

**SECTION 2**

**EXISTING AND PROPOSED PROJECT**

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This section includes two major sub-sections: Section 2.1 describes the existing Project, and in particular: facilities and features; FERC Project Boundary; safety; operations; environmental measures; Project maps, design drawings and recreation maps; SSWD’s compliance history; and SSWD’s current net investment in the Project. Section 2.2 describes any changes SSWD proposes to the existing Project.

**2.1 Existing Project**

**2.1.1 Facilities and Features**

The existing Project includes one development. Existing Project facilities are shown in Figure 1.1-2 in Section 1.

The Project does not include any open water conveyance facilities, transmission lines, or active borrow or spoil areas. Nor does the Project include the diversion dam located downstream from Camp Far West Dam, or SSWD’s Conveyance Canal or CFWID’s Camp Far West Canal, or the intake structures to these water delivery canals.

Table 2.1-1 and Table 2.1-2 summarize key information for the Project’s powerhouse and reservoir, respectively.

**Table 2.1-1. Key information regarding the Camp Far West Hydroelectric Project’s powerhouse.**

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

<sup>1</sup> Manufacturer’s stated turbine and/or generator capacity, as shown on equipment nameplate.  
<sup>2</sup> Defined as the average available capacity during the period of highest demand within the driest recent historical period, which for this purpose is July and August 1977.  
<sup>3</sup> Megawatt hours: 1,000 kilowatt hours.

**Table 2.1-2. Key information regarding the Camp Far West Hydroelectric Project’s reservoir.**

Project Reservoir	NMWSE (ft)	Gross Storage <sup>1</sup> (ac-ft)	Usable Storage <sup>2</sup> (ac-ft)	Surface Area (ac)	Maximum Depth (ft)	Shoreline Length (mi)	Drainage Area At Dam (sq mi)
Camp Far West	300	93,740	92,430	1,886	160	29	284

<sup>1</sup> At Normal Maximum Water Surface Elevation (NMWSE).  
<sup>2</sup> Defined as the reservoir storage between storage at NMWSE and at a storage at a reservoir elevation of 175 ft, below which the reservoir storage is not available for release (i.e., dead storage).

Existing Project facilities and features are described below.

### **2.1.1.1 Main Dam and Auxiliary Dams**

#### **2.1.1.1.1 Main Dam**

The main embankment of the dam is a zoned earthfill structure which is 185 ft high, 40 ft wide at the crest and 2,070 ft long. The dam has variable 2 to 1, 2.5 to 1, and 3 to 1 upstream slopes, with a 60-ft wide beam at elevation 200 ft, and a 2 to 1 downstream slope. The crest of the dam is at elevation 320 ft.

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

#### **2.1.1.1.2 North and South Wing Dams**

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

#### **2.1.1.1.3 North Dike**

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

### **2.1.1.2 Reservoir**

When the main dam was built, the reservoir had a surface area of 2,020 ac and storage volume of 104,000 ac-ft at the NMWSE of 300 ft. Based on recent bathymetric surveys, the current reservoir surface area is 1,886 ac with a storage capacity of approximately 93,740 ac-ft at the NMWSE of 300 ft. The reservoir contains 1,310 ac-ft and has a surface area of about 55 ac at its minimum operating elevation of 175 ft. Maximum reservoir depth is approximately 150 ft, relative to the NMWSE.

### **2.1.1.3 Spillway**

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

### **2.1.1.4 Intakes**

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

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

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

### **2.1.1.5 Conveyance Systems**

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

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

The power intake connects to a 760-ft-long, 8-ft diameter concrete tunnel through the left abutment of Camp Far West Dam that conveys water directly to the Camp Far West Powerhouse.

### **2.1.1.6 Powerhouse**

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

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

### 2.1.1.7 Camp Far West Switchyard

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

### 2.1.1.8 Recreation Facilities

There are two developed recreational areas on the Camp Far West Reservoir, both of which are owned by SSWD and leased to a private concessionaire to operate. The North Shore Recreation Area (NSRA) is located off of Camp Far West Road in Wheatland, CA. This campground is currently open year-round. The South Shore Recreation Area (SSRA) is located off of McCourtney Road in unincorporated Lincoln, CA, and is only open from mid-May until September. The boat launching facility at the NSRA was reconstructed in 2003-2004. Details of the facilities at the NSRA and the SSRA are included in Table 2.1-3.

**Table 2.1-3. Camp Far West Hydroelectric Project recreation facilities.**

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

<sup>1</sup> The group campsites use the adjoining family campground restroom building.

<sup>2</sup> Parking is available in open areas adjacent to the group sites, but is not designated or defined.

<sup>3</sup> The day use area (picnic area and swim beach) uses the adjoining boat ramp parking area for parking.

<sup>4</sup> The picnic area uses the adjoining boat ramp restroom building.

<sup>5</sup> The dispersed use areas provide day use and overnight opportunities with minimal facilities (roads, portable chemical toilets and trash cans).

### 2.1.1.9 Gages

Flow data for the Project comes from five gages, of which two are publicly-available (Table 2.1-4). SSWD also measures spill through the Camp Far West Dam spillway by indirect stage method.

**Table 2.1-4. Streamflow and other gages in the Camp Far West Hydroelectric Project Vicinity.**

United States Geological Survey (USGS) Identifier	California Data Exchange Center (CDEC) Identifier	Gage Name	Measures
--	--	Bear River above Camp Far West Reservoir	Low flows for Downstream Compliance (seasonal)
--	--	Camp Far West Dam Low-Level Outlet Flowmeter <sup>1</sup>	Low-level outlet discharge
--	--	Camp Far West Powerhouse Flowmeter <sup>1</sup>	Powerhouse discharge
11423700 <sup>2</sup>	CFW <sup>3</sup>	Bear River at Camp Far West Dam (Camp Far West Reservoir)	Reservoir Stage
11423800 <sup>4</sup>	CFW <sup>5</sup>	Bear River Fish Release below Camp Far West Reservoir	Compliance with Flow Requirements

<sup>1</sup> Flowmeters below Camp Far West Dam at low-level outlet and powerhouse are maintained by Sacramento Municipal Utility District (SMUD) and data are not reported publicly.

<sup>2</sup> USGS gage 11423700 measured Camp Far West Reservoir storage, but has not been reported by USGS since September 30, 1983.

<sup>3</sup> CDEC gage CFW, maintained by DWR Flood Management, reports end-of-month Camp Far West Reservoir storage and stage.

<sup>4</sup> USGS Gage 11423800, maintained by USGS, reports river stage and flow below the non-Project diversion dam for compliance with the FERC license. It is not a full flow gage.

<sup>5</sup> CDEC gage CFW also reports river stage and flow downstream from Camp Far West Dam.

Seven gages exist downstream of the Project. One is a stage gage that measures the stage of the pool formed by the diversion dam, and the other six are flow gages. One flow gage is located on CFWD's canal on the north side of the river to measure diversions into the canal from the Bear River. Two flow gages are located on SSWD's Conveyance Canal on the south side of the river. One gage measures diversions from the Conveyance Canal into a side canal for deliveries to the CFWD's use on the south side of the river, and the second gage is located further along the canal and measures flow in the canal at that point. The fourth flow gage measures spill over the diversion dam. The fifth flow gage is USGS Gage 11424000, *Bear River near Wheatland*, reported by California Data Exchange Center (CDEC) as BRW, *Bear River near Wheatland*, located 6.5 mi downstream from Camp Far West Dam, 200 ft downstream of the State Highway 65 bridge crossing. This is a full-flow gage. USGS and DWR maintain this full-flow gage. The last flow gage is CDEC Gage BPG, *Bear River at Pleasant Grove Road*, a full-flow gage maintained by DWR and located 10.5 mi downstream from Camp Far West Dam.

### 2.1.1.10 Primary Roads

There are no Primary Project roads included as part of the FERC-licensed Project facilities.

## 2.1.2 Project Boundary

The FERC Project Boundary is intended to consist of all lands necessary for the safe operations and maintenance of the Project and other purposes, such as recreation, shoreline control, and

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

### **2.1.3 Safety**

The Project has been operating for more than 35 years under the existing license and during this time FERC staff has conducted operational inspections focusing on the continued safety of the structure, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, the Project has been inspected and evaluated every 5 years by an independent consultant and a consultant's safety report has been submitted for FERC's review. SSWD has a strong commitment to employee and public safety, which is reflected in its safety procedures and training program, and its safety record.

In 2005, the probable maximum flood (PMF) was recalculated for the Camp Far West Hydroelectric Project, resulting in a Camp Far West Dam spillway capacity of less than the PMF and consequently inadequate spillway capacity. Since the existing spillway capacity at NMWSE (i.e., 106,500 cfs) is less than re-calculated peak outflow during the PMF (i.e., 126,500 cfs), the spillway capacity needs to be increased to comply with FERC regulations. This will require modification of the spillway to safely pass the PMF without the dam overtopping. SSWD is coordinating with FERC and the California Division of Safety of Dams to modify the spillway to accommodate the PMF, and SSWD expects the spillway modifications to be complete in 2017. The spillway work will not affect reservoir storage or operations.

### **2.1.4 Operations**

#### **2.1.4.1 Assurance of Public and Employee Safety**

Safety is SSWD's first and foremost operational consideration. SSWD operates the Project in a safe manner and provides its employees with all necessary training and equipment to operate the Project safely. SSWD cooperates fully with FERC during inspections of Project facilities, including annual FERC inspections, Part 12 Dam Safety Inspections, and Environmental and Public Use Inspections, and in other similar safety-related areas such as requirements for appropriate Emergency Action Plans and Public Safety Plans.

#### **2.1.4.2 Anticipated Water Availability**

One of SSWD's major considerations each year is anticipated water availability. SSWD begins estimating water availability each year in January and continually updates the estimate

throughout the spring runoff period. When estimating available water supply, SSWD considers current Camp Far West Reservoir storage and estimates of upstream storage and water releases.<sup>1</sup> These estimates of water availability are then compared to SSWD's estimates of water needs, including required releases to meet flow requirements and for consumptive water deliveries, and target levels for fall carryover storage in Camp Far West Reservoir.

### **2.1.4.3 Typical Operations**

The Project is operated primarily to provide irrigation water to growers in SSWD's and CFWID's service districts. However, SSWD also operates the Project to meet Bear River flow requirements and to generate power. SSWD leases the power generating facilities to SMUD, which operates the Camp Far West Powerhouse and switchyard.

Although the specific water availability can vary widely, normal Project operation is to fill the reservoir as early in the season as sufficient water becomes available and to then spill the excess flows over the ungated spillway. Because the reservoir is primarily fed by rainfall-produced runoff, it is difficult to predict the amount of inflow anticipated before the end of the season; therefore, SSWD retains within the reservoir all of the inflow except releases for requirements for fisheries until the beginning of the irrigation season. Since the reservoir is operated as a fill-and-spill system, its effect on downstream flood flows is erratic, as it may range from complete control to only minor surcharge regulation.

Camp Far West Reservoir does not have any dedicated flood control space or associated flood control rules.

In most years, the reservoir reaches NMWSE in January when the basin produces its heaviest runoff, and then starts to decline in April or May as releases for irrigation increase, and reaches its lowest point in the mid-October period when irrigation deliveries are no longer made.

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

During the irrigation season, up to a maximum of 530 cfs will pass through the powerhouse in conformance with downstream irrigation and instream requirements. However, during the heavy runoff period, when spilling from the reservoir occurs, a greater quantity of water is routed through the powerhouse up to its maximum limit of 725 cfs.

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<sup>1</sup> Unlike other tributaries to the Feather River, DWR does not forecast unimpaired flow in the Bear River.

When the reservoir water surface is high enough to send flows over the spillway, all flows up to approximately the physical capacity of the turbine are diverted through the power tunnel. The balance of any flows greater than turbine capacity are passed over the uncontrolled spillway.

During normal reservoir releases for furnishing irrigation water, all releases are utilized for power production except under those conditions as described above when the combination of head and flow are outside the operating characteristics of the turbine. During dry periods outside of the irrigation season, reservoir releases can be limited to minimum instream flow requirements, which are at times controlled by inflow per the existing license (see Article 29). Inflow from the Bear River is measured during the low-flow season by SSWD in the Bear River immediately upstream of Camp Far West Reservoir.

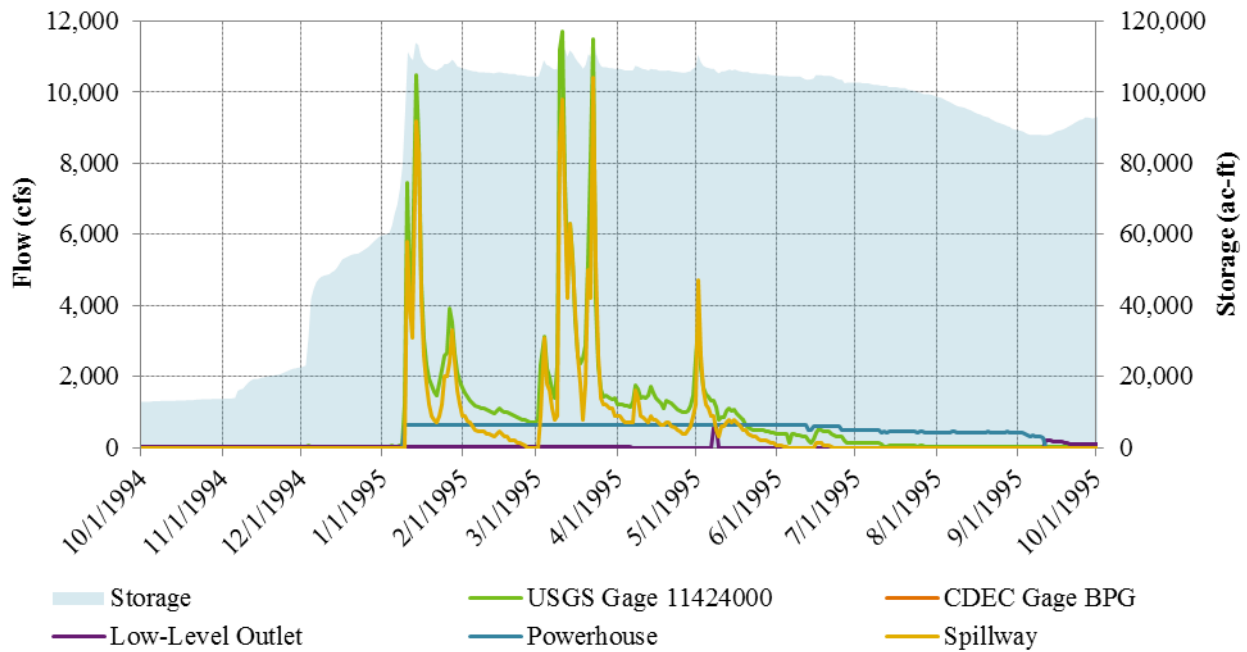
Operation of the powerhouse is automatic except for start-up, which is done manually. A powerhouse shutdown activates an alarm at SMUD's dispatch center, which requires sending trained personnel to the site to determine the problem and re-start the powerhouse.

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

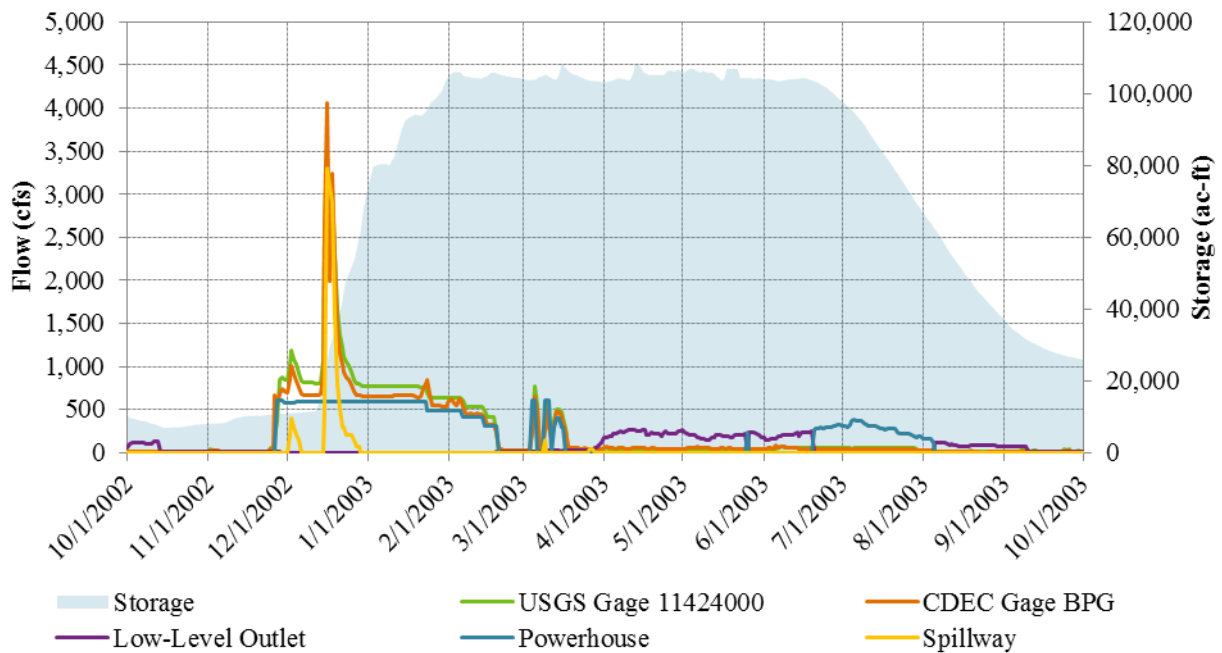
#### **2.1.4.4 Operations in Representative Wet, Normal, and Dry Water Years**

To demonstrate normal operations, SSWD has selected 1995, 2003, and 2001 as representative Wet, Normal, and Dry water years (WY), respectively, because these years approximate the 10, 50, and 90 percent exceedance intervals, respectively, for annual flow volume as measured at USGS Gage 11424000 (Bear River near Wheatland; this gage was selected as it is the nearest full-flow gage to Camp Far West Dam). Figures 2.1-1 through 2.1-3 show for each representative WY: 1) mean daily water storage in Camp Far West Reservoir; 2) mean daily water releases from Camp Far West Dam and Powerhouse (i.e., releases through the powerhouse, low-level outlet and over the spillway); 3) mean daily flows at USGS Gage 11424000 located about 6.5 mi downstream from Camp Far West Dam near Wheatland; and 4) mean daily flow at CDEC Gage BPG, located approximately 10.5 mi downstream from the Camp Far West Dam near Pleasant Grove Road.

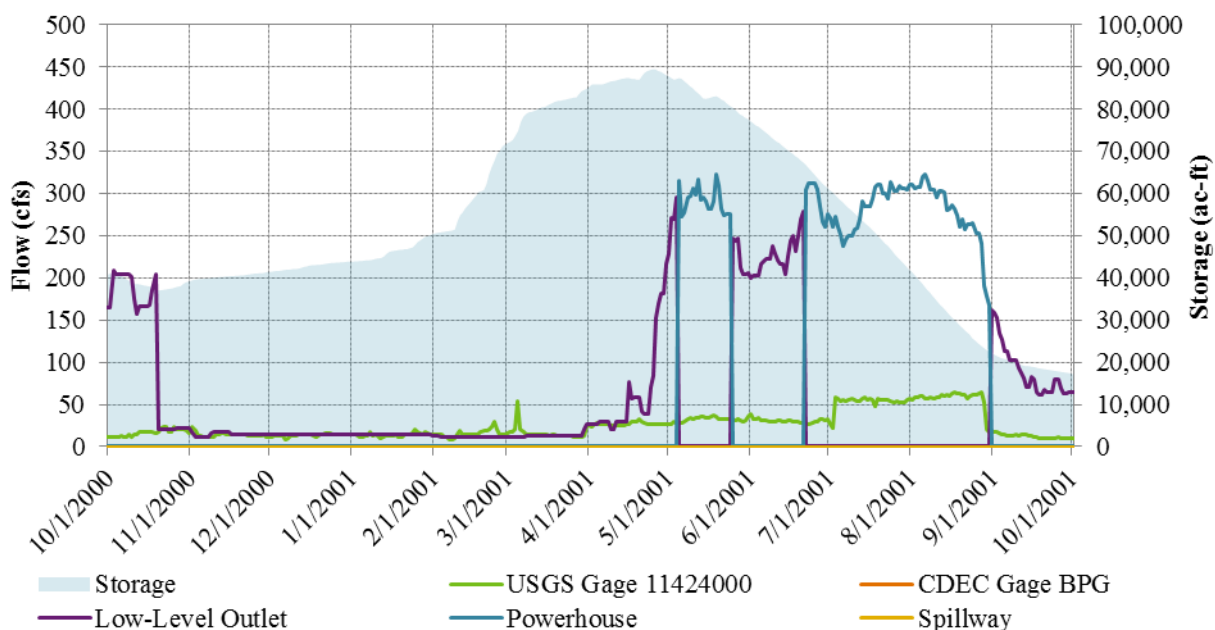




**Figure 2.1-1. Camp Far West Hydroelectric Project releases and storage in a representative Wet Water Year – 1995 (CDEC Gage BPG was unavailable for 1995).**



**Figure 2.1-2. Camp Far West Hydroelectric Project releases and storage in a representative Normal Water Year – 2003.**



**Figure 2.1-3. Camp Far West Hydroelectric Project releases and storage in a representative Dry Water Year – 2001 (CDEC gage BPG was unavailable for 2001).**

Generally, Camp Far West Reservoir fills in winter and spring by catching rainfall and snowmelt runoff and is drawn down in the summer and fall to meet minimum flow requirements and water delivery demands. Water is released from Camp Far West Reservoir from mid-April to mid-October for water deliveries. Water is diverted at the non-Project diversion dam located immediately downstream of Camp Far West Dam. Starting in 2001, water was transferred in dry and critically dry years according to the Bay-Delta Settlement Agreement, as shown in July and August in Figure 2.1-1.

Refer to Appendix F for hydrologic information for the Project. Specifically, the appendix includes for WYs 1976 through 2014: 1) mean daily releases from the Project powerhouse; 2) total mean daily flow below Camp Far West Dam (i.e., the sum of the powerhouse discharge, dam spill and low-level outlet release); 3) mean daily fish release flow immediately downstream of the non-Project diversion dam, the flow compliance location in the existing Project license; 4) daily Camp Far West Reservoir water surface elevation and storage; and 5) other pertinent hydrologic information. Data are provided in the United States Army Corps of Engineers’ (USACE) Hydrologic Engineering Center’s (HEC) Data Storage System (DSS) format and in Microsoft Excel format, and monthly duration curves are provided for flow.

### 2.1.4.5 Monthly and Annual Energy Generation and Dependable Capacity

#### 2.1.4.5.1 Monthly and Annual Energy Generation

Table 2.1-5 shows the total monthly generation at Camp Far West Powerhouse for the 5-year period from 2010 through 2014.

**Table 2.1-5. Average monthly gross generation at the Camp Far West Hydroelectric Powerhouse for calendar years 2010 through 2014.**

Month	Monthly Total Generation (MWh)					Average Generation (MWh)
	2010	2011	2012	2013	2014	
January	0	5,369	0	5,436	0	2,161
February	239	4,882	0	3,861	0	1,797
March	2,191	5,420	2,817	1,258	0	2,337
April	2,900	5,087	5,035	176	2,040	3,048
May	4,930	5,229	4,384	3	448	2,998
June	3,846	4,437	1,770	41	0	2,019
July	4,402	3,590	2,207	844	1,856	2,580
August	3,323	3,491	1,695	1,272	1,512	2,259
September	643	972	165	39	0	364
October	0	0	0	0	0	0
November	931	0	0	0	0	186
December	4,737	3	5,020	0	6	1,953
<b>Total</b>	<b>28,143</b>	<b>38,482</b>	<b>23,093</b>	<b>12,929</b>	<b>5,861</b>	<b>21,702</b>

A small amount of the generated power is used at the powerhouses for station use.

#### 2.1.4.5.2 Dependable Capacity

The dependable capacity of a hydropower generating facility is generally defined as the generating capacity that a plant can deliver under the most adverse water supply conditions to meet the needs of an electric power system with a given maximum demand. One of the critical parameters for defining dependable capacity is the period over which the capacity must be provided. Traditionally, a season that coincides with peak seasonal demand is used for the time period over which capacity is calculated. For base load generation in California, the time period of the most adverse hydrology was the WY 1977; therefore, the period of July and August 1977 was used for this analysis. Based on this time period and historical information provided during the development of the Project, dependable capacity of the Project is estimated at 3,750 kW.

#### 2.1.4.6 Project Operations Model

SSWD developed a water operations model (Operations Model or Ops Model) of Camp Far West Reservoir and associated hydropower and irrigation facilities. The Ops Model is a tool to examine water supply and hydropower generation under a variety of hydrologic and operational conditions. The Ops Model was developed to meet the following goals:

1. It can be used by all interested Relicensing Participants during the Relicensing to simulate current and potential future operations of the Camp Far West Hydroelectric Project (the Project).
2. All Relicensing Participants agree the Ops Model is reasonably reliable for these purposes.
3. Relicensing Participant agree to use this single Ops Model to make Relicensing recommendations.

The Ops Model addresses operational decisions including: stream flow requirements, water supply, recreation, and hydropower generation. The Ops Model simulates operations subject to the physical constraints of the Project; including maximum and minimum reservoir, outlet, and powerhouse capacities. Ops Model logic focuses on operations of Camp Far West Reservoir. The Ops Model simulates operations at Camp Far West Dam and the downstream non-Project diversion dam. Diversions into SSWD’s Conveyance Canal and Camp Far West Irrigation District’s (CFWID) North Canal and South Canal are simulated at the non-Project diversion dam. Irrigation diversions are based on estimated agricultural demands and simulated allocations. The Ops Model also includes a representation of the Bear River downstream of the diversion dam to the confluence of the Bear and Feather rivers. Three additional stream nodes are located downstream of the diversion dam: Bear River at Wheatland, Bear River at Pleasant Grove Road, and the Bear River at the confluence with the Feather River. Table 2.1-6 provides a summary of output available from the Ops Model and Figure 2.1-4 is an overview of the Project, SSWD, CFWID, and Ops Model nodes.

**Table 2.1-6. Summary of Ops Model nodes and outputs.**

Project Nodes		Nodes below Project	
Model Node	Model Output	Model Node	Model Output
Camp Far West Reservoir	Storage and elevation	CFWID North Canal	Diversion
Camp Far West Powerhouse	Generation and release through turbine	CFWID South Canal	Diversion
Camp Far West Dam	Release from low-level outlet and spillway	SSWD Main Canal	Diversion
		Non-Project Diversion Dam	Estimated flow below dam
		Bear River at Wheatland	Estimated flow
		Bear River at Pleasant Grove Road	Estimated flow
		Bear River at Feather River	Estimated flow

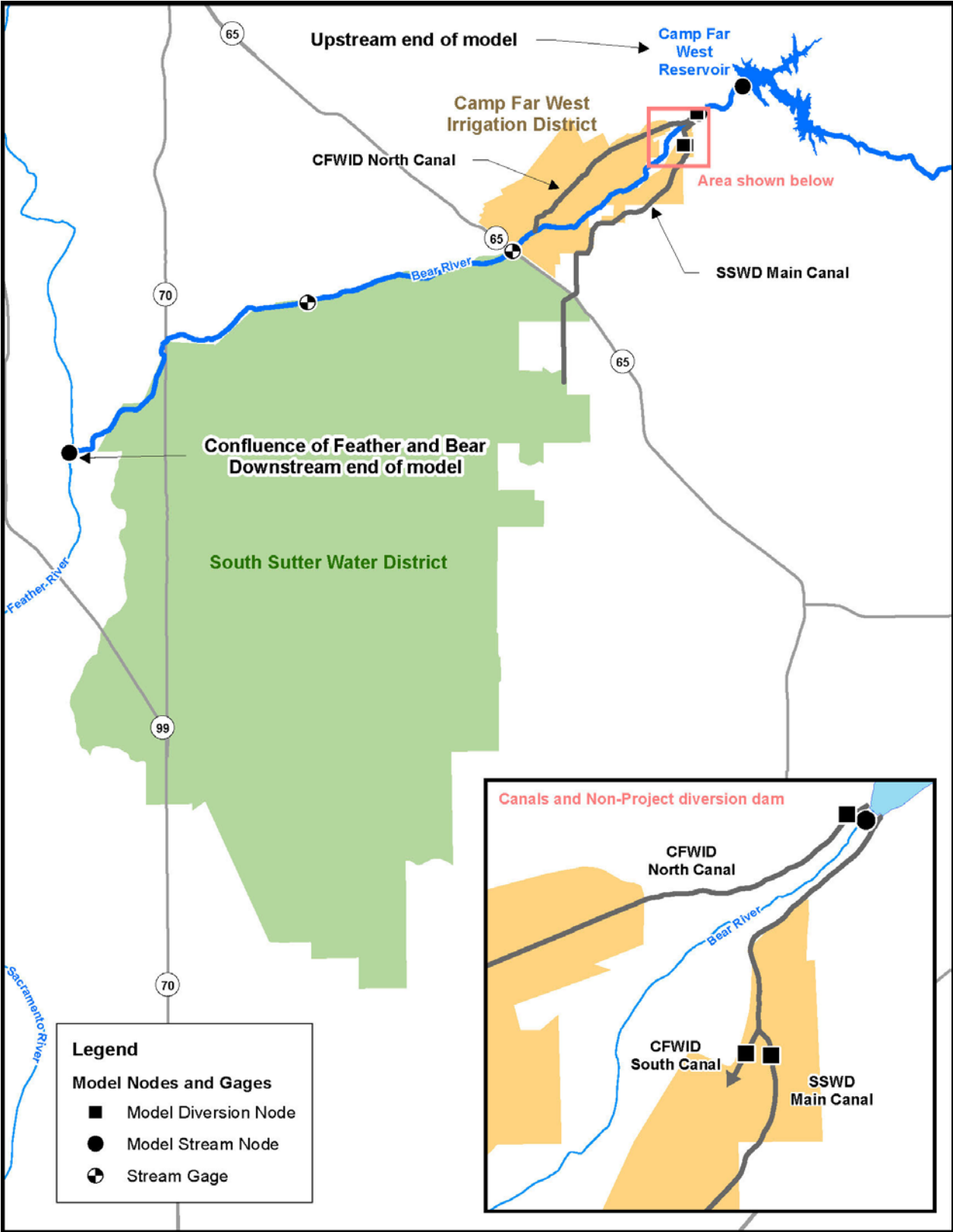


Figure 2.1-4. Camp Far West Hydroelectric Project, SSWD, CFWID, and Ops Model nodes.

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

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

The Ops Model includes preliminary WY types based on WY types proposed for Nevada Irrigation District's (NID) Yuba-Bear Project and Pacific Gas and Electric's (PG&E) Drum-Spaulding Project, collectively the Yuba-Bear Drum Spaulding (YB/DS) Projects. WY types are used in the Ops Model for reporting model results and to evaluate potential operational decisions. SSWD may re-evaluate these WY types based on information developed during Relicensing.

The Ops Model was developed and validated with inputs designed to represent historical operations and historical inflow. The Ops Model was then used to develop two separate baseline simulations representing near-term and future conditions and YB/DS Projects operations and demands. The YB/DS Projects is currently in the process of being relicensed and the Final License Application (FLA) was filed in April of 2011. Therefore, upstream operations are expected to change in the near future and those changes will affect inflow into Camp Far West Reservoir and SSWD's operations. Inflow into Camp Far West was provided by HDR Inc., consultant to NID and PG&E for relicensing, based on a model of the YB/DS Projects. Two different inflow scenarios are included in the Ops Model. The first scenario, Near-Term Conditions, assumes YB/DS Projects operations with assumed new FERC license requirements based on the FERC-issued Final Environmental Impact Statement for both projects<sup>2</sup> and the current level of development upstream. The second scenario, Future Conditions, assumes YB/DS Projects operations with assumed new FERC license requirements and a future level of development upstream. Both the Near-Term and Future conditions include Camp Far West operations representative of how SSWD currently operates the Project, and include all current physical, regulatory and contractual constraints.

The Ops Model was validated by comparison with observed data from WY 1995 through 2014. This report includes comparison of simulated results and observed data for the entire simulation period for informational purposes. Recent years are used for validation because SSWD

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<sup>2</sup> Final Environmental Impact Statement 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.

operations have changed during the 39-year simulation period, most notably in 2000. For this reason a separate simulation was used for model validation. The validation model also includes limited water transfers that occurred during the validation period.

## 2.1.5 Existing Environmental Measures

### 2.1.5.1 Measures in Current FERC License

The initial license included 33 articles numbered 1 through 33 which has not changed since then. Of these, SSWD considers six articles (i.e., articles 24, 25, 26, 27, 28 and 32) “expired” or “out of date” because each pertains to a construction activity that has been completed, a filing related to a construction activity that has been completed, or another activity that has been completed. As a result, the existing license contains 27 “active” articles. The general topic that each of the 27 active articles is provided in Table 2.1-7.

**Table 2.1-7. List of active requirements in the existing FERC license for the Camp Far West Hydroelectric Project.**

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

Articles in the existing FERC Project license are shown below. Comments, including specifying any subsequent orders related to the article, are listed at the end of the article if the article has been modified from the initial Order Issuing License. Unless otherwise noted, the article was included in the Order Issuing License, and has not been amended. Articles SSWD considers out-of-date are noted. Primary FERC orders (i.e., an order that modified an existing license article) can be found on SSWD’s Relicensing Website ([www.sswdrelicensing.com](http://www.sswdrelicensing.com)) under the folder labeled “Initial License” and the subfolder labeled “FERC Orders.”

- Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

- Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, that if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.
- Article 3. The project works shall be constructed in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Upon the completion of the project, or at such other time as the Commission may direct, the Licensee shall submit to the Commission for approval revised exhibits insofar as necessary to show any divergence from or variations in the project area and project boundary as finally located or in the project works as actually constructed when compared with the area and boundary shown and the works described in the license or in the exhibits approved by the Commission, together with a statement in writing setting forth the reasons which in the opinion of the Licensee necessitated or justified variation in or divergence from the approved exhibits. Such revised exhibits shall, if and when approved by the Commission, be made a part of the license under the provisions of Article 2 hereof.

- Article 4. The construction, operation, and maintenance of the project and any work incidental to additions or alterations shall be subject to the inspection and supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of the project and for any subsequent alterations to the project. Construction of the project works or any features or alteration thereof shall not be initiated until the program of inspection for the project works or any such feature



thereof has been approved by said representative. The Licensee shall also furnish to said representative such further information as he may require concerning the construction, operation, and maintenance of the project, and of any alteration thereof, and shall notify him of the date upon which work will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow said representative and other officers or employees of the U.S., showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

- Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the U.S., necessary or appropriate for the construction, maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.
- Article 6. In the event the project is taken over by the U.S. upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a non-power licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: provided, that the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the U.S. or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

- Article 7. The actual legitimate original cost of the Project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.
- Article 8. The Licensee shall install and thereafter maintain gages and stream gaging stations for the purpose of determining the state and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character and locations of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.
- Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.
- Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.
- Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the U.S. on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the U.S. the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the U.S., the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.
- Article 12. The operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled

by such reasonable rules and regulations as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cfs, or such volume in acre-feet per specified period of time, as the Commission may prescribe for the purposes hereinbefore mentioned.

- Article 13. On the application of any person, association, corporation, federal agency, state or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.
- Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.
- Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.
- Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to

use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

- Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested federal or state agencies, after notice and opportunity for hearing.

*[On July 3, 1997, FERC issued an Order Revising Recreation Report. The license does not include any Exhibit R, recreation facility maps or a recreation facility plan.]*

- Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: provided, that the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.
- Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.
- Article 20. The Licensee shall consult with the appropriate state and federal agencies and, within one year of the date of issuance of this license, shall submit for Commission approval a plan for clearing the reservoir area. Further, the Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. Upon approval of the clearing plan all clearing of the lands and disposal of the unnecessary material shall be done with

due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate federal, state, and local statutes and regulations.

- Article 21. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of non-power facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.
- Article 22. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.
- Article 23. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.
- Article 24. Licensee shall submit, to the Director, Office of Electric Power Regulation, a report on the liquefaction potential of the dam foundation material within one year from the date of issuance of this order. If the dam is subject to failure by liquefaction of the foundation, Licensee shall submit for approval within two years from the date of this order, a plan and schedule to ensure the safety of the dam.

*[SSWD considers this article out-of-date since it pertains to initial Project construction, which has been completed.]*

- Article 25. Licensee shall commence construction of the project within two years from the effective date of the license and shall thereafter in good faith and with due diligence prosecute such construction and shall complete construction of such project works within four years from the effective date of the license.

*[SSWD considers this article out-of-date since it pertains to initial Project construction, which has been completed.]*

- Article 26. Licensee shall file with the Commission's Regional Engineer and Director, Office of Electric Power Regulation, one copy each of the contract drawings and

specifications for pertinent features of the project such as water retention structures, powerhouses, and water conveyance structures, 60 days prior to start of construction. The Director, Office of Electric Power Regulation may require changes in the plans and specifications to assure a safe and adequate project.

*[SSWD considers this article out-of-date since it pertains to initial Project construction, which has been completed.]*

- Article 27. Within one year from the date of commencement of operation of the project, the Licensee shall file for approval, revised "as-built" Exhibits F and G to show the project as finally constructed and located and conforming to §4.51 of the Commission's regulations.

*[SSWD considers this article out-of-date since it pertains to initial Project construction, which has been completed.]*

- Article 28. Prior to commencement of any construction or development of any project works or other facilities at the project, the Licensee shall consult and cooperate with the California State Historic Preservation Officer (SHPO) to determine the need for, and extent of, any archeological or historic resource surveys and any mitigative measures that may be necessary. The Licensee shall make available funds in a reasonable amount for any such work as required. If any previously unrecorded archeological or historic sites are discovered during the course of construction, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the Licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant archeological or historic resources. If the Licensee and the SHPO cannot agree on the amount of money to be expended on the project, the Commission reserves the right to require the Licensee to conduct, at its own expense, any such work found necessary.

*[SSWD considers this article out-of-date since it pertains to initial Project construction, which has been completed.]*

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

*[Amended in 46 FERC ¶62,088 Order Amending License issued on January 26, 1989 to read as shown above.]*

- Article 30. The Licensee shall during construction and operation of the project, consult with the California Department of Fish and Game, and the U.S. Fish and Wildlife Service of the Department of the Interior to ensure that any adverse impacts on fish and wildlife resources are minimized. Results of consultation with the above agencies on fish and

wildlife matters shall be filed with the Commission. The Commission reserves the right to require changes in the project works or operations that may be necessary to protect and enhance the environment.

- Article 31. The Licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued: (a) for the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 9,070 horsepower.
- Article 32. The Licensee shall retain a board of three or more qualified, engineering consultants (USBR could be accepted as the Board of Consultants for the purposes of this article) to review the design, specifications, and construction of the project for safety and adequacy. The names and qualifications of the board members shall be submitted to the Director, Office of Electric Power Regulation, for approval. Among other things, the Board shall assess the geology of the project site, with particular attention to any problems that may complicate the safe construction of the intake facilities and the tunnel passing under the existing dam. The Board shall assess the design, specifications and construction of the powerhouse, tunnel, intake works, electrical and mechanical equipment, the construction inspection program, construction procedures, and progress. The Licensee shall submit to the Commission copies of the Board's report on each meeting. The Licensee shall also submit a final report of the Board upon completion of the Project. The final report shall contain a statement by the Board indicating the Board's satisfaction with the construction, safety, and adequacy of the project structures.

*[SSWD considers this article out-of-date since it pertains to initial Project construction, which has been completed.]*

- Article 33. (A) In accordance with the provisions of this article, the Licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The Licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the Licensee shall also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the Licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the Licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(B) The types of use and occupancy of project lands and waters for which the Licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the Licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The Licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable State and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the Licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (B), the Licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the Licensee's costs of administering the permit program. The Commission reserves the right to require the Licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (B) and to require modifications of those standards, guidelines, or procedures.

(C) The Licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the Licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (C) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(D) The Licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7)



other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (D)(7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (D), the Licensee must file a letter to the Director, Office of Electric Power Regulations, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the Licensee to file an application for prior approval, the Licensee may convey the intended interest at the end of that period.

(E) The following additional conditions apply to any intended conveyance under paragraphs (C) or (D) of this article: (1) Before conveying the interest, the Licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer. (2) Before conveying the interest, the Licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value. (3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project. (4) The Commission reserves the right to require the Licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

## **2.1.5.2 Measures in Water Rights, Agreements and Contracts**

### **2.1.5.2.1 SSWD's Water Rights for Power (No Expiration Date)**

SSWD holds a post-1914 appropriative water right for the purposes of operating the Project for hydroelectric power generation. Table 2.1-8 provides SWRCB designations and the key terms of the post-1914 appropriative water-right permit held by SSWD for power use.

**Table 2.1-8. Water right permit held by SSWD for operation of the Camp Far West Hydroelectric Project for power generation.**

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

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

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

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

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

SSWD makes water deliveries from the Bear River and several small tributaries to its members within its service area consistent with SSWD’s consumptive use water rights. Table 2.1-9 lists SSWD’s post-1914 appropriative water-right licenses and permit for irrigation and domestic uses.

**Table 2.1-9. Water rights held by SSWD for delivery to SSWD’s members within its service area for irrigation and domestic uses.**

Priority (date)	SWRCB Designation (application)	SWRCB Designation (license)	Source (Waterbody)	Purpose of Use	Amount & Place of Diversion or Storage (amount & place)	Season (period)	Place of Beneficial Use
6/13/41	10221	11120	Bear River	Irrigation, Domestic and Incidental Power <sup>2</sup>	250 cfs Direct Diversion	from 3/1 – 6/30 and from 9/1 – 10/31	59,000 ac within SSWD and 4,180 ac within CFWID
					40,000 ac-ft Storage	from 10/1 – 6/30	
5/2/52 <sup>1</sup>	14804	11118	Bear River	Irrigation, Domestic and Incidental Power	330 cfs Direct Diversion	from 5/1 – 9/1	59,000 ac within SSWD and 4,180 ac within CFWID
					58,370 ac-ft Storage	from 10/1 – 6/30	
8/16/51	14430	4653	Coon Creek	Irrigation	2cfs Direct Diversion	from 4/1 – 11/1	80 ac
4/12/65	22102	11121	East Side Canal, Coon Creek, Markham Ravine, and Auburn Ravine	Irrigation	40.3 cfs Direct Diversion 4,769 AF per annum	from 4/1 – 6/1 and 9/1 – 10/31	4,000 ac

**Table 2.1-9. (continued)**

Priority (date)	SWRCB Designation (application)	SWRCB Designation (license)	Source (Waterbody)	Purpose of Use	Amount & Place of Diversion or Storage (amount & place)	Season (period)	Place of Beneficial Use
8/11/71	23838	12587	Yankee Slough	Irrigation	1.35 cfs Direct Diversion 143 AF per annum	from 4/1 – 6/1 and 9/1 – 9/30	235 ac

<sup>1</sup> SSWD received a release from priority from Applications 5633 and 5634 for Application 14804.

<sup>2</sup> Incidental Power is identified as a purpose of use for Applications 10221 and 14804. The powerhouse listed in the place of use for these applications is a hydroelectric facility located along SSWD’s main canal.

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

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

In February 2000, SSWD, DWR and the CFWID entered into the Bear Agreement (DWR, SSWD and CFWID 2000)<sup>3</sup> 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.

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-feet transferred to DWR during dry and critical years,<sup>[4]</sup> 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

<sup>3</sup> 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, February 2000.

<sup>4</sup> SWRCB Order 2000-10 states: “Dry and critical years are defined, for purposes of this order, as set forth on page 23 of the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Adopted by the SWRCB in May, 1995)*, except that such years do not include a year in which water storage in Camp Far West Reservoir on April 1 is at or below 33,255 acre-feet (“extreme critical year”).”

(i.e., SSWD installs notched boards on the diversion dam and controls the elevation of the diversion dam impoundment to provide the required flow).

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.

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

#### 2.1.5.2.3 Water Supply Contracts/Agreements and Water Transfers

### **Camp Far West Irrigation District**

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

### **Other**

In recent years, SSWD has participated in water transfers of water held in storage in Camp Far West Reservoir. Transfers occurred in 2008, 2009, 2010, and 2014. The volume of water transferred in 2008 was approximately 6,800 ac-ft. The transfer volume was approximately 10,000 ac-ft in each of the other three years. In each year, transfer water was released from Camp Far West Dam in the months of July, August, and September. Transfer water flowed over the non-Project diversion dam, down the Bear River, was conveyed across the Sacramento-San Joaquin River Delta, and was pumped out of the southern Delta at facilities owned and operated by the State Water Project. The decision on whether to participate in voluntary water transfers is made each year, when there are potential buyers, by the SSWD Board of Directors. It is unknown whether SSWD will participate in future water transfers.

#### **2.1.5.3 Current FERC License Project Maps, Design Drawings and Plans**

##### 2.1.5.3.1 Project Maps (Exhibit G)

Table 2.1-10 lists current FERC license Project maps that show the area within the existing FERC Project Boundary in conformance with 18 C.F.R. Section 4.39.

**Table 2.1-10. Lists of Project maps in existing license for the Camp Far West Hydroelectric Project.**

Exhibit G Map Number in Existing License	Date of Most Recent FERC Order Approving Map	FERC-Assigned Drawing Number	Project Map Name
G-1	2/23/04	2779-16	Project Boundary
G-2	6/19/90	2779-11	Project Boundary
G-3	6/19/90	2779-12	Project Boundary

Copies of Project maps are included in Appendix E of this PAD.

2.1.5.3.2 Project Design Drawings (Exhibit F)

Table 2.1-11 lists current FERC license design drawings of Project facilities in conformance to 18 C.F.R. Section 4.39. These drawings provide plan, elevation, profiles and sections in accordance with the requirements of 18 C.F.R. Section 4.41(g), and depict the as-built principal Project works. For ease of reference, YCWA lists the design drawings by their current exhibit number.

**Table 2.1-11. Lists of design drawings in existing license for the Camp Far West Hydroelectric Project.**

Exhibit F Design Drawing Number in Existing License	Date of Most Recent FERC Order Approving Design Drawing	FERC-Assigned Drawing Number	Design Drawing Name
F-1	2/23/04	2779-14	Existing and Proposed Facilities
F-2	6/21/99	2779-13	Powerhouse Plan and Sections
F-3	2/23/04	2779-15	Plans and Sections, Dike and Wing Dams

In accordance with Sections 5.30 and 4.32(k) of FERC’s regulations, and in light of heightened national security concerns, design drawings are treated by FERC as Critical Energy Infrastructure Information (CEII) under Section 388.112 of FERC’s regulations. Procedures for the public to obtain access to CEII from FERC may be found at 18 C.F.R. Section 388.113. Requests for access should be made to FERC’s CEII Coordinator.

2.1.5.3.3 FERC License Plans

Outside of the existing license but still under FERC’s jurisdiction, SSWD has developed and now maintains one plan related to the Project. This is:

- Camp Far West Hydroelectric Project Emergency Action Plan. This plan was prepared by SSWD at the direction of FERC’s Regional Engineer and filed with FERC. The plan describes the procedures SSWD and emergency response agencies would take in the event of imminent failure of Camp Far West Dam. The Emergency Action Plan is tested (i.e., tabletop and functional exercise) every 5 years with the last test in 2011.

## **2.1.6 Compliance History**

SSWD is in compliance with terms and conditions of the existing license. During annual FERC Project inspections and the 5-year public safety, environmental, and recreation inspections, various remedial actions are recommended as a result of the inspections. SSWD initiates actions and proposes plans and schedules for more significant actions to correct any issues of safety, compliance, or other issues as recommended from the inspections and provides written confirmation of the actions taken.

SSWD has had no re-occurring situations of non-compliance with the existing license's terms and conditions. In the event of a deviation from a term or condition in the existing license, such as deviation from a flow requirement, SSWD notifies FERC, initiates an investigation and provides a written report, including proposed corrective actions if appropriate, to FERC regarding the deviation. FERC conducts its own analysis and determines if the deviation is considered a formal non-compliance event. There have been no such events in the past 5 years.

As mentioned previously, as directed by FERC, SSWD is in the process of modifying the Camp Far West Dam spillway to safely pass the PMF without the dam overtopping.

## **2.1.7 Current Net Investment**

SSWD estimates the existing Project's net book value (assets minus liabilities) at this time (2015) is approximately \$14,343,578, with \$10,784,684 related to hydropower facilities, \$1,317,908 related to recreation facilities required by the FERC license, and \$2,240,096 related to land associated with the hydropower and recreation facilities.

## **2.2 Proposed Changes to the Existing Project**

At this time, SSWD proposes no changes to existing Project facilities or features, or existing Project operations with on exception. SSWD proposes to modify the existing FERC Project Boundary to remove lands surrounding the Camp Far West 60 kV transmission line. The transmission line, which was built and is owned and operated by PG&E, was originally included in the license application as part of the Camp Far West Hydroelectric Project. However, on April 2, 1991, with the consent of PG&E, the transmission line from the Camp Far West switchyard was removed from the Camp Far West Hydroelectric Project FERC license and added to PG&E's Camp Far West Transmission Line Project (FERC Project No. 10821). SSWD inadvertently did not amend the FERC Project Boundary at that time.

SSWD will continue to evaluate upgrades to the Project, including a potential 5-ft pool raise, and reserves its right to propose changes as the relicensing proceeds.

## **2.3 List of Attachments**

There are no attachments to this section.