SECTION 4.0

DEVELOPMENTAL ANALYSIS

This section analyzes the economic power benefits of the Projects, and estimates the annual cost of the Project, including costs for any construction, operation, maintenance, and environmental conditions. This section also discusses other development benefits.

Under the Commission'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] This section uses the Commission's current cost method.

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 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.

[1] Developmental benefits of the Project include power generation, water supply, flood control, irrigation and river navigation.
[2] Non-developmental benefits of a waterway include fish and wildlife resources, recreational opportunities and other aspects of environmental quality.

4.1 Alternatives Considered in This Section

This section analyzes two alternatives.

- No Action Alternative. 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 FEIS for upstream NID's Yuba-Bear Project (FERC Project No. 2266) and PG&E's Drum-Spaulding Project (FERC Project No. 2310), 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 SMU and SSWD 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 WY 1976 through WY 2014 using SSWD's 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 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's proposed Pool Raise;[3] and SSWD's proposed PM&E measures in this 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.

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

- 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.

4.2 Power and Developmental Benefits

Table 4.2-1 summarizes the assumptions and economic information used in this analysis that are common to both the No Action Alternative and SSWD's Proposed Project.

Table 4.2-1. Assumptions and cost items common to the No Action Alternative and SSWD's Proposed Project.

Assumption / Cost Item	Value or Average Annual Cost
Period of Analysis[1]	30 Years
Term of Financing[1]	30 Years
Insurance Rate[2]	0%
Base Year for Costs and Benefits[1]	Calendar Year 2018, unless otherwise specified
Interest Rate[1]	2.0%
Discount Rate[1]	5.0%
Depreciated Plant In-Service Costs[2]	$0
Power Purchase Contract Costs[2]	$20,000
Local, State and Federal Fees and Payments Unrelated to Environmental and Recreation Measures[2]	$87,500
Capital Additions Costs Unrelated to Environmental and Recreation Measures[2]	$332,185
Normal O&M Costs Unrelated to Environmental and Recreation Measures[2]	$665,667
Recovery of FERC Licensing Application Costs[2]	$16,667
Operating Reserve[2]	$87,424
Transmission Costs[2]	$1,000
Authorized Installed Nameplate Capacity[3]	6,800 kW
Dependable Capacity[4]	0 kW

[1] As described in Table 2.1-1 in Exhibit D of this Application for New License.
[2] As described in Tables 5.1-1 and 6.2-1 in Exhibit D of this Application for New License.
[3] As described in Section 5.2.1.1 and Section 6.3.1 in Exhibit D of this Application for New License.
[4] As described in Section 5.2.1.3 and Section 6.3.1 in Exhibit D of this Application for New License.

Table 4.2-2 summarizes the assumptions and economic information used in this analysis that are unique to either the No Action Alternative or to SSWD's Proposed Project.

Table 4.2-2. Assumptions and cost items not common to the No Action Alternative and SSWD's Proposed Project.

Assumption / Cost Item	Value or Average Annual Cost	
	No Action Alternative	SSWD's Proposed Project
Average Annual Energy[1]	20,752 MWh	21,200 MWh
Average Annual Value of Energy[2]	$759,002	$743,908
Average Annual Environmental/Recreational Operating Costs ($2016/yr)[3]	$312,933	$442,800

Table 4.2-2. (continued)

Assumption / Cost Item	Value or Average Annual Cost	
	No Action Alternative	SSWD's Proposed Project
Average Annual Pool Raise Costs[4]	--	$155,755

[1] As described in Tables 5.2-4 and 6.3-1, respectively, in Exhibit D of this Application for New License.
[2] As described in Tables 5.2-7 and 6.3-2, respectively, in Exhibit D of this Application for New license.
[3] As described in Section 5.1.9 and 6.2-2, respectively, in Exhibit D of this Application for New License.
[4] As described in Section 6.1 in Exhibit D of this Application for New License.

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 4.2-3. SSWD's estimated annual cost to implement the conditions is $442,600.

Table 4.2-3. 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 4.2-3. (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 NMFS's Section 18 fishway prescriptions, if any; NMFS's and USFWS's measures that may be included in an ESA BO, if any, for the Project; the SWRCB's CWA 401 WQC, 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.

4.3 Comparison of Alternatives

Table 4.3-1[4] compares the benefits (i.e., capacity, energy and ancillary services), costs (i.e., non-environmental/recreation and environmental/recreation) and net benefits of the No Action Alternative and SSWD's Proposed Project.

Table 4.3-1. 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 in Exhibit D of this Application for New License.

[2] From Table 6.4-1 in Exhibit D of this Application for New License.

[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 4.3-1.)

[4] Table 4.3-1 is essentially the same as Table 7.0-1 in Exhibit D of this Application for New License.

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 4.3-1).

The overall average annual Project net benefit would decrease by $302,259, or by 40.0 percent (Table 4.3-1). 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.

4.4 Other Developmental and Non-Developmental Benefits

This section describes other developmental and non-development benefits.

4.4.1 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 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 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 CFWID's 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.

4.4.2 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 (SWRCB 1995).

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.

4.5 List of Attachments

None.

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