

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



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

June 2019

©2019, South Sutter Water District. All Rights Reserved

Table of Contents
Description

Section No.	Description	Page No.
1.0	Introduction.....	D-1
2.0	Project Economics Approach.....	D-2
2.1	Current Cost Approach	D-2
3.0	Cost of Original Project	D-5
4.0	Cost of Project Takeover	D-5
5.0	Annual Cost of Operations and Gross Power Benefits Under the No Action Alternative.....	D-5
5.1	Cost of Operations	D-5
5.1.1	Depreciated Plant In-Service Costs	D-6
5.1.2	Power Purchase Contract Costs	D-7
5.1.3	Local, State and Federal Fees and Payments Unrelated to Environmental and Recreation Measures	D-7
5.1.4	Capital Addition Costs Unrelated to Environmental and Recreation Measures	D-7
5.1.5	Normal O&M Costs Unrelated to Environmental and Recreation Measures	D-8
5.1.6	FERC License Application Costs	D-8
5.1.7	Operating Reserve.....	D-8
5.1.8	Transmission Line Access Costs	D-9
5.1.9	Costs Related to Environmental and Recreation Measures	D-9
5.2	Gross Power Benefits.....	D-9
5.2.1	Project Capacity	D-10
5.2.2	Energy Generation	D-11
5.2.3	Unit Value of Power	D-14
5.2.4	Gross Power Benefits.....	D-16
5.2.5	Power Benefits Based on Replacement Power	D-17
5.3	Summary of No Action Alternative Costs and Power Benefits.....	D-18
6.0	Annual Cost of Operations and Gross Power Benefits Under SSWD’s Proposed Project	D-19
6.1	Proposed New Facilities	D-19
6.2	Annual Cost of Operations.....	D-20
6.2.1	O&M Costs Unrelated to Environmental and Recreation Conditions	D-20
6.2.2	O&M Costs Related to Environmental and Recreation Conditions	D-20
6.3	Annual Gross Power Benefits.....	D-23
6.3.1	Project Capacity	D-23
6.3.2	Energy Generation	D-23

Table of Contents (continued)

Section No.	Description	Page No.
6.3.3	Gross Power Benefits.....	D-24
6.3.4	Power Benefits Based on Replacement Power	D-25
6.4	Summary of SSWD’s Proposed Project Costs and Power Benefits	D-25
7.0	Changes in Project Power and Value.....	D-26
8.0	Recognition of Trends in California Power Market	D-27
9.0	Sources of Financing and Annual Revenues to Meet Project Costs.....	D-30
10.0	Need for Power	D-30
11.0	Other Developmental and Non-Developmental Benefits	D-31
11.1	Irrigation	D-31
11.2	Bay-Delta Contributions	D-32
12.0	Consequences of Denial of New License	D-32
13.0	List of Attachments.....	D-33
14.0	References Cited	D-33

List of Figures

Figure No.	Description	Page No.
8.0-1.	CAISO Net Load Curve - Mar 6 2017.....	D-28
8.0-2.	Natural gas futures through 2029.....	D-29
8.0-3.	Anticipated relative future generation prices.....	D-30

List of Tables

Table No.	Description	Page No.
2.1-1.	Assumptions SSWD used in developing costs and power benefits under SSWD’s Proposed Project.	D-4
5.1-1.	SSWD’s estimated average annual costs over 30 years in 2018 U.S. dollars for the No Action Alternative.	D-6
5.1-2.	Federal, State, and local fees and payments unrelated to environmental or recreation measures paid by SSWD in CY 2017.	D-7
5.2-1.	Historic total and average monthly gross generation in megawatt-hours for Calendar Years 2010 through 2017 at Camp Far West Powerhouse.....	D-11
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.....	D-11
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.....	D-12

List of Tables (continued)

Table No.	Description	Page No.
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.....	D-13
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.....	D-14
5.2-6.	Anticipated energy prices for Camp Far West Powerhouse after the SMUD Contract expires in 2031 based on current CAISO prices.....	D-16
5.2-7.	Simulated average annual gross power benefits in 2018 U.S. dollars for the No Action Alternative.	D-17
5.3-1.	SSWD’s estimate of average annual costs and power benefits in 2018 U.S. dollars under the No Action Alternative.	D-18
6.1-1.	SSWD’s estimated costs for construction of the Camp Far West Reservoir Pool Raise.	D-19
6.2-1.	SSWD’s estimated average annual costs over 30 years in 2018 U.S. dollars for the No Action Alternative.	D-20
6.2-2.	SSWD’s estimated costs in 2018 dollars related to implementation of SSWD’s Proposed Conditions as part of continued operation of the Project.	D-21
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.	D-23
6.3-2.	Simulated average annual gross power benefits in 2018 U.S. dollars for SSWD’s Proposed Project.	D-24
6.4-1.	SSWD’s estimate of average annual costs and power benefits in 2018 U.S. dollars under SSWD’s Proposed Project.	D-26
7.0-1.	Comparison of annual power benefits, costs net benefits between No Action Alternative and SSWD’s Proposed Project.....	D-26

List of Attachments

None.

Page Left Blank

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 costs¹ 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
<i>Subtotal</i>	<i>\$10,486,550</i>	<i>\$878,258</i>	<i>\$1,210,443</i>
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
<i>Subtotal</i>	<i>\$9,388,000</i>	<i>\$0</i>	<i>\$312,933</i>
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 license 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
<i>Annual Average for 2021 through 2031</i>	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
<i>Annual Average for 2032 through 2051</i>	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
<i>Annual Average for 2021 through 2031</i>	<i>8,034</i>	<i>12,718</i>	<i>20,752</i>
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
<i>Annual Average for 2032 through 2051</i>	<i>8,034</i>	<i>12,718</i>	<i>20,752</i>
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 Power⁸

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
<i>Annual Average for 2021 through 2031</i>	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
<i>Annual Average for 2032 through 2051</i>	20,752	--	\$584,598	\$0	\$584,598
Weighted Annual Average for 2021 through 2051³	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
<i>Subtotal - Value in 2018 Dollars</i>	\$0
Energy ³	20,752 MWh
<i>Subtotal Energy⁴</i>	\$759,002
<i>Subtotal - Value in 2018 Dollars⁴</i>	\$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. Dollars⁷	-\$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
<i>Subtotal Base Construction Cost (BCS)</i>	<i>\$2,254,344</i>
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
<i>Subtotal Estimated Cost with Contingency</i>	<i>\$1,623,000</i>
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
<i>Subtotal</i>	\$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
<i>Subtotal</i>	\$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.
	<i>North Shore Recreation Area</i>	\$5,563,000	\$0	\$185,433	
	<i>South Shore Recreation Area</i>	\$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
<i>Annual Average for 2021 through 2031</i>	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
<i>Annual Average for 2032 through 2051</i>	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
<i>Annual Average for 2021 through 2031</i>	<i>21,200</i>	<i>--</i>	<i>\$235,792</i>	<i>--</i>	<i>\$1,135,792</i>
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
<i>Annual Average for 2032 through 2051</i>	<i>21,200</i>	<i>--</i>	<i>\$599,237</i>	<i>--</i>	<i>\$599,237</i>
Weighted Annual Average for 2021 through 2051³	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
<i>Subtotal - Value in 2018 Dollars</i>	\$0
Energy ³	21,200 MWh
<i>Subtotal Energy³</i>	\$743,908
<i>Subtotal - Value in 2018 Dollars³</i>	\$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. Dollars⁷	-\$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
<i>Subtotal - Value in 2018 Dollars</i>	--	--	--
Energy	20,752 MWh	21,200 MWh	+448 MWh
<i>Subtotal - Value in 2018 Dollars</i>	\$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 54.4 percent 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 through 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.

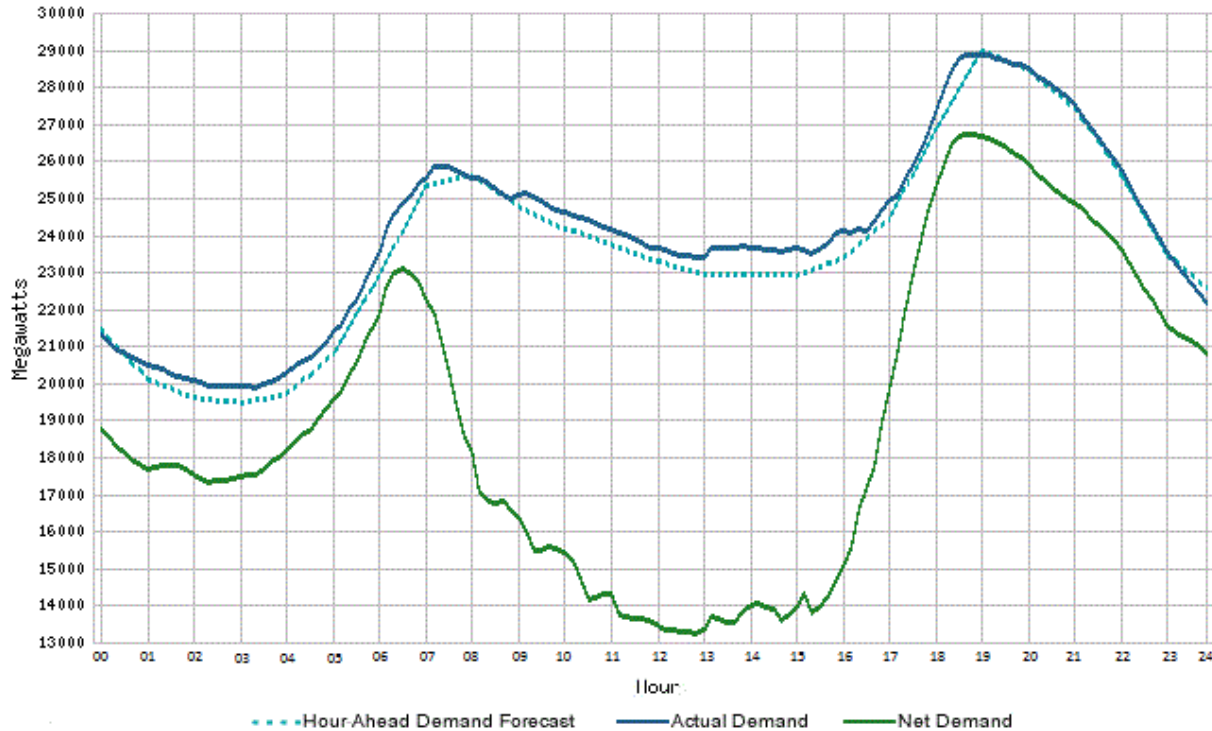


Figure 8.0-1. CAISO Net Load Curve - Mar 6 2017.

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).

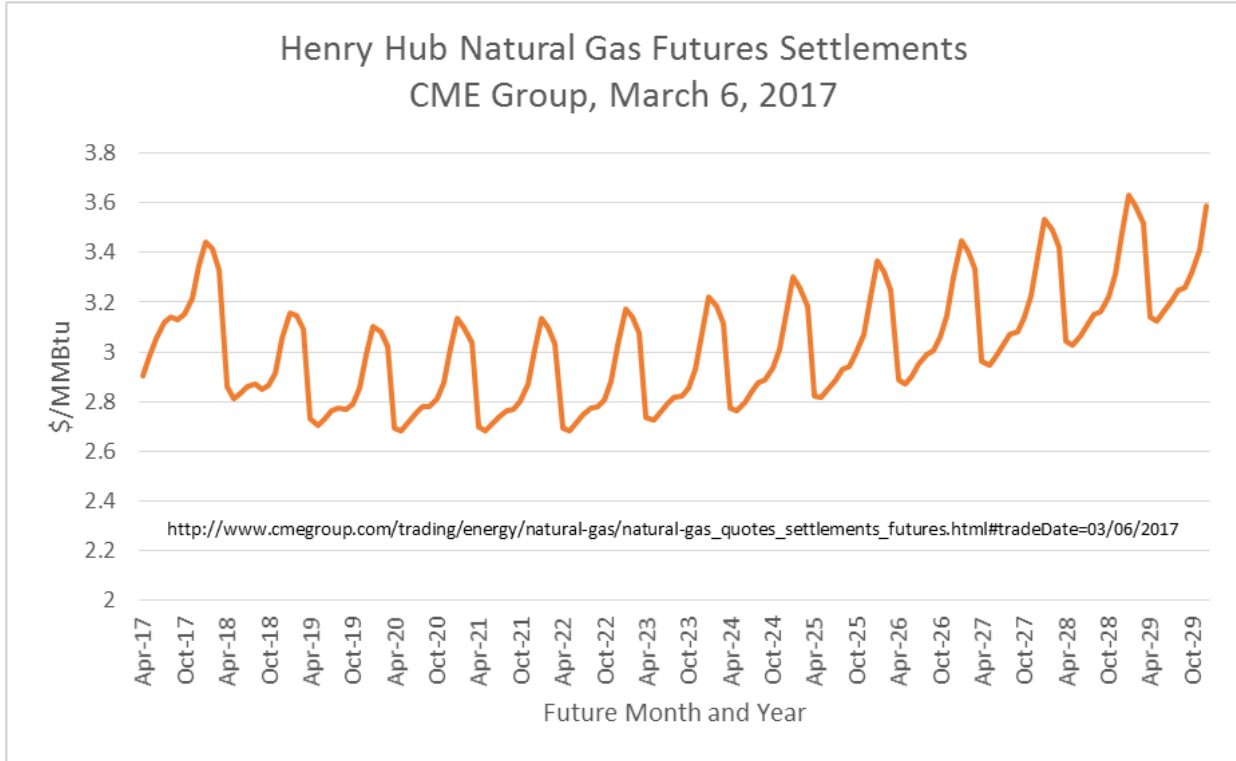


Figure 8.0-2. Natural gas futures through 2029.

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.)

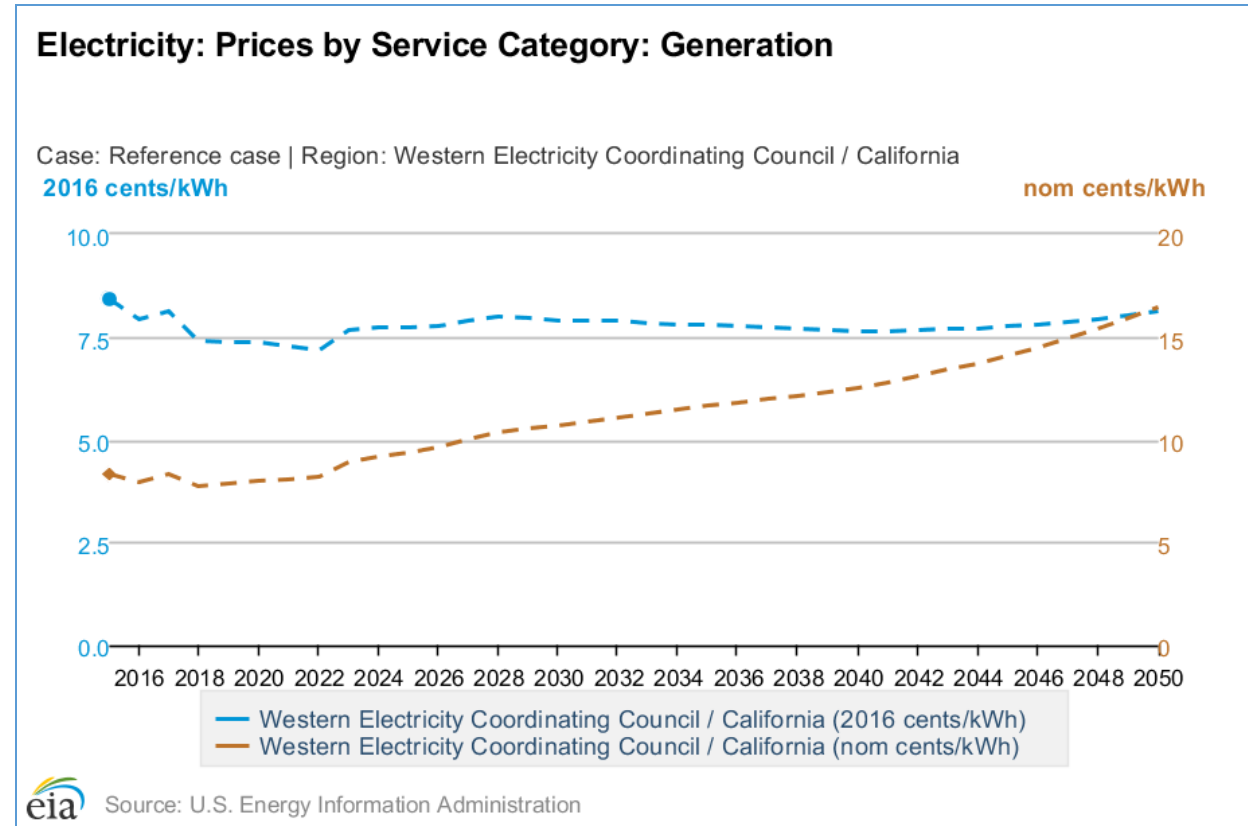


Figure 8.0-3. Anticipated relative future generation prices.

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.

_____. 1991. Evaluating Relicensing Proposals at the Federal Energy Regulatory Commission. Paper No. DPR-2. Washington, DC.

Page Left Blank