,942,264**
Total Cost Over 30 Years	**$3,942,264**

Source: GEI

In addition, the Pool Raise will inundate a number of existing recreation facilities that will likely need to be relocated. SSWD estimates the cost for relocation of inundated recreation facilities is $725,000.

Therefore, the total cost of the Pool Raise is estimated to be $4,667,264 (i.e., $3,942,264 plus $725,000), or $155,755 annually over 30 years.

6.2 Annual Cost of Operations

6.2.1 O&M Costs Unrelated to Environmental and Recreation Conditions

The estimated annual cost to operate the Project under SSWD's Proposed Project will not change appreciably, even with the Pool Raise, as compared to the No Action Alternative. Table 6.2-1 provides the estimated annual cost of Project operation under the Proposed Project.

Table 6.2-1. SSWD's estimated average annual costs over 30 years in 2018 U.S. dollars for the No Action Alternative.

Item	Total Capital, One-Time, or Repeating Costs Over 30 Years (2018 U.S. Dollars)	Average Annual Expenses (2018 U.S. Dollars)	Average Annual Cost[1] (2018 U.S. Dollars)
COSTS UNRELATED TO EXISTING ENVIRONMENTAL AND RECREATION CONDITIONS			
Depreciated Plant In-Service Costs[2]	--	$0	$0
Power Purchase Contract Costs[3]	--	$20,000	$20,000
Local, State and Federal Fees and Payments Unrelated to Environmental and Recreation Measures[4]	--	$87,500	$87,500
Capital Additions Costs Unrelated to Environmental and Recreation Measures, Excluding the Pool Raise[5]	$9,986,500	--	$332,185
Normal O&M Costs Unrelated to Environmental and Recreation Measures [6]	--	$665,667	$665,667
FERC License Application Costs[7]	$500,000	$16,667	$16,667
Operating Reserve[8]	--	$87,424	$87,424
Transmission Costs[9]	--	$1,000	$1,000
Subtotal	$10,486,550	$878,258	$1,210,443
COSTS RELATED TO EXISTING ENVIRONMENTAL AND RECREATION CONDITIONS			
Normal O&M Costs Related to Environmental and Recreation Conditions[10]	$9,568,000	$123,500	$442,600
Subtotal	*$9,568,000*	$123,500	$442,600
Total	$20,024,550	$1,002,028	$1,653,043

[1] Average Annual Cost is calculated by summing Total Capital, One-Time or Repeating Costs over 30 Years and the total of Annual Expenses over 30 years, and dividing the sum by 30 years.
[2] As described in Sections 5.1.1 and 6.2.1.
[3] As described in Section 5.1.2.
[4] As described in Section 5.1.3.
[5] As described in Section 5.1.4.
[6] As described in Section 5.1.5.
[7] As described in Section 5.1.6.
[8] As described in Section 5.1.7.
[9] As described in Section 5.1.8.
[10] As described in Section 6.2.2.

6.2.2 O&M Costs Related to Environmental and Recreation Conditions

SSWD's Proposed Project includes eight Project-specific environmental/recreational resource management measures, which are described in provided in Appendix E2 of Exhibit E. SSWD's estimated costs, including assumptions related to the costs for each of these measures is provided by condition in Table 6.2-2. SSWD's estimated annual cost to implement the conditions is $442,600.

Table 6.2-2. SSWD's estimated costs in 2018 dollars related to implementation of SSWD's Proposed Measures as part of continued operation of the Project.

SSWD's Proposed Measure		Total Capital Cost Over 30 Years[1] (2018 U.S. Dollars)	Total O&M Cost Over 30 Years (2018 U.S. Dollars)	Annualized Cost Over 30 Years[2] Excluding Energy (2018 U.S. Dollars)	Assumptions Over 30 Years
Designation in This Application for New License	**Description**				
WR1	Implement Water Year Types	--	$15,000	$500	Assumes SSWD determined water year types, as required by the measure.
AR1	Implement Minimum Streamflows	--	$15,000	$500	Same cost as under the existing conditions: continuation of flow requirements in existing license.
AR2	Implement Fall and Spring Pulse Flows	--	$30,000	$1,000	Assumes SSWD implements the pulse flows, as required by the measure.
AR3	Implement Ramping Rates	--	$60,000	$2,000	Assumes SSWD implements the pulse flows, as required by the measure.
TR1	Implement a Bald Eagle Management Plan[2]	$12,000	$255,000	$8,900	Assumes two bald eagle nests present each year, requiring a half-day spent by two SSWD employees to put up buoys and signs at each site during Limited Operating Period (LOP) and another half-day to remove them after LOP is complete. Assumes one permanent sign placed within 220 feet of the bald eagle nest up the riverine arm and replace 3 times during the course of the license. Assumes surveys for bald eagles conducted every the first year of license issuance and every ten years thereafter, for a total of three surveys during the 30-year license period.
TR2	Implement Blue Heron Rookery Management	--	$75,000	$2,500	Assumes one heron rookery present each year of the license, requiring a half-day spent by two SSWD employees to put up buoys and signs at the site during Limited Operating Period (LOP) and another half-day to remove them after LOP is complete.
RR1	Implement Recreation Facilities Plan	--	--	--	Rehabilitation or replacement of all existing facilities over the term of license; operation and maintenance of the North Shore and South Shore Recreation Areas. The costs to maintain and operate the Project recreation facilities would continue to be covered by the fees collected for use of the facilities.
	North Shore Recreation Area	$5,563,000	$0	$185,433	
	South Shore Recreation Area	$3,893,000	$0	$129,767	

Table 6.2-2. (continued)

SSWD's Proposed Measure		Total Capital Cost Over 30 Years[1] (2018 U.S. Dollars)	Total O&M Cost Over 30 Years (2018 U.S. Dollars)	Annualized Cost Over 30 Years[2] Excluding Energy (2018 U.S. Dollars)	Assumptions Over 30 Years
Designation in This Application for New License	**Description**				
CR1	Implement Historic Properties Management Plan	$100,000	$3,260,000	$112,000	Capital cost is based on data recovery at one site for a cost of $100,000. O&M cost is based on NRHP evaluation of 22 archeological sites at $40,000/site ($880,000); data recovery at 15 sites at $100,000/site ($1,500,000); data recovery at one archaeological district $200,000. Assumes annual costs of $5,000/yr for compliance report, $10,000/yr for monitoring 3 sites, and $5,000/yr for meetings with tribes and agencies ($20,000 x 30 = $600,000); and once every 10 years to review HPMP at a cost of $10,000/review ($10,000 x 3 = $30,000). Also, assumes access will be granted during the license to document three sites and survey previously inaccessible lands ($50,000).
Total		**$9,568,000**	**$3,705,000**	--	--
Annualized Over 30 Years		--	--	**$442,600**	--

[1] Capital cost include new facilities or equipment or replacement of existing facilities or equipment with facilities or equipment that extend the life expectancy of the existing facilities or equipment.

[2] Total annualized costs are calculated by summing Capital Cost and Total O&M Cost, and dividing the sum by 30.

This estimate does not include the cost of relocating recreation facilities that would be inundated or otherwise made unusable due to SSWD's proposed Pool Raise. The costs to relocate those facilities is included in the Pool Raise cost estimate. In addition, this estimate does not include costs related to implementation of potential measures that could be contained in "mandatory conditions" from the United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) FPA Section 18 fishway prescriptions; NMFS's and United States Department of the Interior, Fish and Wildlife Service's (USFWS) measures that may be included in an Endangered Species Act Biological Opinion for the Project; the State Water Resources Control Board's (SWRCB) Clean Water Act Section 401 Water Quality Certificate, and FERC's Standard Articles. These potential conditions have not been provided to SSWD as of yet. Implementation of these additional measures may result in significant increases to SSWD's estimate of costs to implement conditions under the new license.

6.3 Annual Gross Power Benefits

This section is divided into three subsections. Section 6.3.1 includes changes in Project installed capacity and estimates dependable capacity under SSWD's Proposed Project. Section 6.3.2 describes changes in energy generation under SSWD's Proposed Project. Section 6.3.3 provides the change to the value of the power under SSWD's Proposed Project.

6.3.1 Project Capacity

SSWD does not propose any changes to the Project that would affect the Project's installed capacity, described in Section 5.2.1.1.

The methods described in Section 5.2.1.3 were used to determine the dependable capacity under the SSWD's Proposed Project. SSWD estimates the dependable capacity under the Proposed Project would be 0 kW, as reservoir elevation does not rise above 236 ft in WY 1977.

6.3.2 Energy Generation

Table 6.3-1 provides a summary of monthly and annual generation at Camp Far West Powerhouse based on a run of the Ops Model under SSWD's Proposed Project.

Table 6.3-1. Modeled average monthly and annual gross generation in megawatt-hours for Calendar Years 1976 through 2014 at Camp Far West Powerhouse under SSWD's Proposed Project.[1]

Month	Peak (MWh)	Off-Peak (MWh)	Total (MWh)
2021 THROUGH 2032 PERIOD (10 YEARS)			
January	436	691	1,128
February	731	1,157	1,887
March	1,045	1,653	2,698
April	1,221	1,932	3,154
May	1,299	2,059	3,359
June	1,134	1,793	2,927
July	1,097	1,738	2,834
August	882	1,395	2,277

Table 6.3-1. (continued)

Month	Peak (MWh)	Off-Peak (MWh)	Total (MWh)
2021 THROUGH 2032 PERIOD (10 YEARS) (cont'd)			
September	123	194	317
October	0	0	0
November	32	51	83
December	207	328	535
Annual Average for 2021 through 2031	*8,207*	*12,992*	*21,200*
2032 THROUGH 2051 PERIOD (20 YEARS)			
January	436	691	1,128
February	731	1,157	1,887
March	1,045	1,653	2,698
April	1,221	1,932	3,154
May	1,299	2,059	3,359
June	1,134	1,793	2,927
July	1,097	1,738	2,834
August	882	1,395	2,277
September	123	194	317
October	0	0	0
November	32	51	83
December	207	328	535
Annual Average for 2032 through 2051	*8,207*	*12,992*	*21,200*
Annual Average for 2021 through 2051	**8,207**	**12,992**	**21,200**

[1] Source: SSWD's Proposed Project Model Run of the Camp Far West Project Ops Model, which is in Exhibit E, Appendix E1, of SSWD's Application for New License, and post-processing.

SSWD estimates approximately 447 MWh/yr of increased average annual power generation under SSWD's Proposed Project (Near-Term Condition) as compared to the No Action Alternative. Values included in Table 6.3-1 include monthly average values over the Ops Model period of record to provide an appropriate hydrologic baseline for comparing potential changes to power service contracts. The primary reason for the increased generation is that the Pool Raise would allow water to be stored that was previously spilled, increasing hydropower head, and increasing storage throughout the year, which results in additional opportunities to produce power.

6.3.3 Gross Power Benefits

Based on the above estimation of capacity and energy and unit values for each of these, as defined in Section 5.2.3, Table 6.3-2 provides annual gross power benefits for SSWD's Proposed Project.

Table 6.3-2. Simulated average annual gross power benefits in 2018 U.S. dollars for SSWD's Proposed Project.[1]

Month	Average Monthly Generation (MWh)	Average Monthly Value ($/MWh)	Average Monthly Generation Value ($)	Other Revenue Related to Power Sales[2]	Total Average Monthly Value
2021 THROUGH 2032 PERIOD (10 YEARS)					
January	1,128	11.2084	$12,643	$75,000	$87,643
February	1,887	11.1196	$20,983	$75,000	$95,983
March	2,698	11.0820	$29,899	$75,000	$104,899
April	3,154	11.0600	$34,883	$75,000	$109,883

Table 6.3-2. (continued)

Month	Average Monthly Generation (MWh)	Average Monthly Value ($/MWh)	Average Monthly Generation Value ($)	Other Revenue Related to Power Sales[2]	Total Average Monthly Value
2021 THROUGH 2032 PERIOD (10 YEARS) (cont'd)					
May	3,359	11.0934	$37,263	$75,000	$112,263
June	2,927	11.1207	$32,550	$75,000	$107,550
July	2,834	11.1503	$31,600	$75,000	$106,600
August	2,277	11.1959	$25,493	$75,000	$100,493
September	317	11.2620	$3,570	$75,000	$78,570
October	0	11.2449	$0	$75,000	$75,000
November	83	11.1982	$929	$75,000	$75,929
December	535	11.1743	$5,978	$75,000	$80,978
Annual Average for 2021 through 2031	*21,200*	--	*$235,792*	--	*$1,135,792*
2032 THROUGH 2051 PERIOD (20 YEARS)					
January	1,128	31.62	$35,667	--	$35,667
February	1,887	27.00	$50,949	--	$50,949
March	2,698	23.22	$62,648	--	$62,648
April	3,154	24.48	$77,210	--	$77,210
May	3,359	25.56	$85,856	--	$85,856
June	2,927	30.74	$89,976	--	$89,976
July	2,834	32.22	$91,311	--	$91,311
August	2,277	32.98	$75,095	--	$75,095
September	317	34.41	$10,908	--	$10,908
October	0	32.92	$0	--	$0
November	83	30.07	$2,496	--	$2,496
December	535	32.00	$17,120	--	$17,120
Annual Average for 2032 through 2051	*21,200*	--	*$599,237*	--	*$599,237*
Weighted Annual Average for 2021 through 2051[3]	**21,200**	**--**	**$446,908**	**--**	**$743,908**

[1] Source: SSWD's Proposed Project Model Run of the Camp Far West Project Ops Model, which is in Exhibit E, Appendix E1, of SSWD's Application for New License, and post-processing.

[2] Other Revenues Related to Power Sales are annual payments from SMUD to SSWD, as described in Section 5.2.3.2.1.

[3] Weighted 33 percent for 2012 through 2032 period and 67 percent for the 2032 through 2051 period.

6.3.4 Power Benefits Based on Replacement Power

Using the assumptions in Section 5.2.5, based on a Proposed Project average annual generation of 21,200 MWh (Table 6.3-2) and EIA's 2018 cost per MWh of $46.50 cost of generation at a dispatchable natural gas fired conventional combined cycle facility, replacing Project power with such a facility would cost on average $985,800 per year.

6.4 Summary of SSWD's Proposed Project Costs and Power Benefits

Table 6.4-1 summarizes the Project's costs and power benefits under SSWD's Proposed Project, based on the information provided above.

Table 6.4-1. SSWD's estimate of average annual costs and power benefits in 2018 U.S. dollars under SSWD's Proposed Project.

Value	SSWD's Proposed Project
AVERAGE ANNUAL GROSS POWER BENEFITS	
Capacity	--
Installed[1]	6,800 kW
Dependable[2]	0 kW
Subtotal - Value in 2018 Dollars	*$0*
Energy[3]	21,200 MWh
Subtotal Energy[3]	*$743,908*
Subtotal - Value in 2018 Dollars[3]	*$743,908*
Total – Value in 2018 Dollars	**$743,908**
AVERAGE ANNUAL COSTS	
Non-Environmental/Recreational[4]	$1,210,443
Environmental/Recreational[5]	$442,600
Pool Raise[6]	$155,755
Total - Value in 2018 Dollars	**$1,808,798**
AVERAGE ANNUAL NET BENEFIT	
Total 2018 U.S. Dollars[7]	**-$1,064,890**

1 From Section 5.2.1.1.
2 From Section 5.2.1.3.
3 From Table 6.3-1.
4 Table 5.3-1
5 From Table 6.2.2.
6 From Section 6.1.
7 Calculate by subtracting total for Average Annual Costs from total for Average Annual Gross Power Benefits.

7.0 Changes in Project Power and Value

Table 7.0-1 compares the annual cost and power benefits of the No Action Alternative and SSWD's Proposed Project.

Table 7.0-1. Comparison of annual power benefits, costs net benefits between No Action Alternative and SSWD's Proposed Project.

Value	No Action Alternative[1]	SSWD's Proposed Project[2]	Change[3]
AVERAGE ANNUAL GROSS POWER BENEFITS			
Capacity	--	--	--
Installed	6,800 MW	6,800 MW	No Change
Dependable	0 MW	0 MW	No Change
Subtotal - Value in 2018 Dollars	--	--	--
Energy	20,752 MWh	21,200 MWh	+448 MWh
Subtotal - Value in 2018 Dollars	*$759,002*	*$743,908*	*-$15,904*
Total – Value in 2018 Dollars	**$759,002**	**$743,908**	**-$15,904**
AVERAGE ANNUAL COSTS			
Non-Environmental/Recreational	$1,210,443	$1,210,443	No Change
Addition of Pool Raise	--	$155,755	-$155,755
Environmental/Recreational	$312,933	$442,600	-$129,667
Total - Costs in 2018 Dollars	**$1,522,443**	**$1,808,798**	**-$286,355**
AVERAGE ANNUAL NET BENEFIT			
Total – Net Benefit in 2018 U.S. Dollars	**-$763,441**	**-$1,064,890**	**-$302,259**

1 From Table 5.3-1.
2 From Table 6.4-1.
3 Calculate by subtracting SSWD's Proposed Project value from the No Action Alternative value: a plus means an increase over the No Action Alternative and a minus means a decrease over the No Action Alternative.

Under SSWD's Proposed Project as compared to the No Action Alternative, no change in installed capacity would occur and dependable capacity remains 0 kW. Average annual energy generation would be increased by 2 percent (448 MWh) from 20,752 MWh to 21,200 MWh, with the greatest increase occurring in August. However, average annual energy benefits would be decreased by 21 percent ($15,904) from $759,002 to $743,908 due to shifting of the generation from months with higher energy prices (i.e., summer) to months with lower energy prices (i.e., spring). (Table 7.0-1.)

Under SSWD's Proposed Project as compared to the No Action Alternative, average annual Project costs would increase by $286,355 or 18.8 percent, with 54.4percent of the increased cost related to the new Pool Raise and 45.6 percent related to the new environmental and recreation conditions (Table 7.0-1).

The overall average annual Project net benefit would decrease by $302,259, or by 40.0 percent (Table 7.0-1). SSWD anticipated offsetting these Project shortfalls though water sales.

SSWD's Proposed Project would maintain the current installed capacity value of the Project and enhance a source of high-quality irrigation water to the region. SSWD's Proposed Project would also provide numerous environmental benefits, some of which include: enhancing fish habitat, which already supports robust and healthy anadromous fish populations; and providing the optimum development of recreational opportunity in the Project area consistent with the purpose of the Project.

8.0 Recognition of Trends in California Power Market

California wholesale power prices have been on a downward trend for several years, and low prices are anticipated to persist for at least a decade into the future. This low price trend is based on two basic trends, daily load and long term natural gas prices.

The CAISO tracks the "net" demand. The net demand curve (Figure 8.0-1) depicts the variability in demand and supply that the CAISO must counterbalance to maintain grid reliability. Net demand is calculated by taking the actual demand and subtracting the electricity produced by variable generation resources, wind and solar, which are directly connected to the CAISO grid. Higher levels of variable electricity generation increase the CAISO operational need for resources with the technological flexibility to start and stop quickly, and maintain output for set periods of time, so the CAISO can match supply and demand at all times.

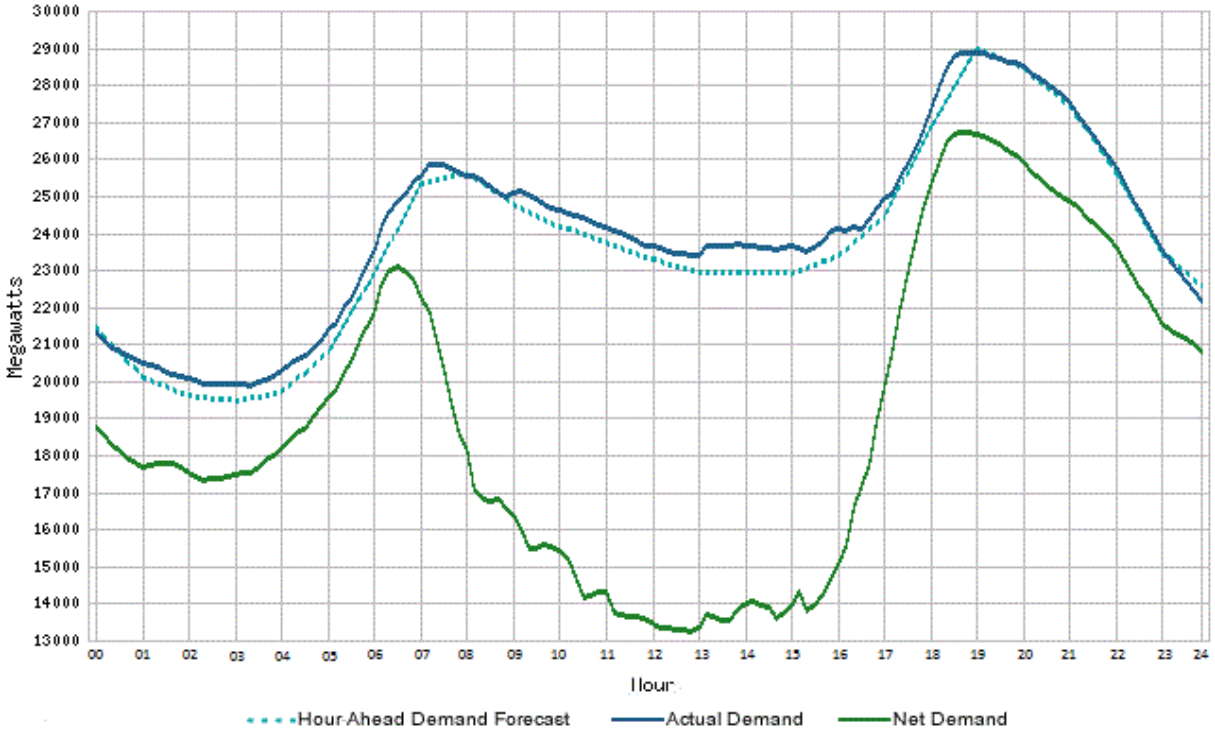

Figure 8.0-1. CAISO Net Load Curve - Mar 6 2017.
Source: http://www.caiso.com/Pages/TodaysOutlook.aspx

Decrease in net demand is driven by renewables penetration into the California grid. As the state moves towards a 50 percent renewables mandate, the downward pressure on net demand, and thus wholesale energy prices, will continue.

Energy prices in the CAISO market are set by the marginal generation resource, which is typically natural gas fired generation particularly during the net demand peaks between 5 and 8 A.M. and 4 and 10 P.M. Natural gas prices are low, and low prices, as evidenced by natural gas futures prices, are expected to stay low for several years (Figure 8.0-2).

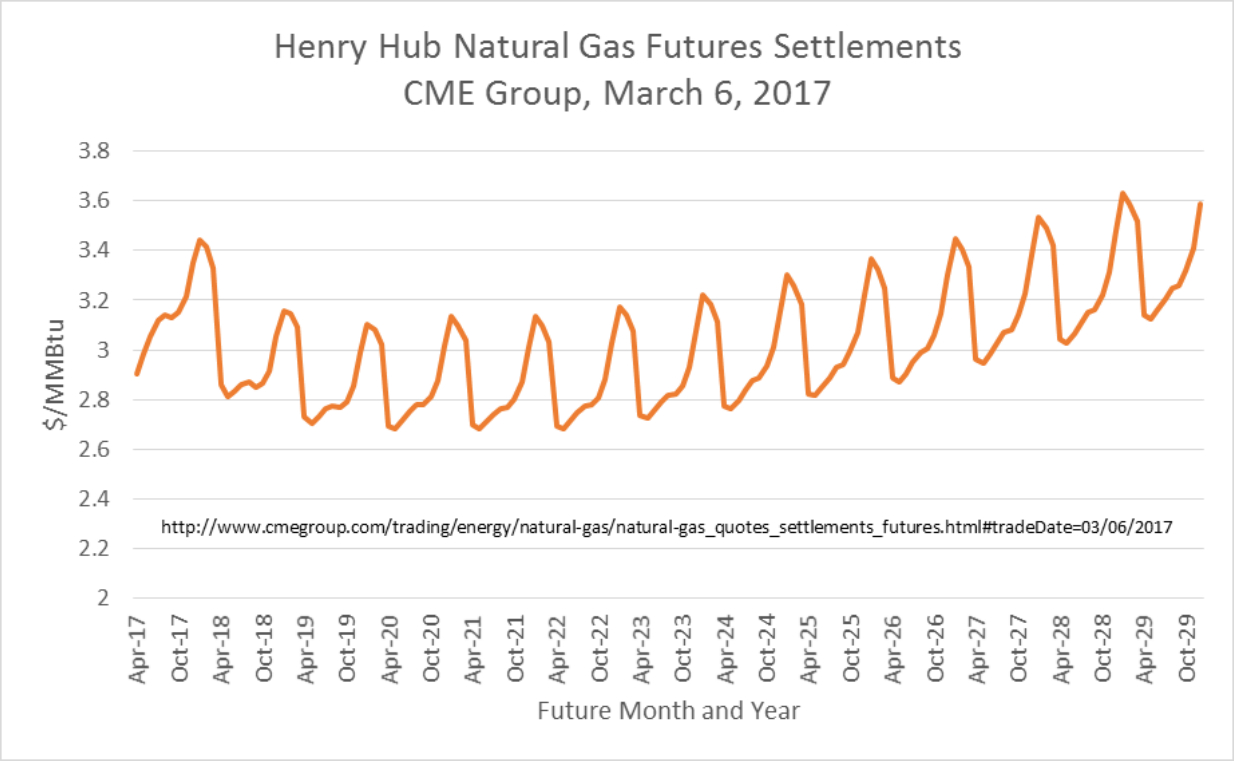

Figure 8.0-2. Natural gas futures through 2029.
Source: CME Group Futures Trading Platform, March 6, 2017 at http://www.cmegroup.com/trading/energy/natural-gas/natural-gas_quotes_settlements_futures.html#tradeDate=03/06/2017

The low price trend is reflected in the Energy Information Administration's (EIA) Annual Energy Outlook 2017, which includes a reference case forecast of generation prices. The EIA analysis includes contract, regulatory mandated and qualifying facility prices, as well as CAISO market prices, show a weighted average well above current CAISO market prices. However, the overall price trend is declining and flat, with prices declining over the next 5 years, then holding flat for many years into the future. (Figure 8.0-3.)

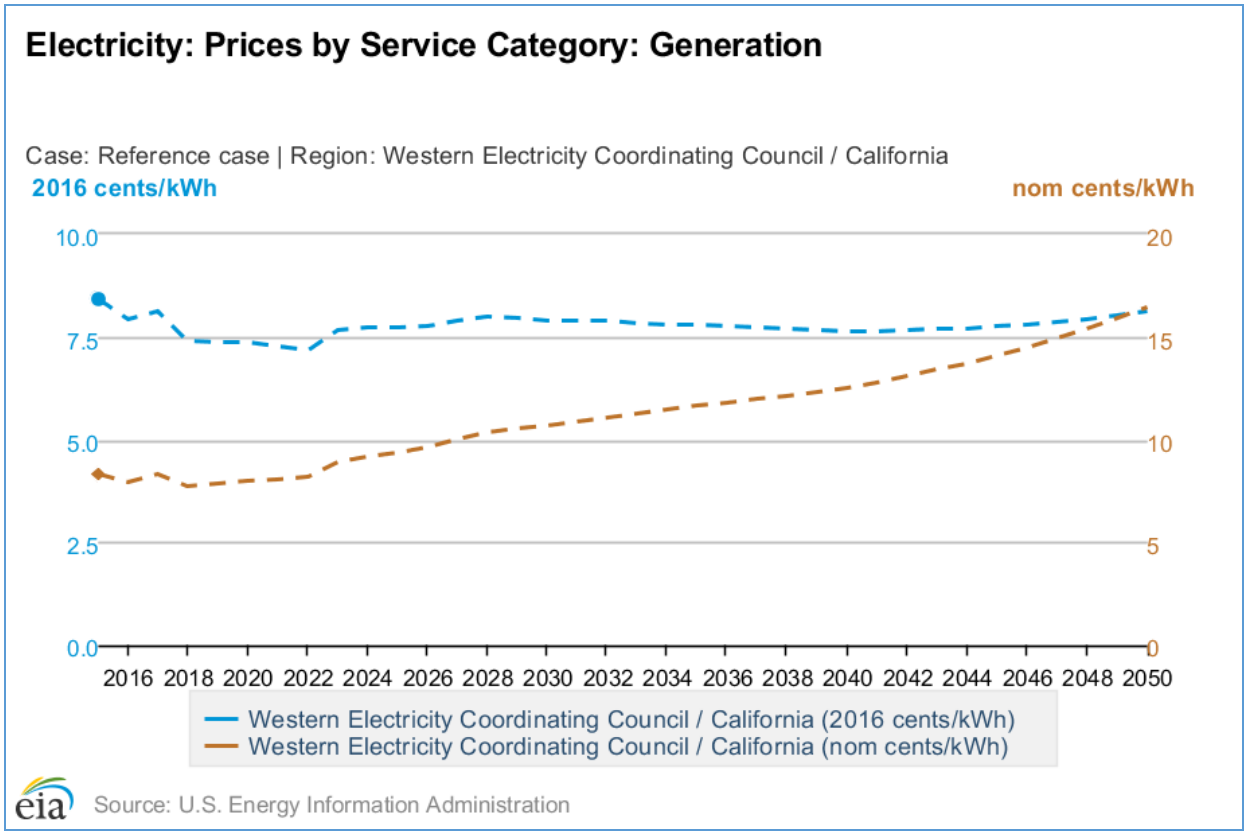

Figure 8.0-3. Anticipated relative future generation prices.
Source: Energy Information Agency, 2017. Annual Energy Outlook 2017. www.eia.gov/aeo.

9.0 Sources of Financing and Annual Revenues to Meet Project Costs

With the exception of the Pool Raise, SSWD anticipates financing Project O&M and all other components of the Proposed Project with Project power and water sales, and acquisition of federal and State grants. SSWD is financially able to do this. In support of this statement, SSWD refers to its history of operating the Project and the continued need for power and the many energy market opportunities in California, and for water in California. Historically, the power output was contracted to SMUD where SMUD paid all the bond repayment costs and the Project O&M and capital costs. This contract expires in 2031, unless terminated sooner. At that time, SSWD will enter into new power purchase contract(s).

SSWD anticipates financing the Pool Raise with a combination of funds, including SSWD power and water sales, and SSWD will seek State funds and federal financing for the Pool Raise.

10.0 Need for Power

The Project is located in the California-Mexico Power area of the WECC. According to the California Energy Commission (CEC), electricity consumption statewide is projected to grow at

an annual average compound rate of 1.2 percent from 2010 through 2020 (CEC 2009). SSWD's Proposed Project would continue to meet part of existing load requirements within the system, which is in need of resources. Power from the Project could help to meet a need for power in the WECC region in both the short-term and long-term. The Project would provide low-cost power that may displace non-renewable, fossil-fired generation and contribute to a diversified generation mix. Displacing the operation of fossil-fired facilities avoids some power plant emissions and creates an environmental benefit.

11.0 Other Developmental and Non-Developmental Benefits

This section describes other developmental and non-development benefits.

11.1 Irrigation

SSWD's primary purpose is to provide a reliable and affordable supply of irrigation water to its service area, which encompasses a total gross area of 63,972 acres (ac), of which 6,960 ac are excluded, for a net area of 57,012 ac. In a normal year, over 35,500 ac within SSWD's service area are under irrigation, with approximately 29,110 ac (82%) in rice production, 3,905 ac (11%) in orchards, 2,130 ac (6%) in irrigated pastures, and 355 ac (1%) in miscellaneous row and field crops. SSWD has done this by developing a distribution system to augment and provide alternatives to a declining groundwater table that was being tapped by private agricultural wells within SSWD's service area.

Today, the available water supply in Camp Far West Reservoir is totally allocated each year. However, the water supply still represents only a portion of SSWD's users' demands. Up to approximately 475 cfs of the water released from Camp Far West Reservoir is re-diverted from the Bear River during the irrigation season (i.e., typically, from mid-April through mid-October) at a 38-ft high diversion dam located approximately 1.25 miles (mi) downstream from Camp Far West Dam into SSWD's Main Canal, which is located on the south bank and runs predominately north to south along the higher eastern border of SSWD's service area. Approximately 40 cfs of that water is re-diverted from the first 0.5-mi of the Main Canal to the Camp Far West Irrigation District (CFWID) South Canal, with the remaining water going down the Main Canal to SSWD's customers. In addition, up to 35 cfs of Bear River water is diverted at the non-Project diversion dam into CFWID's North Canal. Typically, water deliveries begin low in mid-April, peak in July, and then gradually decrease through mid-October. Through turnouts and head gates, water is directed from SSWD's Main Canal into improved canals, one pipeline, and natural channels running from east to west, and distributed to water users. Depending upon the anticipated reservoir yield, the water user's allocations may range from 0 ac-ft per ac of irrigated land during a drought year to as much as 2.0 ac-ft per ac during a wet year. Perennial crops such as orchards and pasture receive a higher priority of allocation over seasonal crops, with rice growers receiving the lowest priority.

Besides serving its members within its service territory, SSWD provides up to 13,000 ac-ft of water to the other users. In accordance with a 1957 agreement and a 1973 settlement agreement,

SSWD provides to CFWID 13,000 ac-ft of water from the Camp Far West Reservoir each year to satisfy CFWID's senior water rights on the Bear River.

Lastly, the value of Camp Far West Reservoir as augmenting California's Central Valley's water supply was clearly recognized in 1967 when the reservoir was enlarged as part of the California State Water Plan.

11.2 Bay-Delta Contributions

In February 2000, SSWD, DWR and the CFWID entered into the Bear Agreement (DWR, SSWD and CFWID 2000) to settle the responsibilities of SSWD, CFWID, and all other Bear River water rights, to implement the objectives in the Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary adopted May 22, 1995 (1995 Bay-Delta Plan).

To incorporate this agreement into SSWD's water rights, in July 2000, the SWRCB issued Order 2000-10 that amended SSWD's Water Right Licenses 11120 and 11118 to provide that:

> During releases of water in connection with the change of purpose of use and place of use of up to 4,400 acre-ft transferred to DWR during dry and critical years,[ ] Licensee shall increase flows in the lower Bear River by no more than 37 cfs from July through September. To avoid stranding impacts to anadromous fish in the Bear River below Camp Far West Reservoir, Licensee shall, by the end of a release period from the reservoir in connection with said change, ramp down flows from the reservoir at a rate not to exceed 25 cfs over a 24-hour period.

The required flow volume is in addition to the minimum flow requirement in the Project license, and is measured immediately downstream of the diversion dam as spill, over the diversion dam. SWRCB's Order 2000-10 states that this arrangement would terminate upon the termination of the Bear River Agreement on December 31, 2035, or sooner if the Bear River agreement was terminated sooner.

12.0 Consequences of Denial of New License

If SSWD were not to receive a new license for the Project, SSWD would retain most Project facilities because they are used to providing irrigation water to SSWD's service territory and because SSWD holds the consumptive water rights for use of the Project Facilities. However, SSWD would not receive the energy revenue from the Project, which would result in higher costs to its customers for irrigation water, since Project revenues are used primarily to fund improvements to SSWD's irrigation water delivery system. In addition, the environmental and recreational benefits described above would not be realized.

13.0 List of Attachments

None.

14.0 References Cited

California Energy Commission (CEC). 2009. California Energy Commission, 2009 Integrated Energy Policy Report, Final Commission Report, CEC-100-2009-003-CMF, December 2009

California Public Utility Commission (CPUC). 2011. Market Price Referent http://www.cpuc.ca.gov/PUC/energy/Renewables/mpr KM

Department of Water Resources (DWR), South Sutter Water District (SSWD) and Camp Far West Irrigation District (CFWID). 2000. Bay-Delta Settlement Agreement Between the Department of Water Resources of the State of California, South Sutter Water District and Camp Far West Irrigation District. Available online: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/SVG/

Elliott, T. C., Chen, K., and Swanekamp, R. C. 1997. Standikard Handbook of Powerplant Engineering, Second Edition. McGraw-Hill October 1, 1997

Federal Energy Regulatory Commission (FERC). 2014. Final Environmental Impact Statement (FEIS) for the Upper Drum-Spaulding Hydroelectric Project No. 2310-193, the Lower Drum Hydroelectric Project No. 14531-000, Deer Creek Hydroelectric Project No. 14530-000, and the Yuba-Bear Hydroelectric Project No. 2266-102, December 2014.

_____. Office of Hydropower Relicensing. 1995. Order Issuing New License, Mead Corporation. Project No. 2506. Washington, DC.

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Application for New License
Major Project – Existing Dam

Exhibit F
General Design Drawings

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997

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June 2019

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None.

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Attachment F-1 General Design Drawings (CEII)

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EXHIBIT F

GENERAL DESIGN DRAWINGS

1.0 Introduction

The South Sutter Water District (SSWD or Licensee) has prepared this Exhibit F, General Design Drawings, as part of its Application for a New License Major Project – Existing Dam – (Application) from the Federal Energy Regulatory Commission (FERC or Commission) for the Camp Far West Hydroelectric Project, FERC Project Number (No.) 2997 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Traditional Licensing Process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Sections 4.41(g) and 4.39. Section 4.41(g) pertains to Project maps and Section 4.39 provides specifications for maps and drawings. As a reference, these two sections state:

18 C.F.R. §4.41(g): Exhibit F consists of general design drawings of the principal project works described under paragraph (b) of this section (Exhibit A) and supporting information used as the basis of design. If the Exhibit F submitted with the application is preliminary in nature, applicant must so state in the application. The drawings must conform to the specifications of § 4.39.

(1) The drawings must show all major project structures in sufficient detail to provide a full understanding of the project, including:
   (i) Plans (overhead view);
   (ii) Elevations (front view);
   (iii) Profiles (side view); and
   (iv) Sections.

(2) The applicant may submit preliminary design drawings with the application. The final Exhibit F may be submitted during or after the license process and must show the precise plans and specifications for proposed structures. If the project is licensed on the basis of preliminary designs, the applicant must submit the final Exhibit F for Commission approval prior to the commencement of any construction of the project.

(3) Supporting design report. The applicant must furnish, at a minimum, the following supporting information to demonstrate that existing and proposed structures are safe and adequate to fulfill their stated functions, and must submit such information in a separate report at the time the application is filed. The report must include:
   (i) An assessment of the suitability of the site and the reservoir rim stability based on geological and subsurface investigations, including investigations of soils and rock borings and tests for the evaluation of all foundations and construction materials sufficient to determine the location and type of dam structures suitable for the dam site;
   (ii) Copies of all boring logs, geology reports and laboratory tests reports;
   (iii) An identification of all borrow areas and quarry sites and an estimate of required quantities and suitable construction material;
   (iv) Stability and stress analyses for all major structures and critical abutment slopes under all probable loading conditions, including seismic and hydrostatic forces induced by water loads up to the Probable Maximum Flood as appropriate; and
   (v) The basis for determination of seismic loading and the Spillway Design Flood in sufficient detail to permit independent staff evaluation.

(4) The applicant must submit two copies of the supporting design report described in paragraph (g)(3) of this section at the time preliminary and final design drawings are submitted to the Commission for review. If the report contains preliminary drawings, it must be designated a "Preliminary Supporting Exhibit Report."

18 C.F.R. §4.39: Specifications for maps and drawings. All required maps and drawings must conform to the following specifications, except as otherwise prescribed in this chapter:

(a) Each original map or drawing must consist of a print on silver or gelatin 35mm microfilm mounted on Type D (3 1/4" by 7 3/8") aperture cards. Full-sized prints of maps and drawings must be on sheets no smaller than 24 by 36 inches and no larger than 28 by 40 inches. A space five inches high by seven inches wide must be provided in the lower right hand corner of each sheet. The upper half of this space must bear the title, numerical and graphical scale, and other pertinent information concerning the map or drawing. The lower half of the space must be left clear. Exhibit G drawings must be stamped by a Registered Land Surveyor. If the drawing size specified in this paragraph limits the scale of structural drawings (exhibit F drawings) described in paragraph (c) of this Section, a smaller scale may be used for those drawings. Potential applicants or licensees may be required to file maps or drawings in electronic format as directed by the Commission.

(b) Each map must have a scale in full-sized prints no smaller than one inch equals 0.5 miles for transmission lines, roads, and similar linear features and no smaller than one inch equals 1,000 feet for other project features, including the project boundary. Where maps at this scale do not show sufficient detail, large scale maps may be required. Each map must show:

(1) True and magnetic meridians;

(2) State, county, and town lines; and

(3) Boundaries of public lands and reservations of the United States [see 16 U.S.C. 796 (1) and (2)], if any. If a public land survey is available, the maps must show all lines of that survey crossing the project area and all official subdivisions of sections for the public lands and reservations, including lots and irregular tracts, as designated on the official plats of survey that may be obtained from the Bureau of Land Management, Washington, D.C., or examined in the local land survey office; to the extent that a public land survey is not available for public lands and reservations of the United States, the maps must show the protractions of townships and section lines, which, if possible, must be those recognized by the Federal agency administering those lands.

(c) Drawings depicting details of project structures must have a scale in full-sized prints no smaller than:

(1) One inch equals 50 feet for plans, elevations, and profiles; and

(2) One inch equals 10 feet for sections.

(d) Each map or drawing must be drawn and lettered to be legible when it is reduced to a print that is 11 inches on its shorter side. Following notification to the applicant that the application has been accepted for filing [see §4.31(c)], prints reduced to that size must be bound in each copy of the application which is required to be submitted to the Commission or provided to any person, agency, or other entity.

(e) The maps and drawings showing project location information and details of project structures must be filed in accordance with the Commission's instructions on submission of Critical Energy Infrastructure Information in §§388.112 and 388.113 of subchapter X of this chapter.

Besides this introductory material, this Exhibit F includes three sections. Section 2.0 provides a list of all design drawings needed to show all major Project structures in sufficient detail to provide a full understanding of the Project. These include Plan, elevation and section profiles. Section 3.0 addresses the use of the SSWD's Part 12 Independent Safety Inspection Reports to meet the requirements for a Supporting Design Report for existing Project facilities. Section 4.0 provides information regarding the attachment to this Exhibit F.

See Exhibit A for a description of Project facilities and features, Exhibit B for a description of Project operations, Exhibit C for construction history and construction schedule, Exhibit D for costs and financing information, and Exhibit E for a discussion of potential environmental effects and SSWD's proposed resource management measures. Project maps are included in Exhibit G. Exhibit H contains a detailed description of the need for the electricity provided by the Project, the availability of electrical energy alternatives, and other miscellaneous information.

All elevation data in this Exhibit are in National Geodetic Vertical Datum of 1929 (NGVD29), unless otherwise specified.

2.0 General Design Drawings

Exhibit F General Design Drawings for the Project depict the primary Project components described in Exhibit A. The Exhibit F design drawings are designated Critical Energy/Electric Infrastructure Information (CEII) and are filed only with the Federal Energy Regulatory Commission (FERC). Drawings F-1, F-2 and F-3 provide plan, elevation, profiles and sections in accordance with the requirements of 18 C.F.R. § 4.41(g), and were developed primarily from FERC-approved Exhibit F drawings, which depict the as-built principal Project works. Drawing F-4 is a single-line electric diagram of the Project. Table 2.0-1 presents a listing of the Exhibit F drawings being filed with FERC as CEII in support of this application for subsequent license.

Table 2.0-1. Exhibit F Drawings.

Exhibit F Drawing No.	Drawing Title
F-1	Existing and Proposed Facilities
F-2	Powerhouse Plans and Sections
F-3	Plans and Sections – Dike and Wing Dams
F-4	Single-Line Electric Diagram

After the Pool Raise is complete, SSWD will file with the Commission revised and new Exhibit F drawings showing the inclusion of the Pool Raise in the Project. Refer to Figures 5.1-1, 5.1-2, 5.1-3 and 5.1-4 in Exhibit A for a conceptual design of the Pool Raise.

3.0 Supporting Design Report for Existing Facilities

Sections 4.41(g)(2) require that an applicant file with FERC two copies of a Supporting Design Report when the applicant files a license application. The purpose of the Supporting Design Report is to demonstrate "*…that existing and proposed structures are safe and adequate to fulfill their stated functions.*…" SSWD's recent Part 12 Independent Dam Safety Inspection Reports fulfill the requirements of the regulations for filing a Supporting Design Report for existing Project facilities as part of the Application for New License. All of the Project's Independent Dam Safety Inspection Reports are on file with FERC.

4.0 Supporting Design Report for the Pool Raise

With regards to the Pool Raise, SSWD is in the process of conducting geotechnical investigation to support the Pool Raise. These include design-level investigations performed near the footprint of the new spillway, which includes areas upstream and downstream of the concrete structure where excavation of overburden material is anticipated. The work, as described in Exhibit C of this FLA, will include the following subtasks:

- Geotechnical Field Investigation Report
- Geotechnical Design Recommendation Report

SSWD anticipates that these investigations will be complete within 1 year of license issuance and SSWD will file with the Commission a Supporting Design Report for the Pool Raise within 2 years of license issuance.

5.0 List of Attachments

Attachment F-1 General Design Drawings (CEII)

6.0 References Cited

None.

Attachment F-1

General Design Drawings (PDF)

In accordance with Section 5.30 and 4.32(k) of FERC's regulations, and in light of heightened national security concerns, SSWD requests that the General Design Drawings included in Attachment F-1 be treated by FERC as Critical Energy Infrastructure Information (CEII) under § 388.112 of FERC's regulations, and not be released to the public.

The material satisfies the definition of CEII in § 388.112(c) of FERC's regulations because they contain detailed design information about existing critical infrastructure that relates details about the generation and transmission of electrical energy, and could be useful to a person planning an attack on critical infrastructure. Moreover, such information is exempt from disclosure under the freedom of Information Act 5 U.S.C. § 552, and does not simply give the general location of the critical infrastructure.

Procedures for the public to obtain access to CEII may be found at 18 C.F.R. § 388.113. Requests for access should be made to FERC's CEII Coordinator.

Application for New License
Major Project – Existing Dam

Exhibit G
Project Maps

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997

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June 2019

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Attachment G-2	GIS Shapefiles of Proposed Project Boundary, Private Lands within Proposed Project Boundary, and Exhibit G Map Reference Points

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EXHIBIT G

PROJECT MAPS

1.0 Introduction

The South Sutter Water District (SSWD or Licensee) has prepared this Exhibit G, Project Maps, as part of its Application for a New License Major Project – Existing Dam – (Application) from the Federal Energy Regulatory Commission (FERC or Commission) for the Camp Far West Hydroelectric Project, FERC Project Number (No.) 2997 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Traditional Licensing Process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Sections 4.41(h) and 4.39. Section 4.41(h) pertains to Project maps and Section 4.39 provides specifications for maps and drawings. As a reference, these two sections state:

18 C.F.R. § 4.41(h): Exhibit G is a map of the project that must conform to the specifications of § 4.39. In addition, to the other components of Exhibit G, the applicant must provide the project boundary data in a geo-referenced electronic format - such as ArcView shape files, GeoMedia files, MapInfo files, or any similar format. The electronic boundary data must be positionally accurate to ± 40 feet, in order to comply with the National Map Accuracy Standards for maps at a 1:24,000 scale (the scale of USGS quadrangle maps). The electronic Exhibit G data must include a text file describing the map projection used (*i.e.*, UTM, State Plane, Decimal Degrees, etc.), the map datum (*i.e.*, feet, meters, miles, etc.). Three sets of the maps must be submitted on compact disk or other appropriate electronic media. If more than one sheet is used for the paper maps, the sheets must be numbered consecutively, and each sheet must bear a small insert sketch showing the entire project and indicate that portion of the project depicted on that sheet. Each sheet must contain a minimum of three known reference points. The latitude and longitude coordinates, or state plane coordinates, of each reference point must be shown. If at any time after the application is filed there is any change in the project boundary, the applicant must submit, within 90 days following the completion of project construction, a final exhibit G showing the extent of such changes. The map must show:

(1) *Location of the project and principal features.* The map must show the location of the project as a whole with reference to the affected stream or other body of water and, if possible, to a nearby town or any other permanent monuments or objects, such as roads, transmission lines or other structures, that can be noted on the map and recognized in the field. The map must also show the relative locations and physical interrelationships of the principal project works and other features described under paragraph (b) of this section (Exhibit A).

(2) *Project boundary.* The map must show a project boundary enclosing all project works and other features described under paragraph (b) of this section (Exhibit A) that are to be licensed. If accurate survey information is not available at the time the application is filed, the applicant must so state, and a tentative boundary may be submitted. The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources (*see* paragraph (f) of this section (Exhibit E)). Existing residential, commercial, or other structures may be included within the boundary only to the extent that underlying lands are needed for project purposes (e.g., for flowage, public recreation, shoreline control, or protection of environmental resources). If the boundary is on land covered by a public survey, ties must be shown on the map at sufficient points to permit accurate platting of the position of the boundary relative to the lines of the public land survey. If the lands are not covered by a public land survey, the best available legal description of the position of the boundary must be provided, including distances and directions from fixed monuments or physical features. The boundary must be described as follows:

(i) *Impoundments.*

(A) The boundary around a project impoundment must be described by one of the following:

(1) Contour lines, including the contour elevation (preferred method);

(2) Specified courses and distances (metes and bounds);

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must be located no more than 200 feet (horizontal measurement) from the exterior margin of the reservoir, defined by the normal maximum surface elevation, except where deviations may be necessary in describing the boundary according to the above methods or where additional lands are necessary for project purposes, such as public recreation, shoreline control, or protection of environmental resources.

(ii) *Continuous features.* The boundary around linear ("continuous") project features such as access roads, transmission lines, and conduits may be described by specified distances from center lines or offset lines of survey. The width of such corridors must not exceed 200 feet unless good cause is shown for a greater width. Several sections of a continuous feature may be shown on a single sheet with information showing the sequence of contiguous sections.

(iii) *Noncontinuous features.*

(A) The boundary around noncontinuous project works such as dams, spillways, and powerhouses must be described by one of the following:

(1) Contour lines;

(2) Specified courses and distances;

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must enclose only those lands that are necessary for safe and efficient operation and maintenance of the project or for other specified project purposes, such as public recreation or protection of environmental resources.

(3) *Federal lands.* Any public lands and reservations of the United States ("Federal lands") [*see* 16 U.S.C. 795(1) and (2)] that are within the project boundary, such as lands administered by the U.S. Forest Service, Bureau of Land Management, or National Park Service, or Indian tribal lands, and the boundaries of those Federal lands, must be identified as such on the map by:

(i) Legal subdivisions of a public land survey of the affected area (a protraction of identified township and section lines is sufficient for this purpose); and

(ii) The Federal agency, identified by symbol or legend, that maintains or manages each identified subdivision of the public land survey within the project boundary; or

(iii) In the absence of a public land survey, the location of the Federal lands according to the distances and directions from fixed monuments or physical features. When a Federal survey monument or a Federal bench mark will be destroyed or rendered unusable by the construction of project works, at least two permanent, marked witness monuments or bench marks must be established at accessible points. The maps show the location (and elevation, for bench marks) of the survey monument or bench mark which will be destroyed or rendered unusable, as well as of the witness monuments or bench marks. Connecting courses and distances from the witness monuments or bench marks to the original must also be shown.

(iv) The project location must include the most current information pertaining to affected Federal lands as described under §4.81(b)(5).

(4) *Non-Federal lands.* For those lands within the project boundary not identified under paragraph (h)(3) of this section, the map must identify by legal subdivision:

(i) Lands owned in fee by the applicant and lands that the applicant plans to acquire in fee; and

(ii) Lands over which the applicant has acquired or plans to acquire rights to occupancy and use other than fee title, including rights acquired or to be acquired by easement or lease.

18 C.F.R. §4.39: Specifications for maps and drawings. All required maps and drawings must conform to the following specifications, except as otherwise prescribed in this chapter:

(a) Each original map or drawing must consist of a print on silver or gelatin 35mm microfilm mounted on Type D (3 1/4" by 7 3/8") aperture cards. Full-sized prints of maps and drawings must be on sheets no smaller than 24 by 36 inches and no larger than 28 by 40 inches. A space five inches high by seven inches wide must be provided in the lower right hand corner of each sheet. The upper half of this space must bear the title, numerical and graphical scale, and other pertinent information concerning the map or drawing. The lower half of the space must be left clear. Exhibit G drawings must be stamped by a Registered Land Surveyor. If the drawing size specified in this paragraph limits the scale of structural drawings (exhibit F drawings) described in paragraph (c) of this Section, a smaller scale may be used for those drawings. Potential applicants or licensees may be required to file maps or drawings in electronic format as directed by the Commission.

(b) Each map must have a scale in full-sized prints no smaller than one inch equals 0.5 miles for transmission lines, roads, and similar linear features and no smaller than one inch equals 1,000 feet for other project features, including the project boundary. Where maps at this scale do not show sufficient detail, large scale maps may be required. Each map must show:

(1) True and magnetic meridians;

(2) State, county, and town lines; and

(3) Boundaries of public lands and reservations of the United States [see 16 U.S.C. 796 (1) and (2)], if any. If a public land survey is available, the maps must show all lines of that survey crossing the project area and all official subdivisions of sections for the public lands and reservations, including lots and irregular tracts, as designated on the official plats of survey that may be obtained from the Bureau of Land Management, Washington, D.C., or examined in the local land survey office; to the extent that a public land survey is not available for public lands and reservations of the United States, the maps must show the protractions of townships and section lines, which, if possible, must be those recognized by the Federal agency administering those lands.

(c) Drawings depicting details of project structures must have a scale in full-sized prints no smaller than:

(1) One inch equals 50 feet for plans, elevations, and profiles; and

(2) One inch equals 10 feet for sections.

(d) Each map or drawing must be drawn and lettered to be legible when it is reduced to a print that is 11 inches on its shorter side. Following notification to the applicant that the application has been accepted for filing [see §4.31(c)], prints reduced to that size must be bound in each copy of the application which is required to be submitted to the Commission or provided to any person, agency, or other entity.

(e) The maps and drawings showing project location information and details of project structures must be filed in accordance with the Commission's instructions on submission of Critical Energy Infrastructure Information in §§388.112 and 388.113 of subchapter X of this chapter.

Besides this introductory material, this Exhibit G includes four sections. Section 2.0 provides a description of how SSWD prepared the Project maps. Section 3.0 provides a list of all Project maps proposed for inclusion in the new license. The maps are included in Attachment G-1 to this exhibit. Sections 4.0 provides a list of references.

See Exhibit A for a description of Project facilities and features, Exhibit B for a description of Project operations, Exhibit C for a construction history and a construction schedule, Exhibit D for costs and financing information, and Exhibit E for a discussion of potential environmental effects and SSWD's proposed resource management measures. Design drawings are included in Exhibit F. Exhibit H contains a detailed description of the need for the electricity provided by the Project, the availability of electrical energy alternatives, and other miscellaneous information.

All elevation data in this exhibit are in National Vertical Datum of 1988 (NAVD88) unless otherwise specified.

2.0 Description of Data Presented in Project Maps

In an attempt to use the best data available to prepare the Project maps, multiple data sources were queried. Data sources and the process used by SSWD to develop the Exhibit G Project Boundary maps provided in this exhibit are discussed below.

Project maps were developed using Geographic Information Systems (GIS).

The existing FERC Project Boundary did not previously exist in a digital or geo-referenced format. The existing FERC Project Boundary was depicted on 1 hardcopy Exhibit G map, which is part of the existing FERC license. On that map, the boundary is described by surveyed coordinates, offsets and angles referenced to Public Land Survey System coordinates.

SSWD GIS technicians developed the boundary both by entering the boundary's coordinate geometry (COGO) in AutoCAD, by referencing Yuba, Nevada, and Placer County parcel mapping information. COGO was obtained from bearings and distances described by the original survey as recorded according to all the available recorded documents, Records of Surveys, public land surveys, and hardcopy Exhibit G map survey descriptions.

Additionally, land ownership parcels within the existing FERC Project Boundary and adjoining areas were reviewed and updated as necessary such that all the relevant parcel boundaries were correctly depicted. The Project Boundary and parcels were developed within a projected coordinate system and, as such, were geo-referenced and attributed for display on the map figures attached to this exhibit. All available recorded documents, Record of Survey data from multiple counties and other ownership data provided by SSWD for use on these maps, were used to update and validate the parcel base. It was then joined with the County Assessors data for ownership verification.

Once the existing Project Boundary and the ownership parcel base were defined digitally, properly referenced and verified, updates and changes to the existing FERC Project Boundary that are proposed in Exhibit A, Section 5.3 of this Application for New License were integrated into the boundary to develop the proposed FERC Project Boundary. Reasons for the proposed changes fall into the following categories:

- Changes Related to Project Operation and Maintenance (O&M). Proposed addition of lands to the Project Boundary that are currently utilized with a preponderance of use related to the Project O&M, and proposed removal of lands from the Project Boundary that do not have Project facilities and are not used or necessary for Project O&M. These proposed changes are essentially making corrections to the Project Boundary.
- Changes Related to Reservoir/Impoundment Contour. Proposed changes to the FERC Project Boundary around the Project reservoir and impoundments from surveyed coordinates to a contour located above the normal maximum water surface elevation (NMWSE). These changes are proposed according to the preferred method of defining new project boundaries as outlined in the FERC Drawing Guide (FERC 2014) and as it is a better representation of lands required for Project O&M around the Project reservoir.

The proposed specific changes are listed in Table 2.0-1.

Table 2.0-1. Summary of proposed changes to the existing FERC Project Boundary.

Proposed Change	Figure 2.0-1, Sheet #
PROJECT O&M	
Removal of the area that is west of the spillway and south of Blackford Road. Note that the area of the new Spillway Modification to the Bear River is retained in the proposed Project Boundary with a 15 ft buffer.	Sheet 1
Addition of the area on private land (APN: 018020015000) 70 ft from centerline of powerhouse access road.	Sheet 1
Removal of area owned by SSWD north of the entrance station and north of Camp Far West Road.	Sheet 2
Removal area owned by SSWD adjacent to the North Shore Recreation Area (NSRA), extending south around the sewage pond and water treatment facility which is not used by SSWD for recreation.	Sheets 2,3 & 4
Addition of the area between the existing FERC boundary and Camp Far West Road that is being used as part of the NSRA.	Sheet 3
RESERVOIR CONTOUR	
Removal of area owned by SSWD and more than 200 ft away from the Project reservoir along Camp Far West Road.	Sheet 2
Removal of the areas north along three unnamed tributaries which are more than 200 ft from the Project reservoir.	Sheet 3
Removal of the area along Rock Creek on private land (APN: 5402028000) which is more than 200 ft from the Project reservoir.	Sheet 5
Removal of the area owned by SSWD south of McCourtney Road along an unnamed tributary which is more than 200 ft from the Project reservoir.	Sheet 5
Addition of the area on private lands (APNs: 015390007000 and 5403009000) north of the current FERC boundary up to the 320 ft contour.	Sheet 6
Addition of the area on private lands (APNs: 5403010000 and 5403015000) north of the current FERC boundary up to the 320 ft contour.	Sheets 7 & 8
Addition of areas owned by SSWD south of the current FERC boundary up to the 320 ft contour.	Sheet 7
Removal of the areas owned by SSWD east and west of Valley Road along unnamed tributaries which are more than 200 ft from the Project reservoir.	Sheet 7 & 9
Addition of the area on private land (APN: 5403013000) north of the current FERC boundary up to the 320 ft contour.	Sheet 8
Addition of the areas owned by SSWD along the current FERC boundary up to the 320 ft contour.	Sheet 8
Addition of the area on private land (APN: 026010003000) south of the current FERC boundary up to the 320 ft contour.	Sheet 8
Addition of the area owned by SSWD bounded by the 320 ft contour and extending 200 ft along the Bear River upstream of the Project reservoir.	Sheet 8
Removal of the areas owned by SSWD north of North Forbes Road along unnamed tributaries which are more than 200 ft from the Project reservoir.	Sheet 9

Changes to the existing FERC Project Boundary are illustrated and described in detail and by area in Figure 2.0-1 (10 sheets). Proposed boundary additions are shaded in dark green and proposed subtractions are indicated with red hatching. Where proposed additions occur on private lands, they are indicated with grey cross hatching and the APN number is provided. Callout boxes in Figure 2.0-1 clearly identify where "Proposed Additions" to the existing FERC Project Boundary are located: the legend entry "Proposed Additions" clearly indicates if the features are present in the specific map sheet, and callouts on the map identify their exact locations.

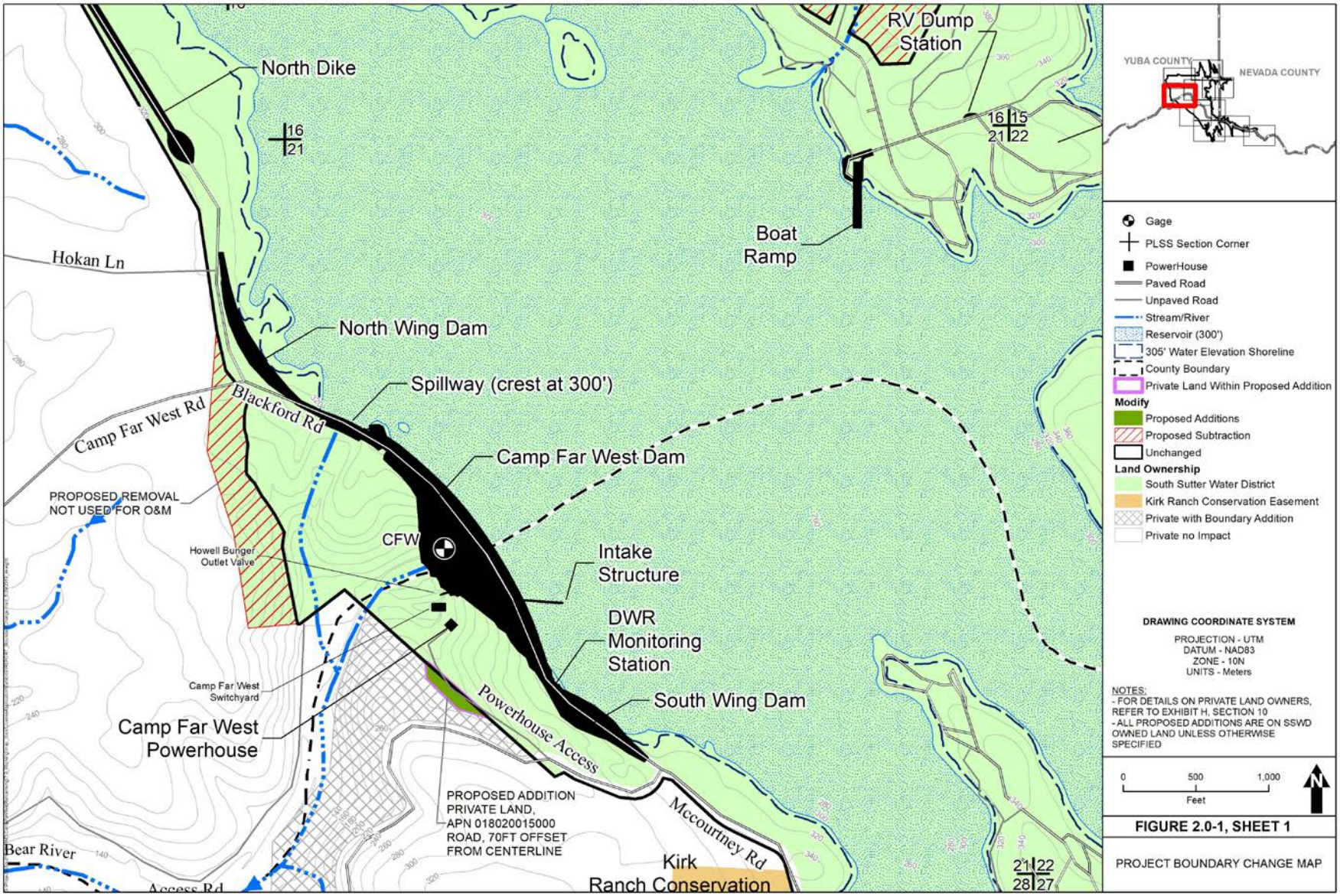


Figure 2.0-1. Sheet 1. Project Boundary Change Map.

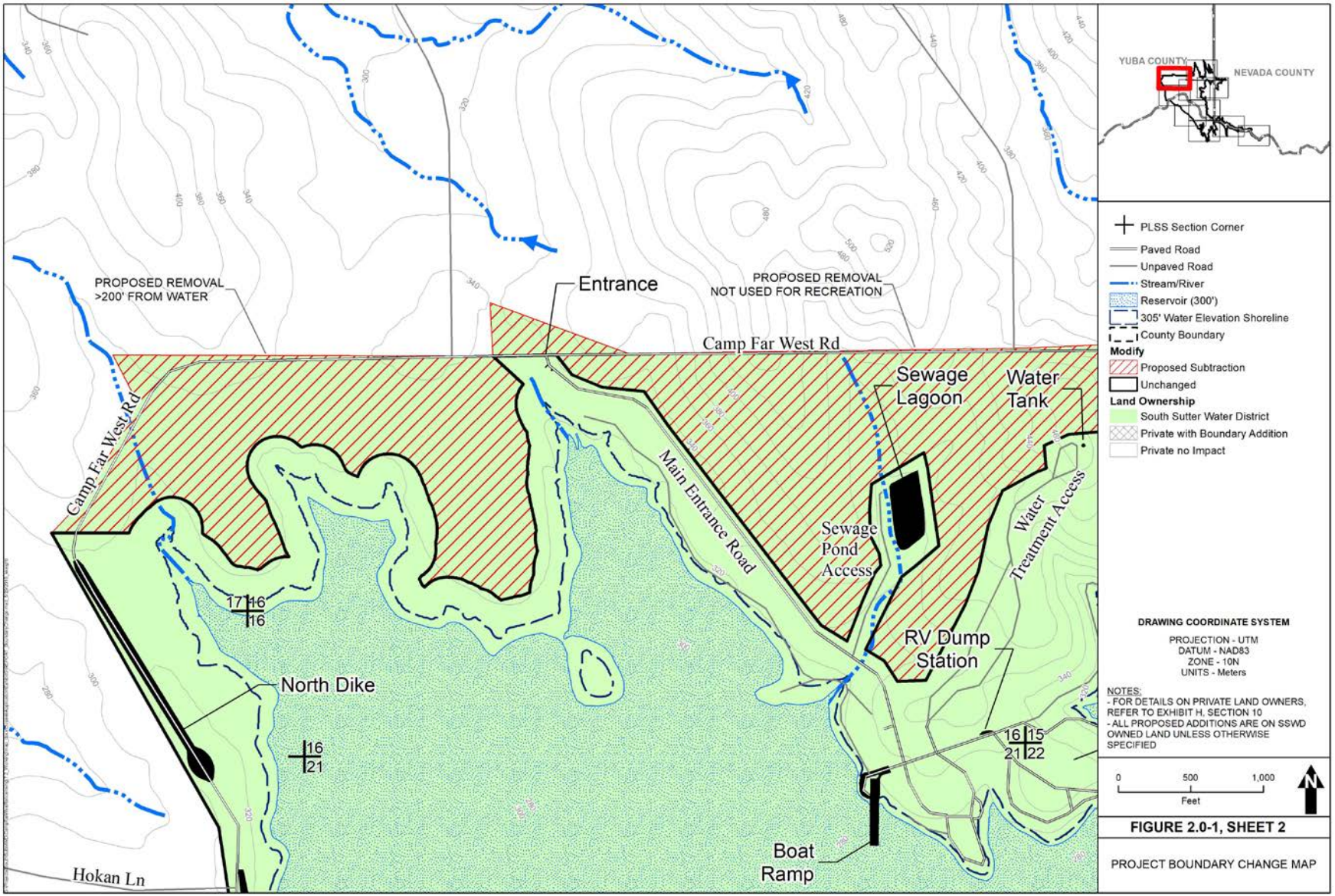


Figure 2.0-1. Sheet 2. Project Boundary Change Map.

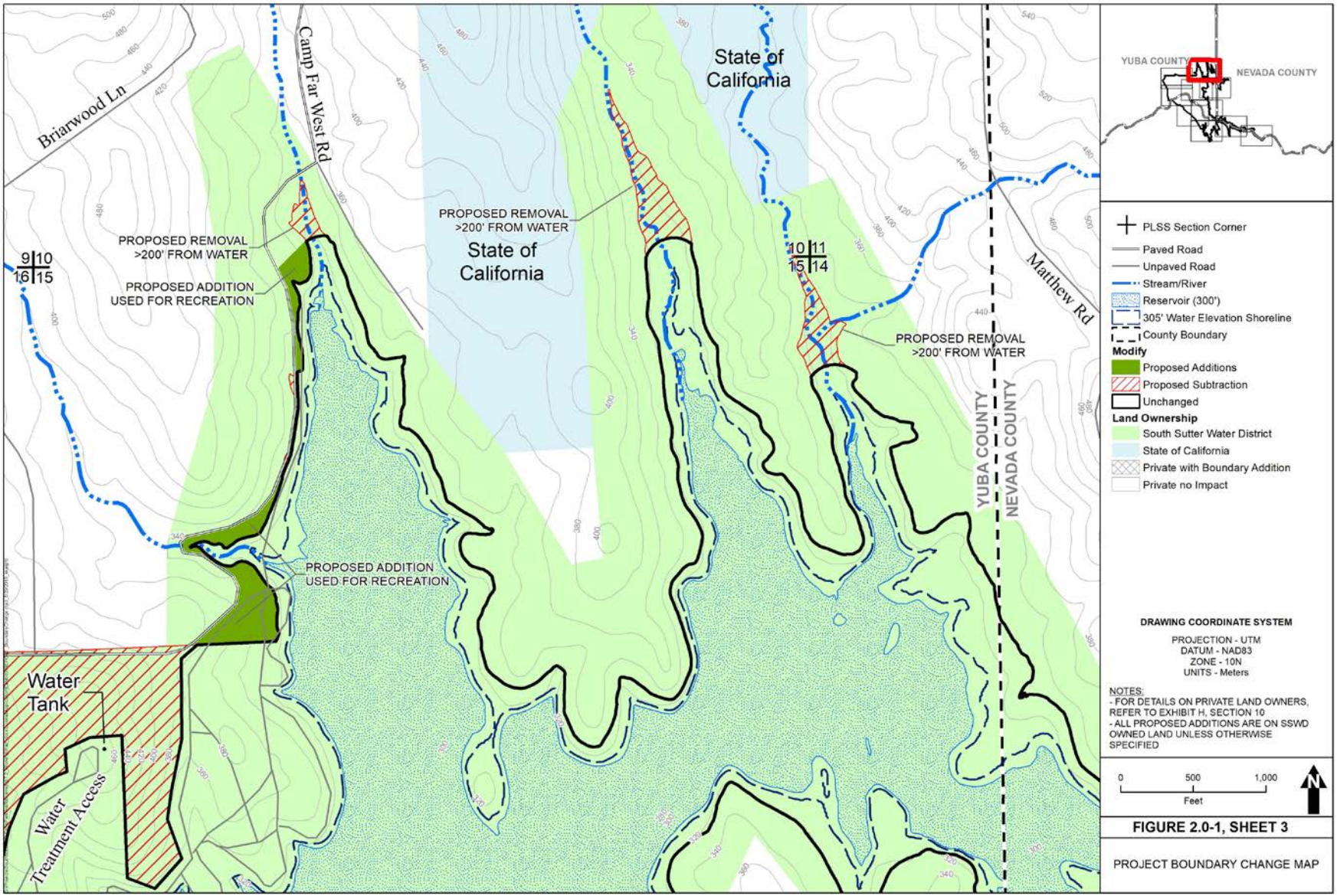


Figure 2.0-1. Sheet 3. Project Boundary Change Map.

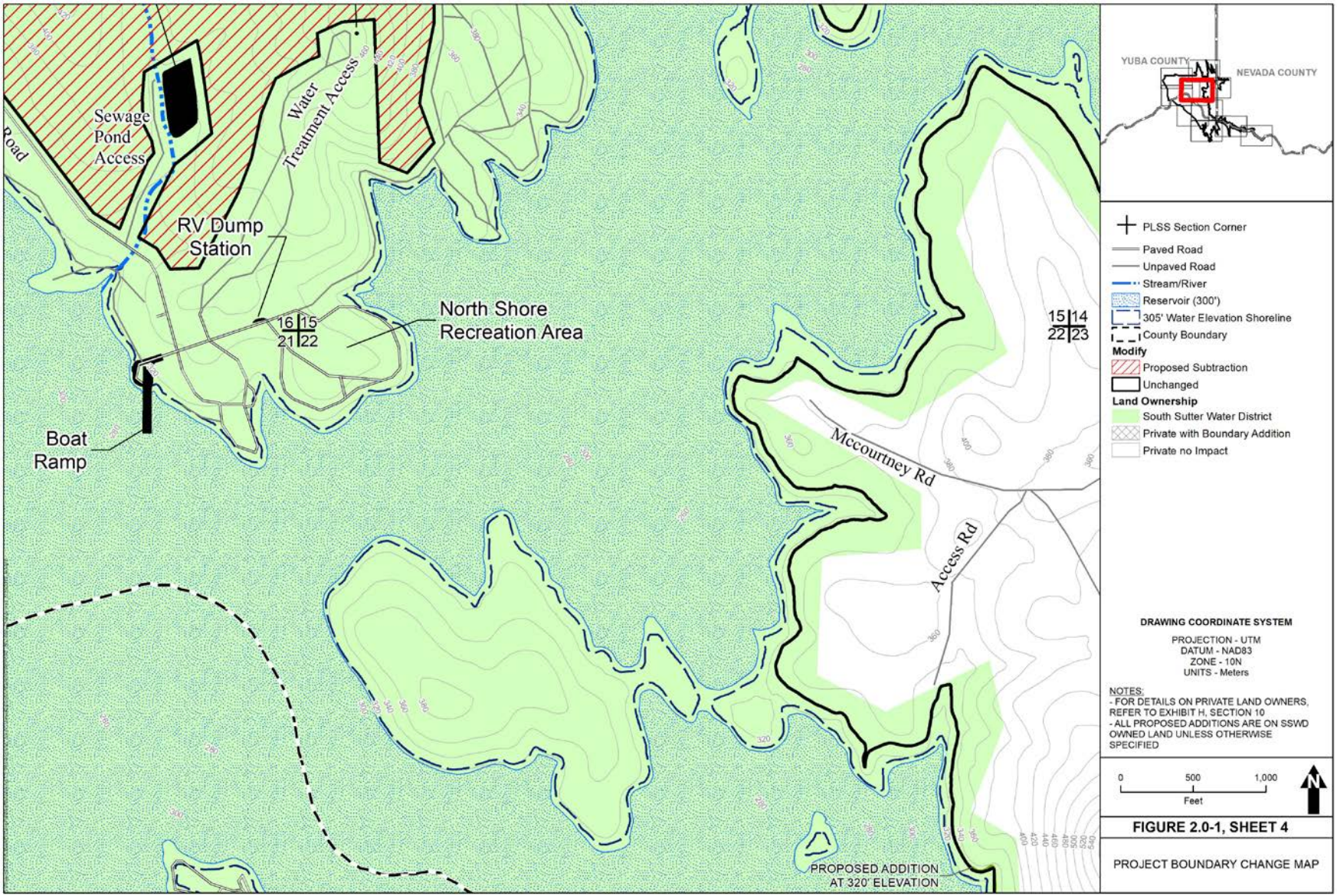


Figure 2.0-1. Sheet 4. Project Boundary Change Map.

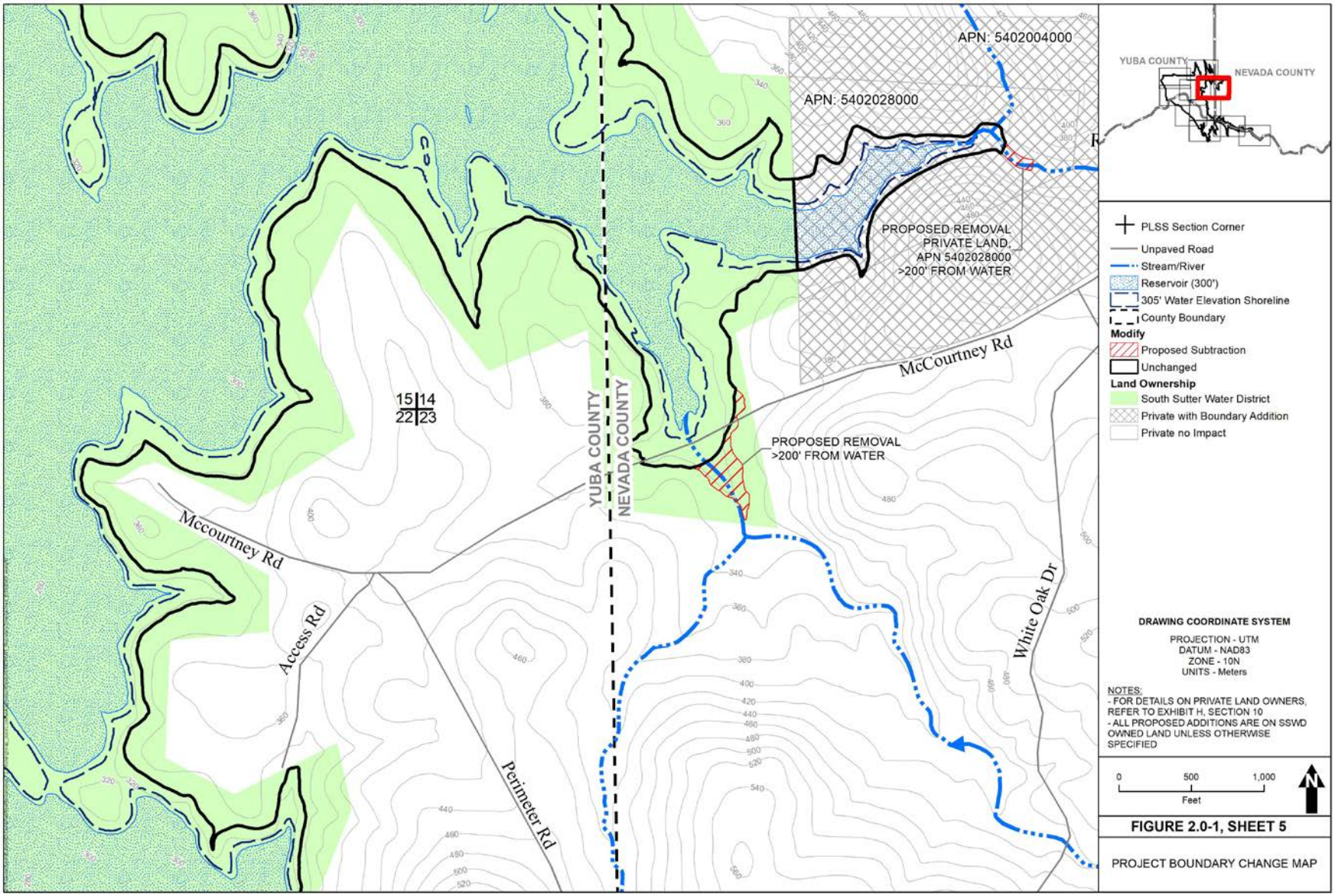


Figure 2.0-1. Sheet 5. Project Boundary Change Map.

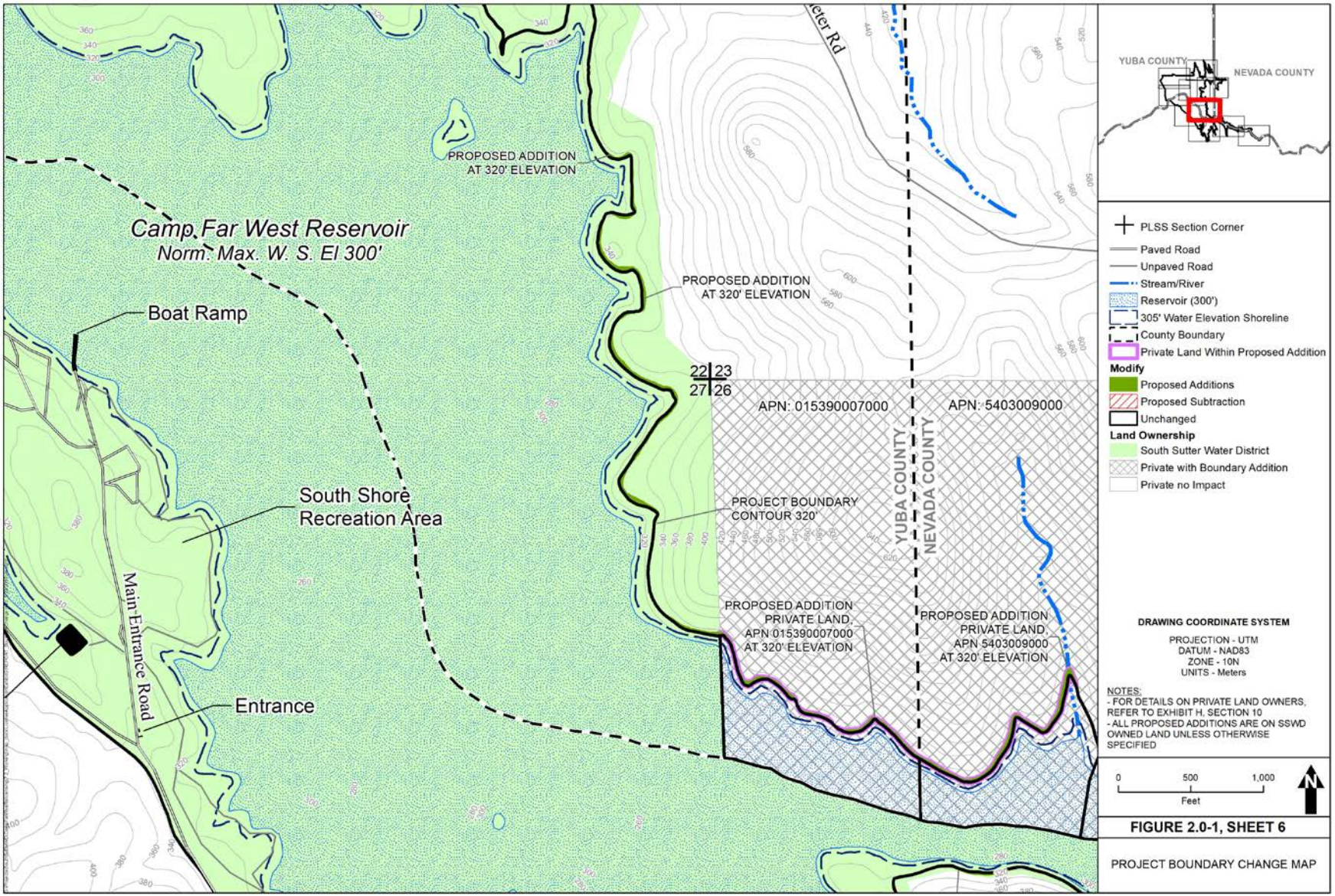


Figure 2.0-1. Sheet 6. Project Boundary Change Map.

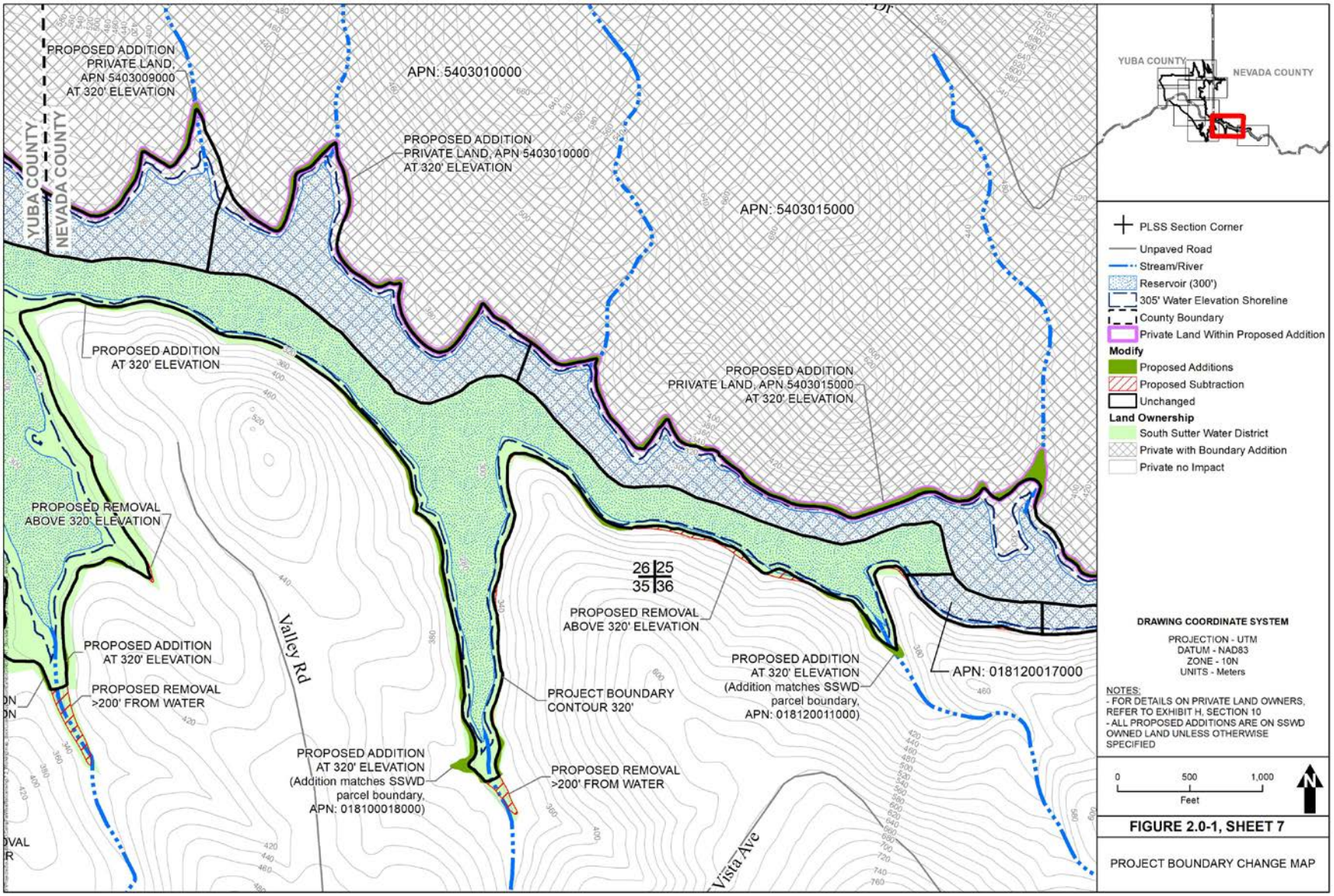


Figure 2.0-1. Sheet 7. Project Boundary Change Map.

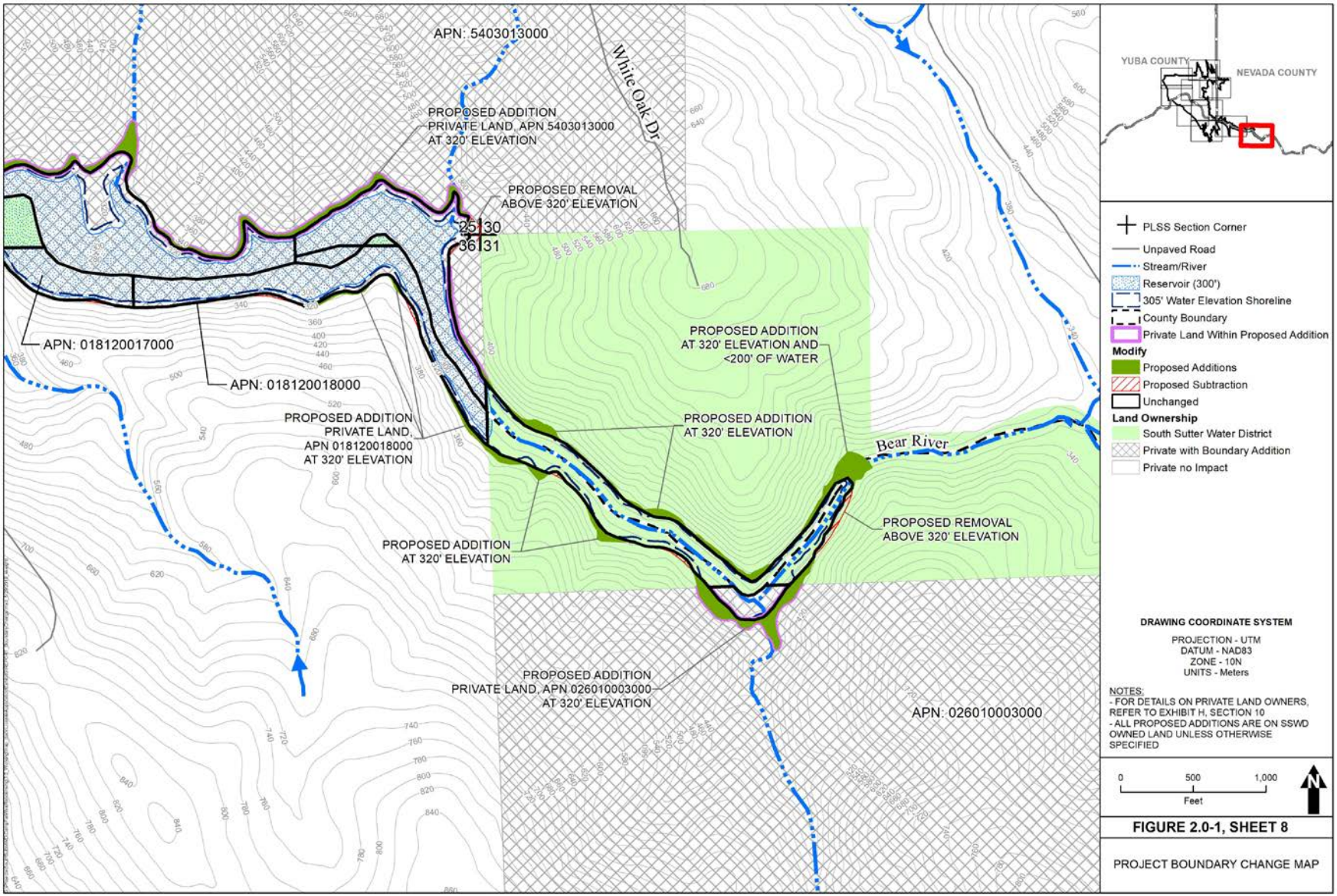


Figure 2.0-1. Sheet 8. Project Boundary Change Map.

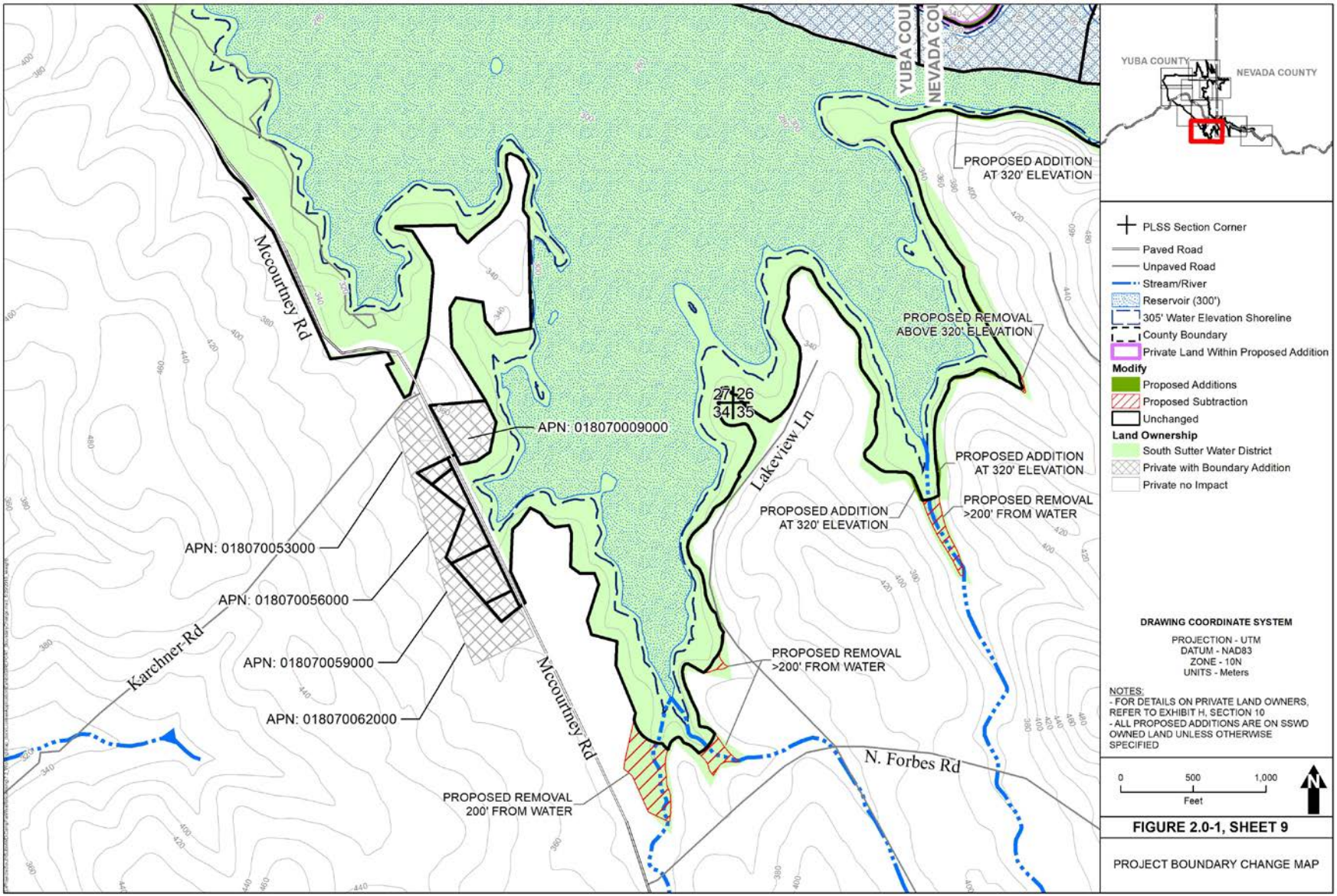


Figure 2.0-1. Sheet 9. Project Boundary Change Map.

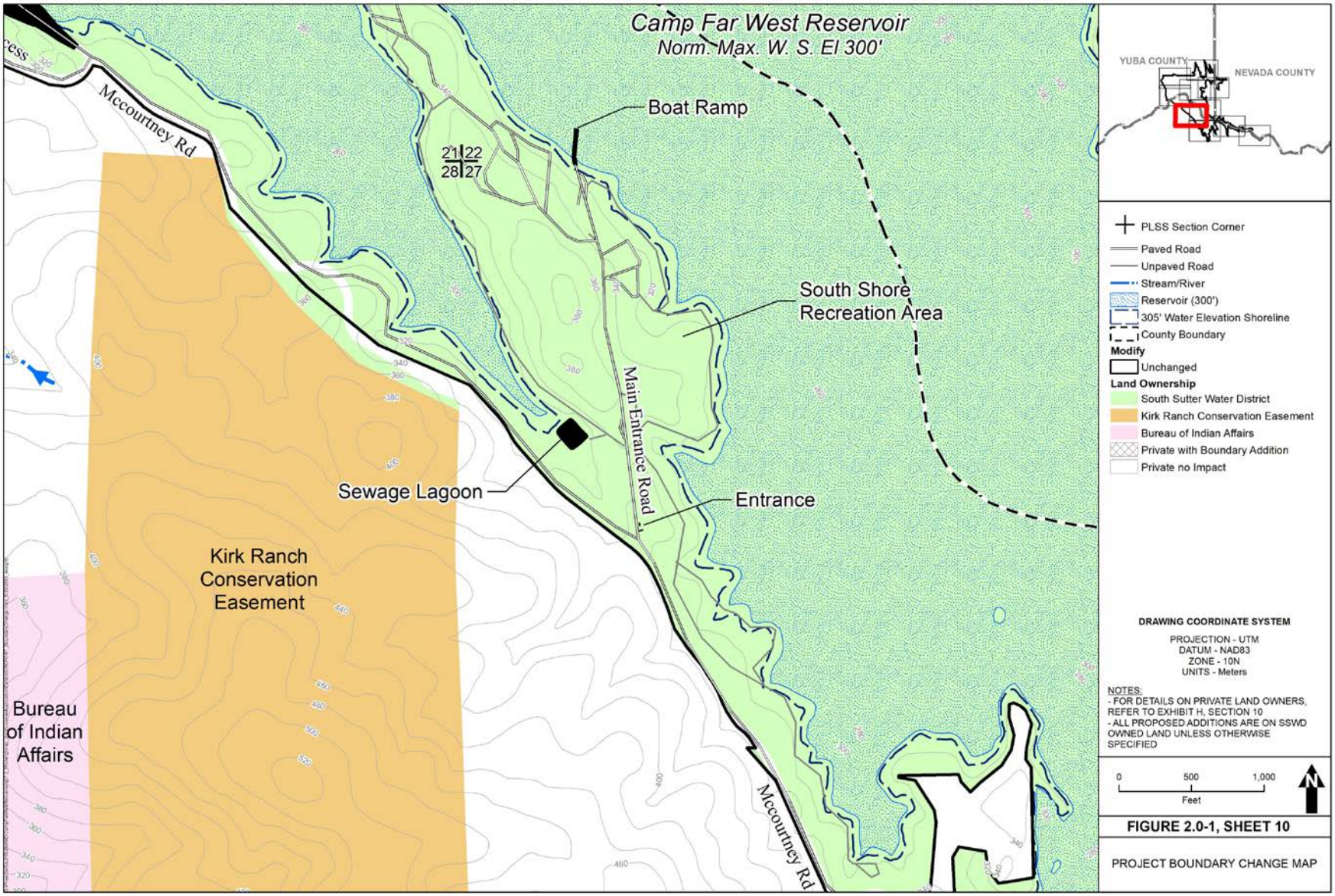


Figure 2.0-1. Sheet 10. Project Boundary Change Map.

Topographic contours representing elevations above NMWSE are derived from the United States Geologic Survey (USGS) National Elevation Dataset (NED) 1/3 arc second Digital Elevation Model (DEM), accessed from the USGS web server in August 2017.

Using the current elevation standard, NAVD88, contours were generated. The contour 20 ft above the Project reservoir defines the proposed FERC Project Boundary. This boundary best meets the operational needs of SSWD, within guidelines established by FERC regarding use of the contour data. In areas that are fewer than 20 ft above the NMWSE, the boundary is placed at 200 ft from the reservoir shore.

Land ownership in the areas proposed for removal and addition to the FERC boundary vary, and consist of SSWD and private lands. A summary of proposed changes by land ownership is provided in Table 2.0-2.

Table 2.0-2. Summary of lands impacted by SSWD's proposed change to the existing FERC Project Boundary.

Owner and Action	Added to Include Primary Project Roads (ac)	Beyond 200 ft from NMWSE (ac)	Correction to 320 ft contour (ac)	Not Used for Project O&M (ac)	Added to include recreation area (ac)	Total (ac)
EXISTING FERC PROJECT BOUNDARY						
Private Lands	--	--	--	--	--	139.6
SSWD Lands	--	--	--	--	--	2,724.1
Total	--	--	--	--	--	**2,863.7**
PROPOSED CHANGES TO EXISTING FERC PROJECT BOUNDARY						
Changes to Private Lands						
addition	+0.7	--	+7.2	--	--	+7.9
subtraction	--	-0.4	-0.4	--	--	-0.8
Subtotal	*+0.7*	*-0.4*	*+6.8*	*0.0*	--	*+7.1*
addition	0	--	+7.7	--	+6.7	+14.4
subtraction	--	-87.6	-2.0	-121.6	--	-211.2
Subtotal	*0*	*-87.6*	*+5.7*	*-121.6*	*+6.7*	*-196.8*
Total	**+0.7**	**-88.0**	**+12.5**	**-121.6**	**+6.7**	**-189.7**
PROPOSED FERC PROJECT BOUNDARY						
Private Lands	--	--	--	--	--	146.7
SSWD Lands	--	--	--	--	--	2,527.3
Total	--	--	--	--	--	**2,674.0**

SSWD either owns in fee simple or possesses adequate land rights over all lands shown that are inside the existing FERC Project Boundary and will acquire the rights to all lands not currently in the existing Project Boundary. Assessor parcel numbers (APNs) for private lands in areas that are proposed to be added to the Project Boundary are shown as grey cross hatching in Figure 2.0-1.

All private landowners impacted by SSWD's proposed additions to the FERC Project Boundary are listed with the associated APNs in Section 10.0 of Exhibit H of this Application for New License, and the land owners have been notified of the proposed additions to the FERC Project Boundary, as described in Section 10 of Exhibit H.

3.0 Project Maps

General maps for SSWD's proposed FERC Project Boundary as described in Exhibit A of this Application for New License are provided in the single exhibit drawing listed in Table 3.0-1. This map depicts the proposed FERC Project Boundary in conformance with 18 C.F.R. Sections 4.39 and 4.41(h) that encompasses only those lands needed and necessary for Project operation and maintenance.

Table 3.0-1. Lists of Exhibit G Project maps for the Camp Far West Project.

Exhibit G Map Number in Existing License	Date of FERC Order Approving Exhibit G Map	FERC-Assigned Drawing Number	SSWD's Proposed Exhibit G Drawing Number in New License	Map Name
G-1	2/23/2004	-16	G-1	Project Boundary Map

4.0 List of Attachments

Attachment G-1 Proposed FERC Project Boundary Map

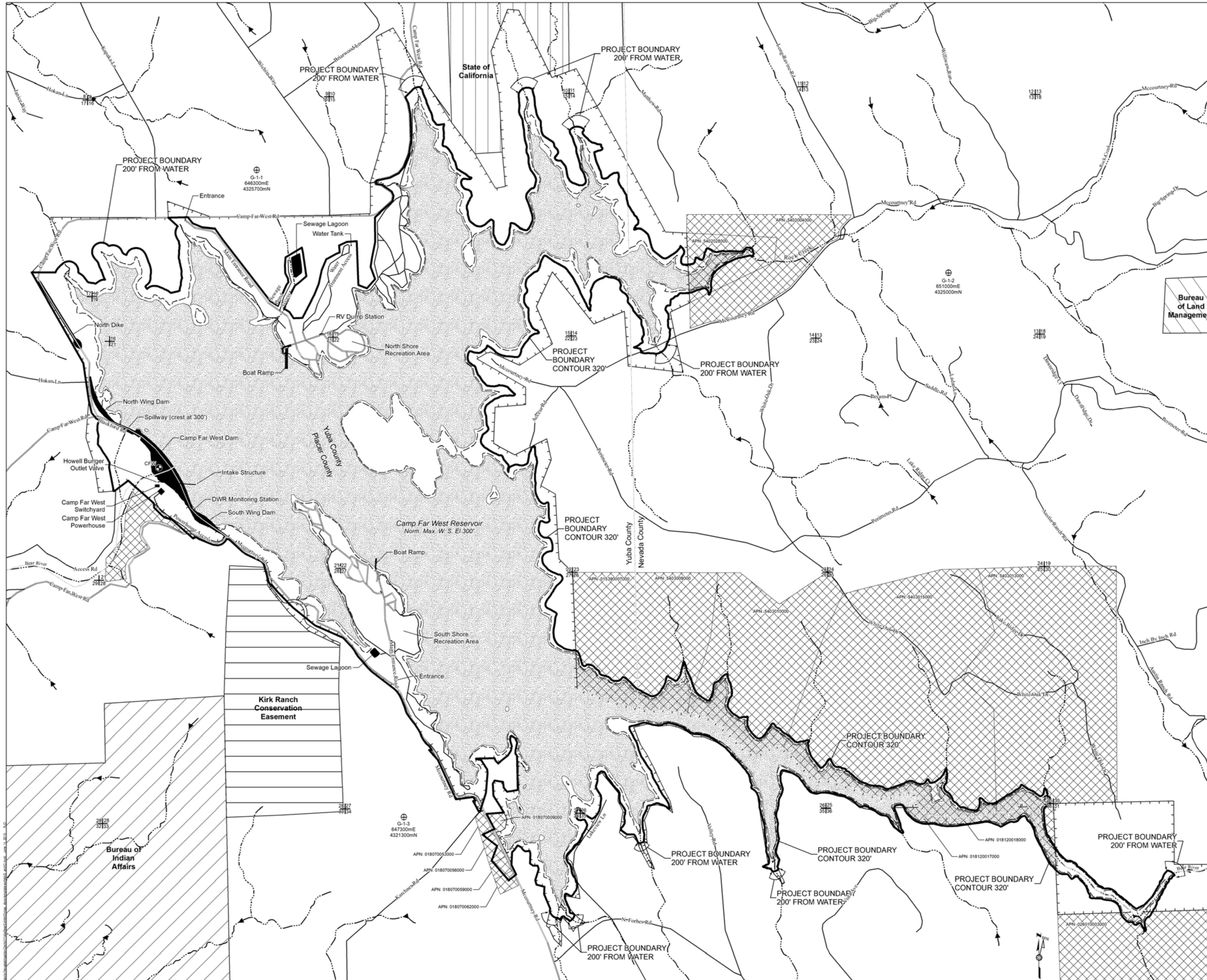
Attachment G-2 GIS Shapefiles of Proposed Project Boundary, Private Lands within Proposed Project Boundary, and Exhibit G Map Reference Points

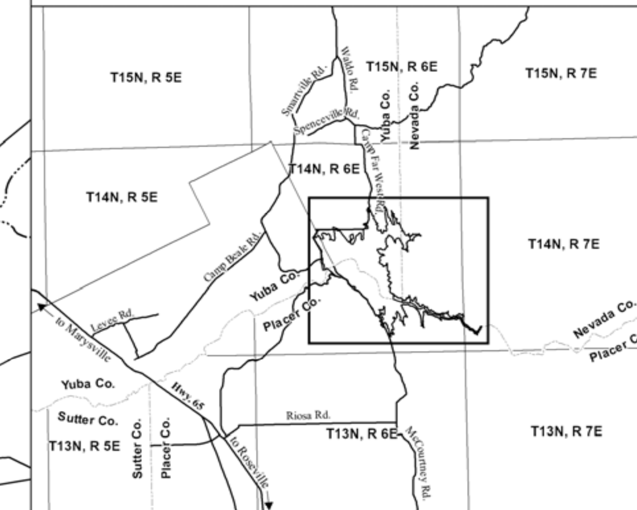
5.0 Reference Cited

Federal Energy Regulatory Commission (FERC). 2014. Managing Hydropower Project Exhibits: Guidance Document. Office of Energy Projects, Division of Hydropower Administration and Compliance. August 2014.

Attachment G-1

Proposed FERC Project Boundary Map (PDF)





SURVEYORS STATEMENT

I HEREBY CERTIFY TO THE FEDERAL ENERGY REGULATORY COMMISSION (FERC) THAT THIS PLAN MEETS THE CONDITIONS SET FORTH BY FERC FOR ITS EXPRESSED PURPOSE. THE PURPOSE OF THIS MAP IS TO PROVIDE A GEOREFERENCED VISUAL DEPICTION OF THE LOCATION OF PROJECT FEATURES AND BOUNDARIES BASED ON THE BEST AVAILABLE HISTORICAL DRAWINGS AND DIGITAL REFERENCE SOURCES INCORPORATED INTO THE GEOGRAPHIC INFORMATION SYSTEM (GIS). LOCATIONS HAVE NOT BEEN VERIFIED BY PHYSICAL FIELD SURVEYS AND THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OF DEVELOPING PROPERTY BOUNDARY DESCRIPTIONS.

STATE OF MAINE — LAND SURVEYOR

DRAWING COORDINATE SYSTEM

PROJECTION - UTM
DATUM - NAD83
ZONE - 10N
UNITS - METER

BASE MAP DATA SOURCES

ROADS: ESRI 9.3 (TELE ATLAS),
HYDROGRAPHY: DIGITIZED FROM USDA
NAIP AERIAL IMAGERY

LEGEND

- Reference Point
- PLSS Section Corner
- Gage
- Stream/River
- Paved Road
- Unpaved Road
- County Boundary
- Reservoir (300')
- 305' Water Elevation Shoreline
- Proposed FERC Boundary

Ownership

- Kirk Ranch Conservation Easement
- Bureau of Indian Affairs
- Bureau of Land Management
- State of California
- South Sutter Water District
- Private

0 500 1,000 2,000 3,000 Feet
0 150 300 600 900 Meters

EXHIBIT G-1

CAMP FAR WEST HYDROELECTRIC PROJECT BOUNDARY MAP

CFW HYDROELECTRIC PROJECT (FERC NO. 2997)
SOUTH SUTTER WATER DISTRICT, TROWBRIDGE, CALIFORNIA

DATE:	SCALE:	DRAWING NUMBER:
9/4/18	1 inch = 1,000 feet	P-2997-

Attachment G-2

GIS Shapefiles of Proposed Project Boundary, Federal Lands within Proposed Project Boundary, and Exhibit G Map Reference Points (CD)

Attachment G-2 of Exhibit G – Project Maps consists of one CD containing GIS shapefiles of the proposed Project Boundary, Federal Lands within the proposed Project Boundary, and Exhibit G Map Reference Points. Due to the file type, the files on the CD cannot be uploaded to FERC's e-Library system. SSWD will file a copy of the CD with FERC.

A copy of the CD can be obtained by contacting:

Brad Arnold
General Manager
South Sutter Water District
Office 530-656-2242
sswd@hughes.net
www.southsutterwd.com/

Application for New License
Major Project – Existing Dam

Exhibit H
Miscellaneous Filing Material

Security Level: Public

Camp Far West Hydroelectric Project
FERC Project No. 2997

Prepared by:
South Sutter Water District
2464 Pacific Avenue
Trowbridge, CA 95659
www.sswd@hughes.net

June 2019

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List of Attachments

None.

EXHIBIT H

MISCELLANEOUS FILING MATERIAL

1.0 Introduction

The South Sutter Water District (SSWD or Licensee) has prepared this Exhibit H, Miscellaneous Filing Material, as part of its Application for a New License Major Project – Existing Dam – (FLA) from the Federal Energy Regulatory Commission (FERC or Commission) for the Camp Far West Hydroelectric Project, FERC Project Number (No.) 2997 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (traditional process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section 4.51(i), which describes the contents of Exhibit H, Miscellaneous Filing Material. As a reference, 18 C.F.R. Section 4.51(i) states:

(c) *Exhibit H*. The information required to be provided by this paragraph (c) must be included in the application as a separate exhibit labeled "Exhibit H."

(1) *Information to be supplied by an applicant for a new license: Filing requirements.*

(i) Information to be supplied by all applicants. All applicants for a new license under this part must file the following information with the Commission:

(A) A discussion of the plans and ability of the applicant to operate and maintain the Project in a manner most likely to provide efficient and reliable electric service, including efforts and plans to:

(1) Increase capacity or generation at the Project:

(2) Coordinate the operation of the Project with any upstream or downstream water resource projects; and

(3) Coordinate the operation of the Project with the applicant's or other electrical systems to minimize the cost of production.

(B) A discussion of the need of the applicant over the short and long term for the electricity generated by the Project, including:

(1) The reasonable costs and reasonable availability of alternative sources of power that would be needed by the applicant or its customers, including wholesale customers, if the applicant is not granted a license for the Project;

(2) A discussion of the increase in fuel, capital, and any other costs that would be incurred by the applicant or its customers to purchase or generate power necessary to replace the output of the licensed Project, if the applicant is not granted a license for the Project;

(3) The effect of each alternative source of power on:

(i) The applicant's customers, including wholesale customers;

(ii) The applicant's operating and load characteristics; and

(iii) The communities served or to be served, including any reallocation of costs associated with the transfer of a license from the existing licensee.

(C) The following data showing need and the reasonable cost and availability of alternative sources of power:

(1) The average annual cost of the power produced by the Project, including the basis for that calculation;

(2) The projected resources required by the applicant to meet the applicant's capacity and energy requirements over the short and long term including:

(i) Energy and capacity resources, including the contributions from the applicant's generation, purchases, and load modification measures (such as conservation, if considered as a re-source), as separate components of the total resources required;

(ii) A resource analysis, including a statement of system reserve margins to be maintained for energy and capacity; and

(iii) If load management measures are not viewed as resources, the effects of such measures on the projected capacity and energy requirements indicated separately;

(iv) For alternative sources of power, including generation of additional power at existing facilities, restarting deactivated units, the purchase of power off-system, the construction or purchase and operation of a new power plant, and load management measures such as conservation: The total annual cost of each alternative source of power to replace Project power; the basis for the determination of projected annual cost; and a discussion of the relative merits of each alternative, including the issues of the period of availability and dependability of purchased power, average life of alternatives, relative equivalent availability of generating alternatives, and relative impacts on the applicant's power system reliability and other system operating characteristics; and the effect on the direct providers (and their immediate customers) of alternate sources of power.

(D) If an applicant uses power for its own industrial facility and related operations, the effect of obtaining or losing electricity from the Project on the operation and efficiency of such facility or related operations, its workers, and the related community.

(E) If an applicant is an Indian tribe applying for a license for a Project located on the tribal reservation, a statement of the need of such Indian tribe for electricity generated by the Project to foster the purposes of the reservation.

(F) A comparison of the impact on the operations and planning of the applicant's transmission system of receiving or not receiving the Project license, including:

(1) An analysis of the effects of any resulting redistribution of power flows on line loading (with respect to applicable thermal, voltage, or stability limits), line losses, and necessary new construction of transmission facilities or upgrading of existing facilities, together with the cost impact of these effects;

(2) An analysis of the advantages that the applicant's transmission system would provide in the distribution power; and

(3) Detailed single-line diagrams, including existing system facilities identified by name and circuit number, that show system transmission elements in relation to the Project and other principal interconnected system elements. Power flow and loss data that represent system operating conditions may be appended if applicants believe such data would be useful to show that the operating impacts described would be beneficial.

(G) If the applicant has plans to modify existing Project facilities or operations, a statement of the need for, or usefulness of, the modifications, including at least a reconnaissance-level study of the effect and projected costs of the proposed plans and any alternate plans, which in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in section 10(a)(1) of the Federal Power Act.

(H) If the applicant has no plans to modify existing Project facilities or operations, at least a reconnaissance-level study to show that the Project facilities or operations in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in section 10(a)(1) of the Federal Power Act.

(I) A statement describing the applicant's financial and personnel resources to meet its obligations under a new license, including specific information to demonstrate that the applicant's personnel are adequate in number and training to operate and maintain the Project in accordance with the provisions of the license.

(J) If an applicant proposes to expand the Project to encompass additional lands, a statement that the applicant has notified, by certified mail, property owners on the additional lands to be encompassed by the Project and governmental agencies and subdivisions likely to be interested in or affected by the proposed expansion.

(K) The applicant's electricity consumption efficiency improvement program, as defined under section 10(a)(2)(C) of the Federal Power Act, including:

(1) A statement of the applicant's record of encouraging or assisting its customers to conserve electricity and a description of its plans and capabilities for promoting electricity conservation by its customers; and

(2) A statement describing the compliance of the applicant's energy conservation programs with any applicable regulatory requirements.

(L) The names and mailing addresses of every Indian tribe with land on which any part of the proposed Project would be located or which the applicant reasonably believes would otherwise be affected by the proposed Project.

(ii) Information to be provided by an applicant licensee. An existing licensee that applies for a new license must provide:

(A) The information specified in paragraph (c)(1).

(B) A statement of measures taken or planned by the licensee to ensure safe management, operation, and maintenance of the Project, including:

(1) A description of existing and planned operation of the Project during flood conditions;

(2) A discussion of any warning devices used to ensure downstream public safety;

(3) A discussion of any proposed changes to the operation of the Project or downstream development that might affect the existing Emergency Action Plan, as described in Subpart C of Part 12 of this chapter, on file with the Commission;

(4) A description of existing and planned monitoring devices to detect structural movement or stress, seepage, uplift, equipment failure, or water conduit failure, including a description of the maintenance and monitoring programs used or planned in conjunction with the devices; and

(5) A discussion of the project's employee safety and public safety record, including the number of lost-time accidents involving employees and the record of injury or death to the public within the Project boundary.

(C) A description of the current operation of the Project, including any constraints that might affect the manner in which the Project is operated.

(D) A discussion of the history of the Project and record of programs to upgrade the operation and maintenance of the Project.

(E) A summary of any generation lost at the Project over the last five years because of unscheduled outages, including the cause, duration, and corrective action taken.

(F) A discussion of the licensee's record of compliance with the terms and conditions of the existing license, including a list of all incidents of noncompliance, their disposition, and any documentation relating to each incident.

(G) A discussion of any actions taken by the existing licensee related to the Project which affect the public.

(H) A summary of the ownership and operating expenses that would be reduced if the Project license were transferred from the existing licensee.

(I) A statement of annual fees paid under Part I of the Federal Power Act for the use of any Federal or Indian lands included in the Project boundary.

Besides this introductory material, this exhibit includes 20 sections. Section 2.0 provides SSWD's plans to maintain and operate the Project in an efficient and reliable fashion. Section 3.0 describes SSWD's need for the power generated by the Project. Section 4.0 describes alternatives to generate the power and cost for such alternatives. Sections 5.0, 6.0 and 7.0 relate to industrial facilities, the need for Project power by Native American tribes and effects of the Project on the transmission system, respectively. Section 8.0 addresses the comprehensive development of the waterway. SSWD's financial and personnel resources to operate the Project are described in Section 9.0. Section 10.0 documents SSWD's notification to land owners potentially-affected by SSWD's plan to expand the existing FERC Project Boundary. Section 11.0 describes SSWD's existing and proposed electricity consumption efficiency programs. The names and mailing addresses of potentially-affected Native American tribes are included in Section 12.0. Section 13.0 describes SSWD's plans to manage, operate and maintain the Project in a safe manner. Section 14.0 describes SSWD's current operation of the Project including any constraints. Section 15.0 presents the Project's history. Section 16.0 lists lost Project power instances over the past 5 years due to unscheduled outages. SSWD's compliance record is described in Section 17.0. Section 18.0 describes operations of the Project that may affect the public. Section 19.0 describes the effects of transferring the license to a third party on SSWD's ownership and expenses. Section 20.0 presents the annual fees paid by SSWD for use of federal and Indian lands. Section 21.0 includes a list of references cited in this Exhibit H.

See Exhibit A for a description of Project facilities and features, Exhibit B for a description of proposed Project operations and resource utilization, Exhibit C for a construction history and a proposed construction schedule, Exhibit D for costs and financing information, and Exhibit E for a discussion of potential environmental effects and SSWD's proposed resource management measures. Project general design drawings and maps are included in Exhibits F and G, respectively.

All elevation data in this exhibit is in United States Department of Commerce (USDOC), National Oceanic and Atmospheric Association (NOAA), National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

2.0 Efficient and Reliable Electric Service

SSWD has consistently demonstrated its capability to manage, operate and maintain the Project in a manner that delivers efficient and reliable electricity. The Project has consistently been operated to generate power in compliance with applicable reservoir operation restrictions for environmental and recreational purposes and consumptive water supply.

2.1 Increase in Capacity or Generation

SSWD's Proposed Project includes raising the normal maximum water surface elevation (NMWSE) of Camp Far West Reservoir by 5 feet (ft) from an elevation of 300 ft to an elevation

of 305 ft, which would increase Camp Far West Reservoir storage by 9,857 acre-feet (ac-ft) to a capacity of 102,868 ac-ft at Camp Far West Reservoir's new NMWSE of 305 ft.[1] The Pool Raise would involve demolition of the concrete cap on the existing Camp Far West Dam spillway, the addition of approximately 1,730 cy of concrete to raise the existing spillway crest from an elevation of 300 ft to an elevation 305 ft, and anchoring of the new concrete with steel dowels. SSWD estimates the Pool Raise would increase average annual power generation by 905 megawatt-hours (MWhrs), a 4.4 percent increase in average annual generation, with most of this increase occurring during April through August as reservoir storage would be higher leading to greater head on the powerhouse and, thus, increased power production.

2.2 Project Coordination with Other Water Resources Projects

SSWD actively coordinates Project operations with seven water projects: four upstream of the Project and three downstream of the Project.

2.2.1 Coordination with Upstream Water Projects

The upstream water projects are Pacific Gas and Electric Company's (PG&E) 190-megawatt (MW) Drum-Spaulding Project, FERC Project No. 2310; Nevada Irrigation District's (NID) 79.3-MW Yuba-Bear Hydroelectric Project, FERC Project No. 2266; NID's 1.5-MW Lake Combie Project, FERC Project No. 2981; and NID's 0.35-MW Combie North Aqueduct Project, FERC Project No. 7731.

The Drum-Spaulding Project is located on the South Yuba River, Bear River, North Fork of the North Fork American River and tributaries to the Sacramento River Basin in Nevada and Placer counties, California. Major project reservoirs include Lake Spaulding (74,773 ac-ft) on the South Yuba River and Fordyce Lake (49,903 ac-ft) on Fordyce Creek. In addition, the Drum-Spaulding Project includes numerous smaller reservoirs on tributaries to the South Yuba River, and diversions from the South Yuba River to Deer Creek via the South Yuba and Chalk Bluff Canals (maximum capacity of 107 cubic feet per second, or cfs) and to the Bear River via the Drum Canal (840 cfs).

The Yuba-Bear Hydroelectric Project includes a storage reservoir on the Middle Yuba River (Jackson Meadows Reservoir) with a gross storage capacity of 69,205 ac-ft, and five storage reservoirs on Canyon Creek (Jackson, French, Faucherie, Sawmill and Bowman reservoirs) with a combined gross storage capacity of 90,790 ac-ft. The project also includes a diversion with a maximum capacity of about 450 cfs via the Milton-Bowman Diversion Dam from the Middle Yuba River to Bowman Lake on Canyon Creek, and a diversion with a maximum capacity of about 300 cfs via the Bowman-Spaulding Canal from Bowman Lake on Canyon Creek to PG&E's Fuller Lake on the South Yuba River.

[1] For the purpose of this exhibit, this is referred to as the "Pool Raise."

The Lake Combie Project along with the Combie North Aqueduct Project form Lake Combie on the Bear River. The dam was originally constructed in 1928. Lake Combie has a gross storage capacity of 5,555 ac-ft. The North Aqueduct Project diverts up to 200 cfs of Bear River water into NID's Combie Phase I Canal.

The upstream projects import water into the Bear River watershed from the Yuba River, and export water from both the Yuba and Bear River watersheds into the American and Sacramento River watersheds. The operations of the upstream projects have a significant effect on the timing and magnitude of inflow into Camp Far West Reservoir. Informal communication occurs in the spring and throughout the irrigation season between SSWD and the upstream project operators regarding the expected rate and timing of inflow into Camp Far West. There is no formal process for coordination, nor established method to forecast upstream operations and inflow to Camp Far West Reservoir. Camp Far West is operated independently from the upstream projects and vice versa.

2.2.2 Coordination with Downstream Water Projects

The downstream water projects are SSWD's water supply project; the Camp Far West Irrigation District's (CFWID) water supply project; and the Bay-Delta.

Up to 475 cfs of the water released from Camp Far West Reservoir is re-diverted from the Bear River during the irrigation season (i.e., typically, from mid-April through mid- October) at a 38-ft-high, non-Project diversion dam located approximately 1.25 mi downstream from Camp Far West Dam into SSWD's Conveyance Canal, which is located on the south bank and runs predominately north to south along the higher eastern border of SSWD's service area. Typically, water deliveries begin low in mid-April, peak in July, and then gradually decrease through mid-October. Through turnouts and head gates, water is directed from SSWD's Conveyance Canal into improved canals, one pipeline, and natural channels running from east to west, and distributed to water users. Depending upon the anticipated reservoir yield, the water user's allocations may range from 0.5 ac-ft per ac of irrigated land during a drought year to as much as 2.5 ac-ft per ac during a wet year. Perennial crops such as orchards and pasture receive a higher priority of allocation over seasonal crops, with rice growers receiving the lowest priority.

Approximately 40 cfs of that water that is diverted into SSWD's Conveyance Canal is re-diverted from the first 0.5-mi of the canal to CFWID. In addition, CFWID diverts up to 35 cfs of Bear River water at the non-Project diversion dam into CFWID Camp Far West Canal on the north bank.

SSWD releases up to 4,400 ac-ft of water from Camp Far West Reservoir in dry and critical years to implement the objectives in the *Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary* adopted May 22, 1995 (SWRCB 1995).

2.3 Project Coordination with Other Electrical Systems to Minimize Cost of Production

SSWD does not currently own or operate an independent electrical transmission system.

SSWD's Camp Far West Powerhouse is connected to the Power Grid at the Camp Far West Switchyard via PG&E's Camp Far West Transmission Line Project (FERC Project No. 10821).

3.0 SSWD's Need for the Project

3.1 Power to Northern California

SSWD entered into a Contract for the Sale and Purchase of Electricity with the Sacramento Municipal Utility District (SMUD) in August 1981. At this time, SSWD plans to continue to sell all Project power to SMUD through June 2031, when the SMUD Contract expires. SMUD uses the power to meet its electricity needs within its service territory.

Upon termination of the SMUD Contract, SSWD plans to negotiate a new lease/power purchase contract or multiple contracts with an unknown (at this time) third-party. The new buyer may sell the Project power into the market or use the power for its own needs. If the third-party is SMUD, the electricity output of the Project will continue to be used to meet the electricity needs in SMUD's service territory. Power generated from the Project will be scheduled through the California Independent System Operator (CAISO) wholesale energy markets.

The CAISO operates most of California's power grid, comprising some 124,000 square mi, or three-quarters of the State of California. In addition to operating the Power Grid, the CAISO operates wholesale energy markets comprised of distinct day-ahead and real-time processes that include both energy and ancillary services. The energy products and services traded in the CAISO markets allow the CAISO to meet reliability needs and serve load. The CAISO day-ahead and real-time market processes clear based on the generator bids and system load. A major component of the market is the full network model, which analyzes the active transmission and generation resources to find the least cost energy to serve demand. The model produces prices that show the cost of producing and delivering energy from individual nodes, or locations on the grid where transmission lines and generation interconnect.

3.2 Cost and Availability of Alternative Sources of Power

Exhibit D includes a detailed discussion of the cost and availability of alternative sources of power.

3.3 Effects of Alternative Source of Power

It is unlikely that SSWD would develop a new power Project to replace the Project power, though the power would need to be replaced by a third party to continue to meet California's power needs.

3.4 Effects on SSWD to Purchase or Generate Replacement Power

If SSWD is not granted a new license for the Project, SSWD would continue to operate the Project facilities, excluding the power generating facilities, outside of FERC jurisdiction as water supply facilities (i.e., no electricity generation facilities). SSWD would not enjoy the revenue from power sales, so SSWD's water customers would be affected. Furthermore, SSWD's debt that is being used to fund the relicensing effort is secured with hydro revenue. If revenue is not being obtained from the Project, this would put a large financial burden onto SSWD's water customers.

If a new license is not issued, it is unlikely that SSWD would develop a new power Project to replace the Project power, so SSWD would not incur any increase in fuel, capital or other related costs.

SSWD anticipates, though, that a third party would likely develop a power source to replace the power lost to California. That party would incur new costs related to development and operations of a new source of power and fuel costs related to operations of the new source. Since that third party would pass these costs onto retail customers and given that the Project power is relatively inexpensive, it is possible that electricity costs for the communities served would increase.

4.0 Cost of Production and Alternative Sources of Power

4.1 Average Annual Cost of Project Power

Exhibit D includes a detailed estimate, including the basis for the calculations, of SSWD's cost of electricity production under both the No Action Alternative and SSWD's Proposed Project Alternative.

4.2 Projected Resources to Meet SSWD's Capacity and Energy Requirements

As stated above, SSWD does not support an electricity service territory and, consequently, does not have any electricity capacity or energy requirements. Therefore, this item is not applicable.

5.0 Effect on Industrial Facility

SSWD does not use the Project power for its own industrial facility. Therefore, this item is not applicable.

6.0 Indian Tribe Need for Electricity

SSWD is not a Native American tribe. Therefore, this item is not applicable.

7.0 Effect on Transmission System

SSWD does not own or operate an electric transmission system. Therefore, this item is not applicable, except with regards to a single-line diagram. A single-line electric diagram is included in Volume VI of SSWD's Application for New License. This information is considered Critical Energy Infrastructure Information (CEII), and is not made available to the public.

8.0 Comprehensive Development of the Waterway

At the outset of the current relicensing process, SSWD considered potential Project modifications that would enhance the Project's contribution to the comprehensive improvement and development of the waterway and for other beneficial public uses that were within SSWD's means to implement. The study did not identify any necessary modification to Project facilities that, in conjunction with other developments in the area, are needed to conform with comprehensive plans for improving or developing the waterway and other beneficial public uses as described in Section 10(a)(1) of the FPA, other than the Pool Raise, which SSWD includes in its Proposed Project. Refer to Section 7.0 of Exhibit E for a detailed discussion regarding Project consistency with comprehensive plans.

9.0 Financial and Personnel Resources

9.1 Financial Resources

SSWD's sources of financing and revenue are sufficient to meet the continuing O&M needs of the Project. Historically, SSWD's O&M, capital and debt service costs related to power production were paid by SMUD in exchange for the power produced by the Project. As described above, the SSWD/SMUD contract continues through June 2031 unless otherwise terminated by SMUD and SSWD, after which SSWD plans to negotiate a new lease/power purchase contract or multiple contracts with, at this time, an unknown third-party, which could be SMUD. The revenues from these sources will be used to support the Project.

9.2 Personnel Resources

SSWD has extensive experience operating and maintaining the Project in a safe, efficient and reliable manner. SSWD has been operating and maintaining the Project for over 35 years. SSWD, through SMUD, has had responsibility for generating wholesale electricity that historically has been delivered to SMUD. SSWD is confident that its hydro resources will continue to be critical to providing efficient and reliable electric service to consumers in California.

SSWD currently has staff of about nine full-time employees, with all of those staff dedicated to the safe and efficient operation of the Project. The staff are headquartered near the Project at SSWD's Trowbridge, California, office.

10.0 Project Boundary Expansion Notification

As described in Exhibit G, SSWD proposes to modify the existing FERC Project Boundary. This modification would entail reducing the boundary in certain locations and expanding it in other locations. While most of the boundary changes would affect SSWD-owned lands, some private property owners would be affected. SSWD has notified, by certified mail, property owners on the additional lands to be encompassed by the Project. No governmental agencies, tribal lands, or subdivisions would be interested in or affected by the boundary expansion. The private property owners that would be affected are listed in Table 10.0-1. All are in Yuba County, CA.

Table 10.0-1. List of property owners who would have 0.5 acres or more of land impacted by SSWD's proposed expansion of the FERC Project boundary.

Assessor's Parcel Number	Acres Added to Project Boundary	Owner's Name
5403009000	0.7	SPLINTER MICHAEL TRSTE
5403010000	1.1	SPLINTER MICHAEL TRSTE
5403015000	2.6	SPLINTER MICHAEL TRSTE
5403013000	0.9	JENSON PETE & STACY
018020015000	0.7	LASSAGA ALBERT J ET AL
026010003000	1.4	PINEBROOK VILLAGE L P

11.0 Electricity Consumption Efficiency Improvement Program

SSWD does not currently serve a retail load from the Project. Therefore, this item is not applicable. However, SSWD does encourage energy efficiency improvements especially in regards to agricultural users within its Service Territory. For example, the District recommends use of variable speed pumps.

12.0 Indian Tribes Names and Mailing Addresses

The names and mailing addresses of local Native American tribes who would likely be interested in this Project relicensing are included in the Initial Statement of SSWD's Application for New License.

13.0 Safe Management, Operation and Maintenance of the Project

All facilities are maintained to ensure safe and reliable operation. Each Project facility is visited at least several times weekly by SSWD's personnel who are experienced and familiar with the Project. Potential problems are identified and corrected, or scheduled for repair as they are discovered, in order of the severity of the potential problems. Project operations personnel are on duty as needed.

In addition, remote operation and monitoring of the Camp Far West Powerhouse is automatically controlled by SMUD's Supervisory Control and Data Acquisition (SCADA) system that is staffed 24 hours a day 7 days a week. Reservoir levels and power facilities are continuously monitored and any parameters out of the normal operating range are brought to SSWD's attention. SSWD evaluates and determines further action including call-out of operations and maintenance personnel.

If a hazardous situation develops at Camp Far West Dam, SSWD follow the current Emergency Action Plan (EAP) guidelines and notification flowcharts to provide early warning of an emergency condition to emergency management agencies. The EAP guidelines include requirements for dam monitoring in the event of an emergency.

SSWD has implemented other public safety measures at Project facilities. Potentially hazardous areas (e.g., Camp Far West Powerhouse) are secured, to the extent practicable, against public entry. Warning devices (e.g., signs, fences and barriers) have been installed to warn the public. Both FERC and the California DWR, Division of Safety of Dams (DSOD) inspects Camp Far West Dam annually.

13.1 Operation during Flood Conditions

The Camp Far West Dam does not include any requirements for flood control.

13.2 Warning Devices for Public Safety

Public safety warning signs are provided at locations where changes in Project operations have the potential to quickly alter water levels. Exclusion buoy lines are in place at Camp Far West Reservoir to prevent boating access near the intake and spillway.

13.3 Emergency Action Plan

SSWD completed a comprehensive revision of its Project EAP in 2017. SSWD conducts Tabletop and Functional exercises on a 5-year cycle. The last Tabletop and Functional exercises were in 2017. The EAP is reviewed annually to ensure that all information is up to date.

13.4 Monitoring Devices

The civil structures are outfitted with a variety of monitoring devices to detect settlement or displacement movement and leakage in dams, and to protect from conduit failure. Devices installed and maintained include: leakage weirs, survey pedestals, level sensors, and loss of pressure alarms.

SSWD monitors civil structures by conducting regular, periodic visual observations and by reviewing and analyzing data collected from various instruments throughout the Project. This monitoring measures critical indicators of structural behavior. Data are collected, observations are made, and qualified personnel evaluate and make recommendations based on the collected data. Results are presented in reports and distributed to FERC and the DSOD. All facilities are observed and attended weekly. Periodic scheduled inspections are made less frequently (i.e., monthly, quarterly, or annually) for collection of monitoring data. The results of these inspections are recorded and placed into databases used for tracking history of the measurements.

Annual inspections are conducted with a Field Engineering Inspector from FERC and DSOD.

An integral part of the maintenance and monitoring program includes the Part 12D Independent Consultant's Inspection and reports completed every 5 years. These inspections and reports provide an independent, third party assessment of the instrumentation and performance-monitoring program. These reports also include recommendations by the independent inspector for any additional instrumentation that would improve monitoring. The devices used for monitoring civil structures and water conduits are described below.

As required by FERC regulation at Section 12.41, *Dam Safety Surveillance Monitoring Plan*, SSWD also completes and files with FERC periodic surveillance monitoring reports.

13.4.1 Leakage Weirs

Leakage weirs are located throughout Camp Far West Dam. The data are tabulated and provided to FERC in SSWD's periodic surveillance monitoring reports.

13.4.2 Survey Pedestals

Camp Far West Dam survey pedestals consist of 6-inch long steel pipes secured by concrete.

13.4.3 Level Sensors

Sensors provide for Camp Far West Reservoir elevations and are monitored by Sacramento SMUD P.S.O., including monitoring for high and low water conditions.

13.4.4 Loss of Pressure Alarm

There is a pressure sensor that provides a loss of pressure alarm to SCADA for the Camp Far West Powerhouse penstock.

13.5 Employee Safety and Public Safety Record

Based on California Division of Occupational Safety and Health Form 300 annual reports, from 2009 through 2016, there have been no lost-time accidents and therefore, no days away from work involving SSWD's Project operations employees.

From 2012 through 2017, there were no fatalities related to Project activities.

Table 13.5-1 lists non-Project related public safety incidents that occurred within the FERC Project Boundary.

Table 13.5-1. Public safety incidents occurring within the FERC Project Boundary not caused by Project related activities.

Date of Incident	Description of Incident
9/9/2015	Traffic Accident
10/14/2015	Traffic Accident
5/29/2016	Boating Accident
5/31/2017	Vehicle Accident

14.0 Current Operations

Current Project operations and constraints are described in Exhibit B.

15.0 History of the Project

Established in 1954, SSWD, located in Trowbridge, California, is a State of California public agency formed under California Water District Law, California Water Code Section 34000 et seq. to develop, store, and distribute surface water supplies for irrigation uses in SSWD's service area. In addition, Section 34000 et seq. authorizes SSWD to develop hydroelectric power in connection with SSWD's projects. SSWD is governed by a Board of Directors, whose seven members are elected by landowners within SSWD's service area.

SSWD's service area encompasses a total gross area of 63,972 acres (ac), of which 6,960 ac are excluded, for a net area of 57,012 ac. Approximately 40,107 ac are in Sutter County and 16,905

ac are in Placer County (Figure 1.1-1). In a normal year, over 35,500 ac within SSWD's service area are under irrigation, with approximately 29,110 ac (82%) in rice production, 3,905 ac (11%) in orchards, 2,130 ac (6%) in irrigated pastures, and 355 ac (1%) in miscellaneous row and field crops.

One of the first acts by SSWD when it was formed was to enlarge the existing Camp Far West Dam and Reservoir and to develop a water distribution system to augment and provide alternatives to a declining groundwater table that was being tapped by private agricultural wells within SSWD's service area. The first Camp Far West Dam was constructed in 1924-1925. SSWD's enlargement of the dam occurred in 1963-1964, and was part of the California State Water Plan to enhance water supply in California's Central Valley. Camp Far West Dam and Reservoir are not currently part of the State Water Project (SWP). Today, the annual available water supply in the enlarged Camp Far West Reservoir is totally allocated each year, but still represents only a portion of SSWD's users' demands.

In 1981, SSWD received from FERC a license to add the Camp Far West Powerhouse to the Project. The powerhouse was constructed in 1984-1985, and began commercial operation in 1986.

As described in Exhibits A, B and C of this Application for New License, at the direction of FERC and DSOD, SSWD is in the process of modifying the existing Camp Far West Dam Spillway to assure the spillway could accommodate the probably maximum flood wherein water would flow over the spillway rather than overtop the dam embankment thereby avoiding the risk of dam failure along with sudden and significant downstream flooding. SSWD anticipates that the spillway modification would be constructed of the course of 3 months in fall 2018 and 8 months in spring-summer 2019.

16.0 Generation Lost Over the Last Five Years

SSWD typically takes scheduled outages for about 2 to 3 weeks per powerhouse in the fall for annual maintenance. Work includes equipment maintenance, testing and inspecting, and cleaning and repair of water conduits. SSWD schedules the outages in this period because in the fall consumptive demands for irrigation water are minimal, power values are low, and there is a low probability of rain.

Unscheduled outages that impact the Project's power production may be caused by a variety of factors, many of which are beyond SSWD's control. "Momentary" outages may be caused by transmission trouble; SMUD is usually able to quickly restore the Project to service shortly after these occur. Unscheduled outages may also occur so that SSWD may respond to emergency conditions (e.g., response to equipment failure).

Table 16.0-1 lists unscheduled outages that extended for more than 24 hours from Calendar Years 2012 through 2017.

Table 16.0-1. Dates when the Camp Far West Powerhouse was shut down for unscheduled (forced) outages for more than 24 hours from Calendar Years 2012 through 2017 and the reason for each outage.

Period	Duration of Shut Down	Reason for Shut Down
1/16/16-2/13/16	28 days	Lost bearing due to high temperatures
Total	**28 days**	

17.0 SSWD's Compliance Record

SSWD is in compliance with terms and conditions of the existing license. During the annual FERC Project inspections and the 5-year environmental inspections, various remedial actions are recommended as a result of the inspections. SSWD initiates actions to correct any issues of safety, compliance or other issues as recommended from the inspections and provides written confirmation of the actions taken. In the event of a non-compliance action such as deviation from the required minimum flows, SSWD immediately notifies FERC, initiates an investigation and provides a written report to FERC regarding the incident and corrective action.

From 2012 through 2017, there were no non-compliance actions.

18.0 Actions Taken by SSWD Affecting the Public

The operation of Project reservoirs has the most significant direct benefit to the public by providing flat-water recreation opportunities. The operation of Camp Far West Reservoir for power generation, water supply and environmental purposes generally result in declining reservoir levels at the end of summer and into the winter, thus reducing the convenience and opportunity for recreation.

19.0 Ownership and Operating Expenses if License Is Transferred

Estimates of the Project O&M, administration, capital improvements and proposed mitigation costs are described in Exhibit D. If the license were transferred, the costs for future operations estimated would not be necessary, although some costs of operating the facilities for irrigation and consumptive water supply would remain. Other costs that would not be incurred include future capital improvements and the costs of proposed mitigation measures described in Exhibit D.

20.0 Annual Fees for Federal or Indian Lands

No federal lands or Native American tribal lands are included within the existing or proposed FERC Project Boundary.

21.0 List of Attachments

None.

22.0 References Cited

California State Water Resources Control Board (SWRCB). 1995. Water Quality Control Plan Report. Sacramento, California. Nine volumes.