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3.0 PROPOSED ACTION AND ALTERNATIVES

3.1 PROPOSED ACTION

The following is a description of the Proposed Action for relicensing four of the seven Big Creek Hydroelectric Projects that make up the Big Creek Hydroelectric System (BCS). These Projects are owned and operated by the Southern California Edison Company (SCE). Licensing of the four Projects was conducted using the Alternate Licensing Process (ALP). The Proposed Action includes requested license terms, and describes existing Project facilities, proposed Project boundaries, water management, and Project maintenance activities. Additionally, the Proposed Action includes a description of environmental measures, that will be used for the protection and enhancement of resources in the vicinity of the four Projects in the Upper San Joaquin River Basin (Basin).

3.1.1 License Term

The Proposed Action requests that the Commission issue an order for new license for each of the four Big Creek ALP Hydroelectric Projects with a term no less than 44 years from the date of license issuance for all four Projects. If the Commission Order Issuing New License for any of the four Projects occurs prior to new license issuance for the other three projects within the Big Creek ALP, the earliest license should have a longer term such that all licenses have an expiration date in 2053.

A 44-year license term is supported by: (1) the cost savings and improved analysis made possible by coordinating future relicensings of the entire BCS, (2) the significant cost to SCE in conducting the ALP and in implementing the proposed mitigation and enhancement measures, (3) the time and financial costs incurred by the agencies, stakeholders and licensee to complete the lengthy relicensing process and achieve a comprehensive settlement agreement, (4) the flexibility and long-term commitment contained within many of the proposed management plans, and (5) the availability of the Commission's standard license re-opener clauses, which enable reconsideration in the event that conditions change significantly from those analyzed in this document. Each of these issues is explored in greater detail within this document.

SCE is requesting that the Commission coordinate the future license expiration dates of all seven Big Creek Hydroelectric Projects. The requested license terms for the four ALP Projects would allow for future coordination of the licensing efforts associated with all seven Big Creek Projects. The Commission issued a new 36-year license for the Big Creek No. 4 Hydroelectric Project (FERC No. 2017) on December 4, 2003, with a license expiration of December 1, 2039, and SCE has outstanding license applications associated with the Portal Project (FERC No. 2174) and Vermilion Valley Project (FERC No. 2086). If the Commission were to issue new licenses for the four ALP Projects within the two-year time frame provided for processing each license application, then the Commission could also coordinate the future expiration dates of the Portal, and Vermilion licenses (expiration date of December 1, 2053).

For the Big Creek No. 4 Project, the Commission has the authority to extend that license term another 14 years to reach a 50-year license term. Upon receipt of the requested license terms for the four ALP Projects, SCE will file an amendment request for the Big Creek No. 4 license to extend the license term to be co-terminus with the ALP Projects. SCE requests that the Commission issue the new licenses for the Portal and Vermilion Projects at the same time as the Big Creek ALP Project licenses are issued.

Commission policy is to allow for the issuance of 50-year license terms for projects with extensive mitigation and enhancement measures, and other activities, including significant new infrastructure improvements. The Proposed Action includes an extensive suite of mitigation and enhancement measures, e.g., significant increases in instream and channel riparian maintenance flows, as well as substantial recreation and transportation system enhancements. The Proposed Action also includes significant construction of new and modified water release facilities on diversion dams, new stream gages, and installation of new equipment to monitor instream flows. This amount of mitigation and enhancement justifies the Commission's issuance of a 50-year license. However, SCE is requesting 44-year license terms for the four Big Creek ALP Projects so that the Commission may coordinate the license terms with the other BCS licenses.

The requested license terms would allow time for SCE to recover the significant costs associated with this relicensing proceeding and the new license conditions. The annualized cost (2006$) of implementing new environmental measures for the four Big Creek ALP Projects over the recommended term of new licenses is $5,247,251 (Section 7.1.2). Additionally, the mitigation measures proposed by SCE would result in an overall annual loss of generation of approximately 1.87 GWh, with an estimated annual replacement energy cost (2006$) of $9,924,000 (Table 7.1-1). A total annual cost of about $15,171,251 justifies the requested license expiration date of 2053.

A coordinated expiration date will simplify future licensing efforts by allowing all stakeholders to participate in one process, instead of many different license proceedings. Many of the same stakeholders that were involved in the Big Creek ALP were also involved in the Big Creek No. 4, Vermilion, and Portal relicensing processes. Developing all the license applications at once would be an efficient and cost effective undertaking, because all seven Big Creek System Projects are located within the same watershed and are owned and operated by SCE.

Therefore, SCE proposes that the Commission issue new licenses for Mammoth Pool (FERC Project No. 2085); Big Creek Nos. 1 and 2 (FERC Project No. 2175); Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67); and Big Creek No. 3 (FERC Project No. 120) projects with license expirations of 2053.

3.1.2 Project Facilities to be Licensed

The major components of the four Big Creek ALP Projects include powerhouses, dams and diversions, reservoirs, forebays, water conveyance systems; and transmission lines. A brief description of the major components of each Project is provided in the

following section. A complete list of Project components, including Project roads and trails, and ancillary Project facilities is provided in Tables 3.1.2-1 through 3.1.2-3.

Detailed descriptions of the Project components (including dam construction and dimensions; flow capacities of spillways, diversions and water conveyance systems; storage capacities of reservoirs, lakes, and forebays; and characteristics of outlets works, penstocks, gate valves, and generation units) are provided in Exhibit A of the Application for New License, Volume 1 for each of the four Big Creek ALP Projects, and also are provided in the Initial Information Package (IIP) for the Big Creek Hydroelectric System, Alternative Licensing Process (SCE 2000; Volume 4, SD-A (Books 6 and 21)). A summary of the physical hydraulic capacities of flow release and diversion structures at Project dams and diversions is provided in Table 3.1.2-4. The Transportation System Management Plan contains a detailed list and description of Project roads and trails (SCE 2007a; Volume 4, SD-G (Books 19 and 24)).

3.1.2.1 Mammoth Pool (FERC Project No. 2085)

The Mammoth Pool Project operates under a Commission license as Project No. 2085, originally issued on December 30, 1957, which expires on November 30, 2007. The Project has a dependable operating capacity of approximately 187 megawatts (MW). The existing major Project components consist of:

- One powerhouse and one fishwater generator:
  - Mammoth Pool Powerhouse, containing two turbine generator units, with a total dependable operating capacity of approximately 187 MW.
  - One fishwater generator at the base of Mammoth Pool Dam, with a generation capacity of 937 kilowatt (kW).
- One large dam:
  - Mammoth Pool Dam, forming Mammoth Pool Reservoir, with a usable storage capacity of approximately 119,940 acre-feet (ac-ft) at an elevation of approximately 3,330 feet (ft) above mean sea level (msl).
- Two water conveyance systems:
  - Mammoth Pool Power Tunnel, which is used to convey water from Mammoth Pool Reservoir to the penstock at Mammoth Pool Powerhouse. The water conveyance system is approximately 7.5 miles long. Water from Rock and Ross Creek diversions also enter into the Mammoth Pool Power Tunnel between the reservoir and powerhouse.
  - Mammoth Pool Diversion Tunnel is used to convey water from Mammoth Pool Reservoir to the Fishwater generator, Howell-Bunger (HB) valve at the dam, and minimum instream flow (MIF) release valve at Mammoth Pool Dam. This water

conveyance system is approximately 2,092 ft long and begins at its intake in the Mammoth Pool Reservoir.

- Two small diversions, which contribute to the Mammoth Pool Power Tunnel, including:
  - Rock Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 3,336 ft above msl.
  - Ross Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 3,359 ft above msl.
- One transmission line:
  - The Mammoth Pool Powerhouse–Big Creek 3 Transmission Line is approximately 6.7 miles long and connects the Mammoth Pool Powerhouse to the Big Creek No. 3 Switchyard. The line is a 230 kW/V, 3-phase single circuit line.

3.1.2.2 Big Creek Nos. 1 and 2 (FERC Project No. 2175)

The Big Creek Nos. 1 and 2 Project operates under Commission license as Project No. 2175. This license was issued on March 27, 1959, and expires on February 28, 2009. The Project has a dependable operating capacity of approximately 150 MW. The existing major Project components consist of:

- Two powerhouses:
  - Powerhouse No. 1, with four turbine/generator units and a total dependable operating capacity of approximately 82.9 MW.
  - Powerhouse No. 2, with four turbine/generator units and a total dependable operating capacity of approximately 67.1 MW.
- Four dams that impound one reservoir:
  - Dams 1, 2, 3, and 3a, which form Huntington Lake, with a capacity of approximately 89,166 ac-ft, at an elevation of approximately 6,950 ft above msl.
- One moderate-sized dam:
  - Dam 4, which forms Dam 4 Impoundment (Powerhouse 2 Forebay), with a capacity of approximately 60 ac-ft, at an elevation of approximately 4,810 ft above msl.

- Three small diversions:
  - Balsam Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 4,880 ft above msl.
  - Ely Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 4,844 ft above msl.
  - Adit 8 Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 4,825 ft above msl.
- Three water conveyance systems:
  - Tunnel No. 1, used to convey water from Huntington Lake to Big Creek Powerhouse No. 1. Water is conveyed through Tunnel No. 1 and an 84-inch diameter pipe approximately 2 miles to the top of the penstocks leading into Big Creek Powerhouse No. 1.
  - Tunnel No. 2, used to convey water from the Dam 4 Impoundment just downstream of Powerhouse 1 to Big Creek Powerhouse No. 2. Tunnel No. 2 is approximately 4.1 miles long. Water from Ely and Balsam Creek diversions also enter into Tunnel No. 2 between the forebay and powerhouse.
  - The Shoo Fly, used to convey water from Shaver Lake (FERC Project No. 67) through Tunnel 5 and into Tunnel 2 leading to Powerhouse No. 2. The conveyance system consists of a bulkhead in Tunnel No. 5 with a pipe leading downhill to a valve and energy dissipation structure just above Adit 8 Diversion. The Shoo fly was used during the construction of Shaver Lake Dam and Powerhouse No. 2A to keep water off the dam and to get more generation from Powerhouse No. 2. Upon completion of Shaver Dam and Powerhouse No. 2A, the Shoo fly Complex was no longer used. Although not currently in use, the Shoo fly Complex gives SCE the flexibility to divert water from Shaver Lake to Powerhouse No. 2, if required.

3.1.2.3 Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67)

The Big Creek Nos. 2A, 8, and Eastwood Project operates under a Commission license as Project No. 67. This license was issued on August 9, 1978, and expires on February 28, 2009. The Project has a dependable operating capacity of approximately 370 MW. The existing major Project components consist of:

- Two powerhouses and an underground power station:
  - Big Creek Powerhouse No. 2A, with two turbine/generator units and a total dependable operating capacity of approximately 98.5 MW.
  - Powerhouse No. 8, with two turbine/generator units and a dependable operating capacity of approximately 64.5 MW.

  - Eastwood Power Station, with one turbine/pump/generator unit and a dependable operating capacity of approximately 207 MW.

- Two major dams and reservoirs:
  - Shaver Dam, forming Shaver Lake, which has a usable storage capacity of approximately 135,568 ac-ft, at an elevation of approximately 5,370 ft above msl.
  - Florence Dam, forming Florence Lake, which has a usable storage capacity of approximately 64,406 ac-ft, at an elevation of approximately 7,327 ft above msl.
- Five moderate-sized dams forming two forebays and three small diversion pools:
  - Balsam Forebay, with a usable storage capacity of approximately 1,547 ac-ft, at an elevation of approximately 6,670 ft above msl.
  - Dam 5 Impoundment (Powerhouse 8 Forebay), with a usable storage capacity of 49 ac-ft, at an elevation of approximately 2,943 ft above msl.
  - Pitman Diversion Pool, with a usable capacity of approximately 1 ac-ft, at an elevation of approximately 6,900 ft above msl.
  - Bear Diversion Pool, with a usable capacity of approximately 103 ac-ft, at an elevation of approximately 7,350 ft above msl.
  - Mono Diversion Pool, with a usable capacity of approximately 47 ac-ft, at an elevation of approximately 7,350 ft above msl.
- Eight small diversions:
  - Hooper Creek Diversion, with a usable capacity of approximately 3 ac-ft, at an elevation of approximately 7,505 ft above msl.
  - Bolsillo Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 7,535 ft above msl.
  - Chinquapin Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 7,629 ft above msl.
  - Camp 62 Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 7,307 ft above msl.

Under the Proposed Action, four existing small diversions and associated ancillary features are proposed for decommissioning, including

  - North Slide Creek Diversion, (currently out of service) with a prior capacity of less than 1 ac-ft, at an elevation of approximately 7,501 ft above msl.

- South Slide Creek Diversion, (currently out of service) with a prior capacity of less than 1 ac-ft, at an elevation of approximately 7,501 ft above msl.

- Tombstone Creek Diversion, (currently out of service) with a prior capacity of less than 1 ac-ft, at an elevation of approximately 7,673 ft above msl.

- Crater Creek Diversion, with a usable capacity of less than 1 ac-ft, at an elevation of approximately 8,764 ft above msl.

The North Slide Creek, South Slide Creek, and Tombstone Creek diversions are currently out of service.

- Six water conveyance systems including:

  - Ward Tunnel, which conveys water from Florence Lake to Huntington Lake (Huntington Lake is a component of FERC Project No. 2175) and has a conveyance capacity of approximately 1,760 cubic feet per second (cfs). The tunnel is approximately 12.8 miles long and receives water from Florence Lake, Mono Creek, Bear Creek, the small tributaries discussed above, and the East and West Forks of Camp 61 Creek (via Portal Forebay, a component of the Portal Project, (FERC Project No. 2174).

  - Mono-Bear Siphon, which conveys water from the Mono and Bear diversions to Ward Tunnel. Water is conveyed from Mono Diversion through approximately 1.6 miles of flowline, and from Bear Creek Diversion through approximately 1.4 miles of combined tunnel and flowline to where the two tunnels connect, known as the Mono-Bear Wye. From this point, water is conveyed another 2.6 miles through a combined flowline/siphon to Ward Tunnel. The Mono Tunnel and Bear Tunnel have conveyance capacities of 450 cfs each, respectively. The combined flowline/siphon has a conveyance capacity of approximately 650 cfs.

  - Huntington-Pitman-Shaver Conduit, also known as Tunnel No. 7, conveys water from Huntington Lake and the Pitman Creek Diversion to Shaver Lake through either North Fork Stevenson Creek or through Balsam Forebay and the Eastwood Power Station. Tunnel No. 7 is approximately 5.4 miles long and terminates at Gate No. 2 tunnel outlet located on North Fork Stevenson Creek upstream of Shaver Lake. The Balsam Diversion Tunnel is approximately 1.1 miles long and branches off Tunnel No. 7 approximately 1,200 ft upstream of the Gate No. 2 outlet, connecting to Balsam Forebay. Water is normally routed to Balsam Forebay from Tunnel No. 7 through the Balsam Diversion Tunnel (except for MIF releases to North Fork Stevenson Creek, and when Project repair or maintenance closes either Balsam Meadows Forebay or the Eastwood Powerstation and water must be moved into Shaver Lake).

  - Eastwood Power Station and Tailrace Tunnels, which convey water from Balsam Forebay through the Eastwood Power Station to Shaver Lake. The Eastwood Power Station Tunnel is about 1 mile long. The Tailrace Tunnel is about 1.4

miles long. The conveyance capacity of the tunnels is approximately 2,500 cfs. The Eastwood Power Station, power tunnels and the tailrace also are used to convey water back from Shaver Lake to Balsam Forebay during pumpback operations.

  - Tunnel No. 5, which conveys water from Shaver Lake to Big Creek Powerhouse No. 2A and has a conveyance capacity of approximately 650 cfs. The tunnel is about 2.6 miles long.

  - Tunnel No. 8, which conveys water from the Dam No. 5 Impoundment just downstream of Powerhouse 2/2A to Powerhouse No. 8, has a conveyance capacity of approximately 1,173 cfs. The tunnel is about 1 mile long.

- One transmission line:

  - Eastwood Power Station–Big Creek 1 Transmission Line, which connects Eastwood Power Station to a non-Project switchyard at Big Creek Powerhouse No. 1. This transmission line is approximately 4.7 miles long, and is a 220kV line.

3.1.2.4 Big Creek No. 3 (FERC Project No. 120)

The Big Creek No. 3 Project operates under a Commission license as Project No. 120, issued on September 7, 1977, which expires on February 28, 2009. The Project has a dependable operating capacity of approximately 182 MW. The major existing Project components consist of:

- One powerhouse:

  - Big Creek Powerhouse No. 3, with five turbine generator units.

- One moderate-sized dam and forebay (Dam 6 Impoundment):

  - Dam 6 impoundment, with a capacity of approximately 993 ac-ft, at an elevation of approximately 2,230 ft above msl.

- One water conveyance system:

  - Powerhouse No. 3 water conveyance system conveys water from Dam No. 6 Impoundment to Big Creek Powerhouse No. 3. The conveyance system is primarily tunnel, approximately 5.3 miles long, with a capacity of approximately 3,250 cfs. It also includes a pressure-relief valve system and penstocks providing pressurized water from the tunnel to the turbines.

3.1.3 Project Boundaries

SCE is proposing several modifications to the existing Project boundaries at all four Big Creek ALP Projects as described in the following sections.

3.1.3.1 Mammoth Pool (FERC Project No. 2085)

Areas Proposed for Inclusion in the Project Boundary

- Shakeflat Creek Trail, access to San Joaquin River gaging station upstream of Shakeflat Creek

  The Shakeflat Creek Trail is proposed to be added to the Project Boundary. SCE uses this trail to access and maintain the gaging station located on the San Joaquin River upstream of the Shakeflat Creek confluence. The trail originates at the crossing of U.S. Department of Agriculture Forest Service (USDA-FS) Road No. 7S20 over Shakeflat Creek and follows the left bank of Shakeflat Creek to the confluence with the San Joaquin River where the trail then continues upstream to the river gaging station. The length of the trail is 3,112 ft and the Project Boundary should include a 10 ft right-of-way (ROW) from the centerline (5 ft from the centerline on each side of the trail). This Project Boundary modification will result in the addition of approximately 0.7 acres of federal land (Figure 3.1.3-1).

- Helicopter landing site adjacent to the San Joaquin River above Shakeflat Creek

  The helicopter landing site adjacent to the San Joaquin River above Shakeflat Creek is proposed to be added to the Project Boundary. SCE uses this landing site to access a trail leading to the stream gage (SCE gage No. 157) located on the San Joaquin River. The landing site provides access to the gage and is needed for the operation and maintenance of the Project. The landing site is located within a circular area 400 feet in diameter. This Project Boundary modification will result in the addition of approximately 2.90 acres of federal land (Figure 3.1.3-1).

3.1.3.2 Big Creek Nos. 1 and 2 (FERC Project No. 2175)

Areas Proposed for Removal from the Existing Project Boundary

- Rancheria Creek downstream of Portal Powerhouse (Portal Tailrace) to the high water line of Huntington Lake

  Rancheria Creek from Portal Powerhouse to the high water line of Huntington Lake is proposed to be removed from the Project Boundary. This reach is primarily affected by flow through the Ward Tunnel and is currently included in the Project boundaries of two other FERC licensed projects (Big Creek Nos. 2A, 8, and Eastwood, FERC Project No. 67; and Portal Project, FERC Project No. 2174). Commission staff were consulted and concur with SCE's recommendation that this reach be removed from the Portal Project (FERC 2005). Removal of this reach from the Big Creek Nos. 1 and 2 Project (FERC Project No. 2175) would be consistent with the action proposed for the Portal Project. The reach does not need to be included within more than one FERC license, but should still be included as part of the Big Creek Nos. 2A, 8, and Eastwood Project, as it is the primary conveyance for water from the back-country diversions, which are largely part of Project No. 67, into

the Big Creek System. This Project Boundary modification will result in the removal of approximately 2.51 acres of federal land from the Project Boundary (Figure 3.1.3-2).

- A portion of the ROW along the access road to the gaging station located on Big Creek below Huntington Lake (USDA-FS Road Nos. 8S66 and 8S66A)

  The Project Boundary is proposed to be modified to align with the road and reduce the ROW width from 100 ft to 50 ft along the access route to the gaging station located on Big Creek below Huntington Lake. The access route is along two road segments as follows: (1) USDA-FS Road No. 8S66 from near the east end of Dam 2 to the intersection with USDA-FS Road No. 8S66A; and (2) USDA-FS Road No. 8S66A from USDA-FS Road No. 8S66 to the gaging station. The existing Project Boundary along these routes is a 100 ft wide ROW. The ROW should be reduced in width to 50 ft (25 ft from the centerline along both sides of the road). The additional land included in the 100 ft ROW is excessive and is not necessary for the safe and efficient operation of the Project. This Project Boundary modification will result in the removal of approximately 1.58 acres of federal land (Figure 3.1.3-3).

- A communication line ROW from the dispatchers office near Big Creek Powerhouse No. 3 to Big Creek Powerhouse No. 2 and the Northern Hydro offices near Big Creek Powerhouse No. 1

  The Project Boundary is proposed to be modified to remove this ROW along the former communication line that provided service from the dispatcher's office near Big Creek Powerhouse No. 3 to Big Creek Powerhouse No. 2 and the Northern Hydro offices near Big Creek Powerhouse No. 1. The communication line and associated equipment have been removed, after consultation with the USDA-FS, and the land is not necessary for the safe and efficient operation of the Project. Communication between the Project facilities is currently conducted via microwave transmission or by fiber optic cable. This Project Boundary modification will result in the removal of approximately 68.83 acres of federal land (Figures 3.1.3-4 and 3.1.3-5).

- Former company housing area near Big Creek Powerhouse No. 2 and 2A

  The former company housing area located across the creek from Big Creek Powerhouse No. 2 is proposed to be removed from the Project Boundary. The housing has been removed and the land restored after consultation with the USDA-FS. SCE does not require any access to these lands for the operation of the Project. This Project Boundary modification will result in the removal of approximately 10.52 acres of federal land (Figure 3.1.3-4).

- USDA-FS Road No. 8S13 from the gate located near the top of Big Creek Powerhouse No. 2 penstocks to USDA-FS Road No. 8S08.

  The segment of USDA-FS Road No. 8S13 located between the gate near the top of the penstocks for Big Creek Powerhouse No. 2/2A to USDA-FS Road No. S8S08

(Railroad Grade Road) is proposed to be removed from the existing Project Boundary. SCE does not need or use this road segment for the operation and maintenance of the Project. Access to Project facilities at this location is now provided by the Canyon Road (USDA-FS Road No. 8S05). This Project Boundary modification will result in the removal of approximately 28.23 acres of federal land (Figure 3.1.3-5).

- Excess land located southwest of Big Creek Powerhouse No. 2/2A

  Unused lands located southwest of Big Creek Powerhouse No. 2/2A is proposed to be removed from the current Project Boundary. This area of land was formerly occupied by SCE for company housing. The housing has been removed and the land restored after consultation with the USDA-FS. SCE does not require any access to these lands, and they are not necessary for the safe and efficient operation and maintenance of the Project, nor for other Project purposes. This Project Boundary modification will result in the removal of approximately 15.67 acres of federal land (Figure 3.1.3-5).

Areas Proposed for Inclusion in the Project Boundary

- Eastwood Overflow Campground

  The overflow camping area is proposed to be included in the Project Boundary for Big Creek Nos. 1 and 2 Project (FERC Project No. 2175) and removed from the Big Creek Nos. 2A, 8, and Eastwood Project (FERC Project No. 67). The overflow campground is used as a designated USDA-FS dispersed camping area when the developed campgrounds at nearby Huntington Lake are full. The Eastwood Overflow Campground does not need to be included in more than one FERC license, and is more closely associated with recreational use at Huntington Lake, a primary feature of the Big Creek Nos. 1 and 2 Project (FERC Project No. 2175). This Project Boundary modification will result in the addition of approximately 5.63 acres of federal land to the Project Boundary (Figure 3.1.3-2).

- Eastwood Overlook

  The Eastwood Overlook is proposed to be included in the Project Boundary for Big Creek Nos. 1 and 2 Project (FERC Project No. 2175). The overlook is located along Rancheria Creek upstream of the confluence with Huntington Lake, and is more closely associated with recreational use at Huntington Lake. This Project Boundary modification will result in the addition of approximately 0.48 acres of federal land (Figure 3.1.3-2).

- USDA-FS Road No. 8S66, from the gate to the west end of Dam 2

  The access road from the gate at the terminus of Fresno County Road 3380 (Huntington Lodge Road) to the west end of Dam 2 is proposed to be added to the FERC Project Boundary. This road is used by SCE to access Project facilities at

Dam 1 and Dam 2. This Project Boundary modification will not increase Federal use land fees because the lands are owned by SCE (Figure 3.1.3-3).

- Segment of USDA-FS Road No. 8S83

  A short segment of USDA-FS Road No. 8S83 from the junction with USDA-FS Road No. 8S83A is located outside of the Project Boundary on USDA-FS lands and is proposed to be added to the FERC Project Boundary, with a total width of ROW of 50 ft. This road is used by SCE to access the Project facilities in the vicinity of Dam 1 and Dam 2. This Project Boundary modification will result in the addition of approximately 2.6 acres of federal land (Figure 3.1.3-3).

3.1.3.3 Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67)

Areas Proposed for Removal from the Existing Project Boundary

- Excess land located southwest of Big Creek Powerhouse No. 2 and 2A

  Unused lands located southwest of Big Creek Powerhouse No. 2/2A are proposed to be removed from the Project Boundary. These lands were formerly occupied by SCE company housing, which has been removed and the land restored after consultation with the USDA-FS. SCE does not require any access to these lands, and it is not necessary that these lands be included in the Project Boundary for the safe and efficient operation and maintenance of the Project, nor for other specified Project purposes. This Project Boundary modification will result in the removal of approximately 16.48 acres of federal land (Figure 3.1.3-6).

- Excess land located along the southern side of Rancheria Creek from approximately 500 ft upstream of Portal Powerhouse downstream to Huntington Lake

  Unused lands along the south side of Rancheria Creek from approximately 500 ft upstream of Portal Powerhouse downstream to Huntington Lake are proposed to be removed from the Project Boundary. The lands proposed for removal from the Project Boundary are not necessary for the safe and efficient operation and maintenance of the Project, or for other specified Project purposes. SCE does not require any access to these lands for the operation of the Project. This Project Boundary modification will result in the removal of approximately 12.53 acres of federal land (Figure 3.1.3-7).

- Eastwood Overflow Campground

  The Eastwood Overflow Campground is proposed to be removed from the Project Boundary of the Big Creek Nos. 2A, 8, and Eastwood Project (FERC Project No. 67). The overflow campground is a designated USDA-FS dispersed camping area. This USDA-FS facility is not related to FERC Project No. 67 in any fashion. This Project Boundary modification will result in the removal of approximately 7.72 acres of federal land from the FERC No. 67 Project Boundary (Figure 3.1.3-7).

- Eastwood Overlook

  The Eastwood Overlook is proposed to be removed from the Project Boundary for Big Creek Nos. 2A, 8, and Eastwood Project (FERC Project No. 67). The overlook is located along Rancheria Creek, upstream of the confluence with Huntington Lake. This Project Boundary modification will result in the removal of approximately 0.48 acres of federal land (Figure 3.1.3-7).

- USDA-FS Road No 5580H Access road to Bolsillo Creek Diversion, from USDA-FS Road No. 5S80

  The access road to the Bolsillo Creek Diversion is proposed to be removed from the FERC Project Boundary. This public open-access USDA-FS Road No. 5S80 also provides access to the USDA-FS Bolsillo Campground, a USDA-FS horse corral, and to the Corbett Lake Trailhead. This road is not used exclusively by SCE for the operation and maintenance of the Project and should not be considered a Project road. This Project Boundary modification will result in the removal of approximately 1.41 acres of federal land (Figure 3.1.3-8).

- Chinquapin Diversion piping near Camp 62 along co-aligned segment of USDA-FS Road No. 7S01

  The Chinquapin Diversion Piping and co-aligned segment of USDA-FS Road No. 7S01 is proposed to be removed from the Project Boundary. The Chinquapin Diversion was relocated in 2002 and the associated steel diversion piping alongside of USDA-FS Road No. 7S01 was removed at that time. The lands associated with the former diversion piping are not necessary for the operation of the Project, nor other specified Project purposes. This Project Boundary modification will result in the removal of approximately 11.36 acres of federal land (Figure 3.1.3-8).

- Segment of USDA-FS Road No. 9S311, access road to Eastwood Power Station Switchyard

  USDA-FS Road No. 9S311 from Highway 168 to the Eastwood Power Station Switchyard is proposed to be removed from the Project Boundary. This road segment is not necessary for maintenance and operation of the Project, nor any other Project purpose. Access to the Eastwood Power Station Switchyard is provided by another road, USDA-FS Road No. 9S312. This Project Boundary modification will result in the removal of approximately 0.69 acres of federal land (Figure 3.1.3-9).

- Florence Lake Day-Use Area

  The Florence Lake Day-Use area is proposed to be removed from the FERC Project Boundary. The day-use area is located near the Crater Creek Diversion Channel that flows into the northwest corner of Florence Lake. This land is used exclusively for public recreation and is not needed for the operation of the Project. This Project

Boundary modification will result in the removal of approximately 13.66 acres of Federal land (Figure 3.1.3-17).

Areas Proposed for Inclusion in the Project Boundary

- USDA-FS Road No. 8S08A, access road to the upper penstock valves for Tunnel 5 from USDA-FS Road No. 8S08 (Railroad Grade Road)

  The portion of the access road leading to the upper penstock valves for Tunnel 5 (USDA-FS Road No. 8S08A) from the Railroad Grade Road (USDA-FS Road No. 8S08) is proposed to be added to the Project Boundary. SCE uses this road to access the area at the top of the penstocks for Big Creek Powerhouse No. 2 and 2A. SCE's use of this road segment is currently authorized under a Special Use Authorization (SUA) issued by the USDA-FS. The road should be considered a Project road that is needed for the operation and maintenance of the Project. The road is closed to public vehicular access by an SCE locked gate. This Project Boundary modification will result in the addition of approximately 0.5 acres of federal land (Figure 3.1.3-6).

- Bolsillo Creek Diversion and Stream Gage Trail

  The Bolsillo Creek Diversion and Stream Gage Trail is proposed to be added to the Project Boundary. SCE uses this trail to access and maintain the small diversion and gaging station on Bolsillo Creek. The trail originates from the Bolsillo Creek Diversion Access Road, USDA-FS Road No. 5S80H, which is a spur road off Kaiser Pass Road and terminates at the Bolsillo Creek Diversion. SCE maintains the trail and is the primary user. The length of the trail is approximately 285 ft and the Project Boundary should include a 10 ft ROW (5 ft from the centerline on each side of the trail). This Project Boundary modification will result in the addition of approximately 0.09 acres of federal land (Figure 3.1.3-8).

- Chinquapin Creek Diversion and Stream Gage Trail

  The Chinquapin Creek Diversion and Stream Gage Trail is proposed to be added to the Project Boundary. SCE uses this trail to access and maintain the small diversion and gaging station on Chinquapin Creek. The trail originates off the Florence Lake Road (USDA-FS Road No. 7S01) approximately a quarter mile beyond the intersection with Kaiser Pass Road (USDA-FS Road No. 5S80) and terminates at the Chinquapin Creek Diversion. SCE maintains the trail and is the primary user. The length of the trail is 3,854 ft and the Project Boundary will include a 10 ft ROW (5 ft from the centerline on each side of the trail). This Project Boundary modification will result in the addition of approximately 0.87 acres of federal land (Figure 3.1.3-8).

- USDA-FS Road No. 9S17 access road to Eastwood Power Station-Big Creek 1 Transmission Line tower M0 T3

  This access road, originally used during construction of the Eastwood Power Station-Big Creek No. 1 Transmission Line tower No. M0-T3, will be re-constructed and is proposed to be added to the Project Boundary. The road will be approximately 350 ft long and begins on State Highway 168 and terminates at tower No. MO-T3, with a 50 ft ROW (25 ft from the centerline along both sides of the road). This road is necessary for SCE to operate and maintain the transmission line tower. Portions of this access road are within the current Project Boundary around the transmission line. The proposed boundary modifications will only add those portions of the road not already in the existing FERC Boundary. This Project Boundary modification will result in the addition of approximately 0.23 acres of land (Figure 3.1.3-9).

- USDA-FS Road No. 9S312, access road to Eastwood Power Station Switchyard

  The access road to Eastwood Power Station Switchyard (USDA-FS Road No. 9S312) is proposed to be added to the Project Boundary. USDA-FS Road No. 9S312 provides SCE access to the Eastwood Power Station Switchyard from Highway 168. The road is closed to public vehicular traffic by an SCE locked gate. SCE uses the road to access the switchyard. SCE needs this road for operation and maintenance of the Project. This Project Boundary modification will include a 50 ft ROW (25 ft from the centerline along both sides of the road), and will result in the addition of approximately 0.76 acres of federal land (Figure 3.1.3-9).

- Gaging station on South Fork San Joaquin River above Hooper Creek confluence (SCE gage No. 128S)

  The gaging station and ancillary equipment (cable way and housing structure) on the South Fork San Joaquin River above the Hooper Creek confluence is proposed to be added to the Project Boundary. SCE's use of the land surrounding this gage is currently authorized under a SUA issued by the USDA-FS. This stream gage is used to measure flow in the South Fork San Joaquin River above the confluence with Hooper Creek. This gage should be added to the Project Boundary, with a 300 foot wide square around the gage and ancillary equipment. This Project Boundary modification will result in the addition of approximately 2.07 acres of federal land (Figure 3.1.3-10).

- Segment of USDA-FS Road No. 8S83 from the current FERC Project Boundary for Project No. 2175 to the Huntington-Pitman-Shaver Siphon

  The segment of USDA-FS Road No. 8S83, which is used by SCE to access the Huntington-Pitman-Shaver Siphon from the junction of USDA-FS Road No. 8S83A, is proposed to be added to the Project Boundary. The road is necessary for the operation and maintenance of the Project. The road is closed to public vehicular access by an SCE locked gate. This road is proposed to be added to the Project

Boundary with a 50 ft ROW (25 ft from the centerline along both sides of the road). This Project Boundary modification will result in the addition of approximately 4.11 acres of federal land (Figure 3.1.3-11).

- USDA-FS Road No. 8S94, Pitman Creek Diversion access road

  The Pitman Creek Diversion access road, USDA-FS Road No. 8S94, is proposed to be added to the Project Boundary. The road is necessary for the operation and maintenance of the Project. The road is closed to public vehicular access by an SCE locked gate. This road should be added to the Project Boundary with a 50 ft ROW (25 ft from the centerline along both sides of the road). This Project Boundary modification will result in the addition of approximately 1.76 acres of federal land (Figure 3.1.3-11).

- USDA-FS Road No. 9S32C, access road to the Eastwood Power Station-Big Creek No. 1 Transmission Line

  The Project Boundary is proposed to be modified by adding USDA-FS Road No. 9S32C and associated spur roads that provide access to the Eastwood Power Station-Big Creek No. 1 Transmission Line towers (Nos. M1-T2, M1-T3, M1-T4, M1-T5, M1-T6, M2-T1 and M2-T2). The total length of road and associated spurs to be added to the Project Boundary is 2.12 miles. The area to be included in the Project Boundary along the road and associated spurs includes a 50 ft ROW (25 ft from the centerline along both sides of the road) at locations where the road is not already within the FERC Boundary around the existing transmission line. SCE needs this road and associated spurs for maintenance and inspection of the Eastwood Power Station-Big Creek No. 1 Transmission Line. This Project Boundary modification will not increase Federal use land fees because the lands are owned by SCE (Figure 3.1.3-12).

- USDA-FS Road No. 8S47, access to the Eastwood Power Station-Big Creek 1 Transmission Line

  The Project Boundary is proposed to be modified to cover re-constructing 0.62 miles of road from the terminus of USDA-FS Road No. 8S47, which will provide access to the Eastwood Power Station-Big Creek No. 1 Transmission Line tower Nos. M3-T1, and M2-T5. This road segment was used during the original construction of the Transmission Line and was subsequently decommissioned. The area to be added to the Project Boundary includes a 50 ft ROW (25 ft from the centerline along both sides of the road). SCE needs this road for maintenance and inspection of the transmission line. This Project Boundary modification will result in the addition of approximately 3.11 acres of federal land (Figure 3.1.3-12).

- USDA-FS Road Nos. 8S02 and 8S02B, access road to the Huntington-Pitman-Shaver Tunnel Adit

  The access roads to the Huntington-Pitman-Shaver Tunnel Adit, USDA-FS Road Nos. 8S02 and 8S02B, are proposed to be added to the Project Boundary. USDA-FS Road No. 8S02 is approximately 3.54 miles long and provides access from State Highway 168 to the Huntington-Pitman-Shaver Tunnel Adit. The road is closed to public vehicular traffic by a gate at Highway 168 that is controlled by SCE. The road is used exclusively by SCE to access the tunnel adit. USDA-FS Road No. 8S02B is a short road spur from USDA-FS Road No. 8S02 that leads to the tunnel adit entrance. SCE needs both roads for operation and maintenance of the Project. This Project Boundary modification should include a 50 ft ROW (25 ft from the centerline along both sides of the road). This Project Boundary modification will result in the addition of approximately 14.34 acres of federal land (Figure 3.1.3-12).

- USDA-FS Road No. 9S58, access road to Eastwood Power Station and the North Fork Stevenson Creek gage

  The access road to the North Fork Stevenson Creek gage (USDA-FS Road No. 9S58) is proposed to be added to the Project Boundary. This road provides access from the SCE controlled gate at Sierra Marina to the stream gage located on North Fork Stevenson Creek. This road also provides access to the Eastwood Power Station facilities located along the northeastern side of Shaver Lake. The 0.75 mile of the road is open for public recreation up to a second access gate controlled by SCE. Beyond the second gate, the road is closed to public vehicular traffic and is used exclusively by SCE to access the Eastwood Power Station and the North Fork Stevenson Creek Stream Gage. This Project Boundary modification will include a 50 ft ROW (25 ft from the centerline along both sides of the road). SCE needs this road for operation and maintenance of the Project. This Project Boundary modification will not increase Federal use land fees because the lands are owned by SCE (Figure 3.1.3-13).

- USDA-FS Road No. 9S58K, access road to Eastwood Power Station Entrance Tunnel

  The access road to the Eastwood Power Station entrance tunnel (USDA-FS Road No. 9S58K) is proposed to be added to the Project Boundary. This road provides access from USDA-FS Road 9S58 to the entrance tunnel leading to the Eastwood Power Station. This Project Boundary modification should include a 50 ft ROW (25 ft from the centerline along both sides of the road). SCE needs this road for operation and maintenance of the Project. This Project Boundary modification will not increase the Federal land use fees because the lands are owned by SCE (Figure 3.1.3-13).

- Access road to Eagle Point Boat Only Day-Use Area

  The access road to the Eagle Point Boat Only Day-Use Area is proposed to be added to the Project Boundary. The Eagle Point Boat Only Day-Use Area is located on the east side of Shaver Lake. Public access to this recreation facility is only via boat. SCE does maintain an access road to the boat-only day-use area. This access branches off USDA-FS Road No. 9S58 (discussed above). The access road to the boat-only day-use area is closed to public vehicular traffic. SCE uses this road exclusively to access the facility. SCE needs this road for operation and maintenance of the Project. This Project Boundary modification will include a 50 ft ROW (25 ft from the centerline along both sides of the road). This Project Boundary modification will not increase the Federal land use fees because the lands are owned by SCE (Figure 3.1.3-13).

- Trail to Big Creek stream gage below Dam 5

  The trail to the stream gage on Big Creek below Dam 5 is proposed to be added to the Project Boundary. SCE uses this trail to access and maintain the gaging station, SCE gage No. 105. The trail originates at the Canyon Road (USDA-FS Road No. 8S05) about a quarter mile from Big Creek Powerhouse No. 8 and terminates at the stream gage on Big Creek. SCE maintains the trail and is the primary user. The length of the trail is approximately 932 ft and the Project Boundary will include a 10 ft ROW (5 ft from the centerline on each side of the trail). This Project Boundary modification will result in the addition of approximately 0.19 acres of federal land (Figure 3.1.3-14).

- Bear Creek Stream Gage Trail

  The Bear Creek Stream Gage Trail is proposed to be added to the Project Boundary. SCE uses this trail to access and maintain the stream gage located on Bear Creek upstream of the Bear Creek Diversion. The trail originates at the Bear Creek Diversion Pool and travels along the west side of the forebay, and terminates at the stream gage located upstream on Bear Creek. SCE maintains the trail and uses it to access the stream gage. The length of the trail is approximately 1,813 ft and the Project Boundary should include a 10 ft ROW (5 ft from the centerline on each side of the trail). This Project Boundary modification will result in the addition of approximately 0.29 acres of federal land (Figure 3.1.3-15).

- Gaging station on South Fork San Joaquin River below Hooper Creek confluence (SCE gage No. 129)

  The diameter of the Project Boundary around the gaging station on the South Fork San Joaquin River below the Hooper Creek confluence (SCE Gage No. 129) is proposed to be increased to 100 ft from the current 20 ft diameter. This stream gage is used to measure flow in the South Fork San Joaquin River below the confluence with Hooper Creek and the increased lands are necessary for safe and efficient

maintenance and operation of the Project. This Project Boundary modification will result in the addition of approximately 0.18 acres of Federal land (Figure 3.1.3-16).

- Land surrounding the gaging station on Hooper Creek below Hooper Creek Diversion (SCE Gage No. 114) and the Hooper Creek Diversion helicopter landing site.

  The diameter of the Project Boundary around the gaging station, located on Hooper Creek below the Hooper Creek Diversion is proposed to be increased to 100 ft from the current 20 ft diameter. The Hooper Creek Diversion helicopter landing site should also be added to the Project Boundary. The Project boundary revision for the gaging station and the helicopter-landing site overlap each other. These additional lands are necessary for the safe and efficient operation and maintenance of the Project. This Project Boundary modification to include the stream gage and landing site will result in the addition of approximately 0.68 acres of federal land (Figure 3.1.3-16).

- Helicopter landing site at South Fork San Joaquin River at Florence Spill Station

  The helicopter landing site at the South Fork San Joaquin River Florence Spill Station above the Hooper Creek confluence is proposed to be added to the Project Boundary. SCE uses this landing site to access the stream gaging station (SCE Gage No. 128S) that is used to measure flows on the South Fork San Joaquin river below Florence lake. The landing site provides access during spill at Florence Lake and during the winter months, when vehicular access is not possible due to road closure from snow accumulation or high flow events. The landing site is located within a circular area 200 feet in diameter. This Project Boundary modification will result in the addition of approximately 0.72 acres of federal land (Figure 3.1.3-17).

- Helicopter landing site at Summit at Shaver Hill

  The helicopter landing site at the Summit (Shaver Hill) is proposed to be added to the FERC Project Boundary. This landing site is used as an alternative landing location when the Big Creek heliport is closed due to inclement weather. This landing site is necessary for the operation and maintenance of the Project. The landing site is located within a circular area 400 feet in diameter. This Project Boundary modification will not increase the Federal land use fees because the lands are owned by SCE.

- Helicopter landing site at Tiffany Pines at Camp Edison

  The helicopter landing site at Tiffany Pines (Camp Edison) is proposed to be added to the FERC Project Boundary. SCE uses this landing site to access Shaver Lake. This landing site is used as an alternative landing location when the Big Creek heliport is closed due to inclement weather. This landing site is necessary for the safe and efficient operation and maintenance of the Project. The landing site is located within a circular area 400 feet in diameter. This Project Boundary

modification will not increase Federal use land fees because the lands are owned by SCE (Figure 3.1.3-13).

- Helicopter landing site at Bear Creek Diversion

  The helicopter landing site at Bear Creek Diversion is proposed to be added to the Project Boundary. SCE uses this landing site to access the Bear Creek Diversion and stream gage. The helicopter-landing site is necessary for the safe and efficient operation and maintenance of the Project. The landing site provides access during the winter months, when vehicular access is not possible due to road closure from snow accumulation. The landing site is located within a circular area 400 feet in diameter. This Project Boundary modification will result in the addition of approximately 0.69 acres of federal land (Figure 3.1.3-15).

- Helicopter landing site at the South Fork San Joaquin River below Hooper Creek

  The helicopter landing site at the South Fork San Joaquin River below Hooper Creek is proposed to be added to the Project Boundary. SCE uses this landing site to access a stream gage (SCE gage No. 129) that is needed for the operation and maintenance of the Project. The landing site is located within a circular area 400 feet in diameter. This Project Boundary modification will result in the addition of approximately 2.9 acres of federal land (Figure 3.1.3-16).

- Helicopter landing site at Mount Givens Telecom Site

  The helicopter landing site at Mount Givens is proposed to be added to the Project Boundary. SCE uses this landing site to access a communication tower that is necessary for the safe and efficient operation and maintenance of the Project. The landing site provides access during the winter months, when vehicular access is not possible due to road closure from snow accumulation. The landing site is located within a circular area 70 feet in diameter. This Project Boundary modification will result in the addition of approximately 0.09 acres of land (Figure 3.1.3-18).

- Helicopter landing site at Florence Lake Dam

  The helicopter landing site at Florence Lake Dam is proposed to be added to the Project Boundary. SCE uses this landing site to access the dam. The landing site is necessary for the safe and efficient operation and maintenance of the Project. The landing site provides access during the winter months, when vehicular access is not possible due to road closure from snow accumulation. The landing site is located within a circular area 400 feet in diameter. This Project Boundary modification will result in the addition of approximately 0.16 acres of federal land (Figure 3.1.3-17).

- Helicopter landing site at the Mono Creek Diversion

  The helicopter landing site at the Mono Diversion is proposed to be added to the FERC Project Boundary. SCE uses this landing site to access the Mono Diversion

and Forebay, which are necessary for the safe and efficient operation and maintenance of the Project. The landing site is located within a circular area 400 feet in diameter. This Project Boundary modification will result in the addition of approximately 2.9 acres of land (Figure 3.1.3-19).

- Helicopter landing site at the Mono Creek below Lake Edison

  The helicopter landing site at the Mono Creek below Lake Edison is proposed to be added to the FERC Project Boundary. SCE uses this landing site to access a stream gage (SCE gage No. 119) that is necessary for the safe and efficient operation and maintenance of the Project. The landing site is located within a circular area 400 feet in diameter. This Project Boundary modification will result in the addition of approximately 2.9 acres of federal land (Figure 3.1.3-19).

3.1.3.4 Big Creek No. 3 (FERC Project No. 120)

Areas Proposed for Removal from the Existing FERC Project Boundary

- Excess lands around Dam No. 6 Forebay that are above the high water line

  The Project Boundary is proposed to be modified by removing excess Project lands from above the high water line around Dam 6 Forebay. SCE does not require any special access to the forebay shoreline. SCE does not need these lands to be included in the Project Boundary for the operation and maintenance of the Project, nor for other specified Project purposes. This Project Boundary modification will result in the removal of approximately 44.17 acres of federal land (Figure 3.1.3-20).

3.1.4 Project Operations

Operation of SCE's seven FERC-Licensed Projects in the Big Creek System (BCS) is managed from a watershed-wide perspective and on an individual project-by-project basis. The Big Creek Hydroelectric System consists of six major reservoirs (Thomas A. Edison, Florence, Huntington, Redinger, Shaver, and Mammoth Pool,) and nine powerhouses (Portal; Eastwood; Mammoth Pool; and Big Creek Powerhouse Nos. 1, 2, 2A, 3, 4, and 8). Figure 3.1.4-1 presents a schematic diagram of the seven FERC-Licensed Projects and associated reservoirs, water conveyance tunnels and powerhouses in the BCS. The operation of the BCS and the individual Projects is dependent on natural run-off during periods of snowmelt and wet weather and the operation of other components in the system, the amount of generation required for SCE's customers, and the dispatching of energy in accordance with the California Independent System Operator requirements.

SCE operates the four Big Creek ALP projects within the BCS in accordance with the FERC-license conditions, which includes MIF release requirements that are made by SCE from diversions and impoundments. Bypass and flow augmented stream reaches associated with each of the four Big Creek ALP Projects are listed in Table 3.1.4-1.

The management of water through the BCS and specifically the four Big Creek ALP Projects routes water between Projects in a manner that best meets the operational constraints that are imposed either by contractual operating agreements (i.e., licenses, permits, etc.) or by physical limitations of the Project infrastructure. The BCS is subject to several operating constraints including the following: (1) available water supply; (2) electrical system requirements; (3) both planned and unplanned maintenance outages; (4) storage limits (including both recreation minimums and year-end carryover maximums); (5) both minimum and maximum release limits (from storage); (6) various provisions contained in water rights agreements; and (7) California Independent System Operator requirements.

3.1.4.1 Water Rights and Contractual Obligations

Each of SCE's Big Creek Hydroelectric Projects either has separate water rights or shares one or more water rights with other projects for the diversion, use, and storage of water. The majority of the water rights are for non-consumptive uses associated with the generation of power. A few locations, such as the SCE's administrative offices and company housing near Big Creek No. 1 Powerhouse have minor consumptive water rights. SCE does not hold water rights for the consumptive use of water by any party other than SCE, nor does SCE sell any water rights associated with the hydropower projects to other parties.

SCE's water rights were obtained pursuant to state law and a majority of the water rights are documented by licenses and permits issued to SCE, or its predecessors, by the State Water Resources Control Board (State Water Board). Additional water rights were obtained through appropriation of water prior to the implementation of the Water Commission Act of 1914, and by prescriptive use against other parties. SCE also holds other water rights as a riparian land owner, which authorizes SCE to divert and use water on land owned by SCE. Table 3.1.4-2 summarizes the water right licenses and permits for the four Big Creek ALP Projects analyzed in this APDEA.

The water rights agreements contain stipulations that stem from the senior status of certain downstream water rights holders. Generally, any water right holder with senior rights began diverting water for consumptive purposes prior to SCE or its predecessors. To protect the rights of the downstream water rights holders, SCE entered into agreements that restrict the use of water within the BCS to non-consumptive purposes, i.e., hydroelectric generation. Certain agreements limit the length of time and amount of water that SCE can store in its Project reservoirs. In a few instances, SCE's non-consumptive water use is a senior water right, and other water users hold junior water rights.

SCE operates its reservoirs consistent with the Mammoth Pool Operating Agreement (MPOA), which specifies cumulative reservoir storage constraints based on the computed natural run-off for the water year at Friant Dam. The MPOA between SCE and the U.S. Bureau of Reclamation (Bureau) specifies water storage and release requirements for the BCS reservoirs, which are upstream of Friant Dam (Millerton Reservoir) and the associated Central Valley Project water distribution system operated

by the Bureau on behalf of the downstream irrigators. Millerton Reservoir is a major irrigation storage facility serving the central San Joaquin Valley agricultural community. Meetings between SCE, the Bureau, and the downstream irrigators are held following the March 1 runoff forecast each year, and periodically as needed, to coordinate and optimize hydropower production consistent with irrigation needs of the downstream agricultural users holding senior water rights and emergency flood control operations of Millerton Reservoir. The MPOA includes constraints on the annual and seasonal timing and volume of releases from SCE's reservoirs, maximum year-end storage allowed, and minimum seasonal flow from Dam No. 7 (release and diversion). Table 3.1.4-3 summarizes the storage constraints specified in the MPOA.

3.1.4.2 Water Management

This section provides a general overview of the existing water management of the seven Projects in the BCS followed by a description of water management specific to the four Big Creek ALP Projects analyzed in this APDEA.

BCS Water Management

A key component of the annual water management plan for the BCS is the development of an annual run-off forecast. The annual run-off forecast is developed based on snow pack and precipitation data collected in the vicinity of the Project. This information is used along with assumptions about future median precipitation and air temperatures to produce a run-off forecast through the end of the water year (September 30). The forecast includes an estimate of both the timing and the quantity of water that will enter Project reservoirs during that run-off season. Snow pack and precipitation data are shared with the California Department of Water Resources (DWR) and the USBR, who use it to develop individual forecasts of run-off volumes and declare water year types (critical, dry, below normal, above normal, or wet). The run-off forecast is a valuable tool for planning and ensuring compliance with the constraints of the MPOA (described above) and for planning purposes. A majority of the MPOA and other constraints are based on actual run-off volumes. The forecast also is used for directing future operational plans for: 1) instream flow release requirements; 2) reservoir recreational storage requirements; and 3) hydroelectric generation operations for the entire BCS.

The operation of the BCS is similar in all water year types in that water diverted from Project reservoirs and diversions is utilized to generate power. There are subtle differences, however, in the way that the Project is operated during different water year types and during different conditions of state energy requirements.

Some of the BCS reservoirs generally spill in wet and above normal water years and are filled to maximum capacity when spill ceases. When the BCS reservoirs stop spilling, SCE is able to manage the system with available inflows and begin managing the water to meet electric supply requirements by providing both base load and peak cycling energy. In the upper basin area, water from the upper South Fork San Joaquin River drainage is stored in Florence Lake and water from Mono Creek drainage is stored in Lake Thomas A. Edison. Water is diverted from these two lakes and various

other small backcountry diversions into Huntington Lake via the Ward Tunnel and the Mono-Bear Siphon. The volumes of water that can pass through Ward Tunnel and the siphon are limited by the physical size and layout of these conduits. Water deliveries to Huntington Lake are prioritized as follows: first priority is given to water from Florence Lake; second priority is given to water from Bear Diversion and Lake Thomas A. Edison; and third priority is given to water diverted from the small diversions at Camp 61 Creek, Camp 62 Creek, Chinquapin Creek and Bolsillo Creek. The water delivered to Huntington Lake may also pass through Portal Powerhouse at the exit of the Ward Tunnel depending upon the amount of water being transported.

BCS Power Generation

The BCS has three interlinked water chains or pathways through which water may be transported and used to produce power. The three water chains are:

- Huntington Water Chain: This chain consists of Portal Powerhouse, Powerhouse No. 1, Powerhouse No. 2, Powerhouse No. 8, Powerhouse No.3, and Powerhouse No. 4.

- Shaver Water Chain: This chain consists of Portal Powerhouse, Eastwood Power Station, Powerhouse No. 2A, Powerhouse No. 8, Powerhouse No. 3, and Powerhouse No. 4.

- Mammoth Water Chain: This chain consists of Mammoth Pool Powerhouse, Powerhouse No. 3, and Powerhouse No. 4.

After passing through or bypassing the Portal Powerhouse, water entering Huntington Lake is directed to either the Huntington Chain, or the Shaver Chain. If the generation from the powerhouses of either chain is increased or decreased proportionally, the changes in load will have no effect on the MIF, or total levels of the storage reservoirs and forebays within the BCS. Changes in total loading conditions of the two chains can, however, affect Florence Lake and Lake Thomas A. Edison and can affect the amount of water leaving the project at Powerhouse No. 4. If generation from the powerhouses of either chain is changed disproportionately, the levels of Huntington Lake, Shaver Lake, and Redinger Lake can be increased or decreased.

Water from Big Creek Powerhouse Nos. 1 and 2 in the Huntington Chain joins water from the Shaver Chain, which has already passed through Eastwood Power Station and Big Creek Powerhouse No. 2A, at the Big Creek Powerhouse No. 2 and 2A Tailrace (Dam 5). Water from these two chains is then diverted through Big Creek Powerhouse No. 8, after which it joins the waters of the San Joaquin River coming from the Mammoth Chain at the Big Creek No. 8 Tailrace (Dam 6 Impoundment). Water from all three chains then continues through Big Creek Powerhouse Nos. 3 and 4.

Waters from the Middle Fork and North Fork San Joaquin River (SJR) drainages, and the South Fork SJR flows not diverted at Florence Lake, Lake Thomas A. Edison, Bear Creek Forebay, and the small backcountry diversions, are collected in Mammoth Pool

Reservoir and become part of the Mammoth Chain. Mammoth Pool Powerhouse is usually run at maximum during the high flow or run-off period to prevent or delay spill at Mammoth Pool Reservoir.

For the most part, Portal Powerhouse, Eastwood Power Station, and Big Creek No. 4 Powerhouse operate independently of the other powerhouses in the BCS. Portal Powerhouse opportunistically uses water passing through the Ward Tunnel for power generation, but only operates efficiently at moderate flows through Ward Tunnel. Ward Tunnel flows outside the efficient flow range of Portal Powerhouse bypass Portal Powerhouse through a Howell-Bunger (HB) valve into Huntington Lake. Eastwood Power Station generation normally occurs during the peak demand period of the day, unless water is being moved continuously from Huntington Lake to Shaver Lake to avoid spill at Huntington Lake or to increase storage at Shaver Lake for use during peak periods. Maintaining storage (water surface levels) to maintain recreational needs at Huntington Lake and above pump-back minimum water surface level in Shaver Lake are important considerations when planning operations at Eastwood Power Station. Big Creek Powerhouse No. 4 is the last power generation opportunity in the Big Creek System and therefore adjustments in the operation of the Powerhouse No. 4 will not affect other upstream powerhouses in the BCS.

Generally, the three water chains of the BCS are operated around the clock in the spring run-off period, except in dry water years. Operational flexibility is limited during normal run-off because the amount of water run-off available exceeds the combined generation and storage capacity of the project, resulting in water flowing over spillways or “spill”.

After the end of the spill period, daily unit plant load schedules are established to maximize hydro resources during system peak load periods. When spring run-off is finished, if a powerhouse does not need to operate for water management, it is run preferentially during on-peak hours. Due to the nature of the energy market and SCE’s resources, it is generally beneficial for the Big Creek Projects to provide power during on-peak hours, once the spring run-off has finished. Since the BCS powerhouses discharge to reservoirs or forebays, the peaking operations generally do not cause varying flows in bypass reaches. Energy load changes on these power generation chains will not affect the WSE’s or instream flows, as long as adjustments are made to match reservoir inflows and outflows. A proprietary computer model used for predicting inflow is also used to plan monthly flow of water through the Project to meet the operating constraints on the system while maximizing generation during the peak load periods. In addition, computer programming of load schedules to use the most efficient units first, further enhances these operating activities and improves system integrity and efficiency. These activities can ensure the efficient use and availability of hydroelectric generation resources from these reservoir storage plants.

Market constraints and pricing, as well as transmission constraints and weather, will affect generation and operations at the Big Creek Projects. Often during the spring run-off season there is a financial disadvantage for SCE to generate energy even though to avoid generation would cause spill to occur. A simplified description of the California

energy market describes the Independent System Operator (ISO) as having the role of balancing energy demand and supply in the state. The ISO takes the energy demand forecast, the transmission system constraints, and the energy that is bid into the day-ahead market to determine the acceptable energy supply. The ISO then adjusts the supply load on a real-time basis to account for changing conditions. If the ISO believes that there is a surplus of energy available beyond that necessary to supply the grid, prices in the California energy market for additional energy could be negative. This situation would require SCE to pay for contributing additional energy.

BCS Reservoir Water Storage

The following characterizes water storage in reservoirs associated with the BCS. New environmental measures are proposed to support reservoir-based recreation and to maintain reservoir water surface elevations for reservoirs associated with the four Big Creek ALP Projects, including Huntington Lake, Florence Lake, Shaver Lake, and Mammoth Pool Reservoir. Refer to Section 3.1.7.3 for a summary of these measures.

Thomas A. Edison Lake

Lake Thomas A. Edison (Edison Lake), a component of the Vermilion Project (FERC Project No. 2086), is among the highest elevation reservoirs in the BCS. Edison Lake is located on, and stores water from, Mono Creek along with various other tributaries, including Warm Creek. Water released from storage at Edison Lake is diverted approximately 1 mile downstream at Mono Creek Diversion (part of FERC Project No. 67) into the Mono-Bear Siphon. Water also can be diverted from the Bear Creek Diversion into the Mono-Bear Siphon. Water diverted into the Mono-Bear Siphon flows into Ward Tunnel. Edison Lake has a relatively large storage capacity compared to drainage area. Thus, during the spring run-off period in non-spill years, the majority of inflow into Edison Lake is stored and not released until late summer. In spill years, however, the inflow into Edison Lake is stored until the threat of spill at Florence Lake and Bear Creek Diversion has passed, then releases from Edison Lake are commenced, to avoid using the emergency spillway at Edison Lake. Peak storage at Edison Lake normally occurs sometime during July and August.

Florence Lake

Florence Lake, a component of the Big Creek No. 2A, 8 and Eastwood Project (FERC No. 67), is a high elevation reservoir that stores water from the South Fork San Joaquin River and other small tributaries including Hooper creek. Water stored at Florence Lake is diverted into Ward Tunnel, as is water from Bolsillo, Chinquapin, Camp 62, and Camp 61 creeks. Priority is given to water being diverted from Florence Lake if spill is imminent at that location. Water being diverted from Edison Lake is given last priority because it is the least likely to spill due to its large storage capacity. Water diverted into Ward Tunnel passes under and is hydrologically connected to Portal Forebay. The water eventually exits Ward Tunnel through Portal Powerhouse or the HB valve, and is stored in Huntington Lake.

Florence Lake storage is kept near its minimum level (1,000 ac-ft) during the winter months to avoid damage on the dam face from freezing water. The storage of water usually begins to increase in late April. After the peak storage level is reached in late spring/early summer, the reservoir elevation gradually declines until it again reaches its minimum storage level in the late fall.

Huntington Lake

Huntington Lake, a component of the Big Creek Nos. 1 & 2 Project (FERC No. 2175), is also a relatively high elevation reservoir that stores water from the backcountry lakes and diversions via the Ward Tunnel. Water from Huntington Lake may be sent to either Big Creek Powerhouse No. 1 or Shaver Lake via Balsam Forebay or North Fork Stevenson Creek. A good faith effort is made by SCE to keep Huntington Lake as full as practicable with minimum fluctuation from Memorial Day through Labor Day weekend, for recreational uses. However, during wet years it becomes necessary to keep the storage lower until after local uncontrolled peak inflows have passed. Spill could occur if local uncontrolled inflows exceed Huntington Lake water diversion capacities. Due to downstream safety issues and domestic water issues for the town of Big Creek, spill is avoided at Huntington Lake, if possible.

Shaver Lake

Shaver Lake, a component of the Big Creek No. 2A, 8 and Eastwood Project (FERC No. 67), is a moderate elevation reservoir that stores water from Huntington Lake via Eastwood Power Station or Tunnel 7 (through Gate 2) and local inflows from North Fork Stevenson Creek and other small tributaries. Water storage at Shaver Lake is not noticeably altered on a daily basis by pump-back operations at Eastwood Power Station, which usually occur during the late-night/early-morning hours from spring through fall, depending on water availability. During this period, the reservoir is generally kept at a high water surface elevation to enable the use of the pump-back capability. In pump-back mode, the Eastwood Power Station pumps water from Shaver Lake and returns it to Balsam Forebay. This water is used again the following day, for generation through Eastwood Power Station, and returned to Shaver Lake. In order for pump-back generation to occur, Shaver Lake has to be above a minimum elevation of 5,342 ft, or 78,426 ac-ft of storage. During Wet Water Years, Shaver Lake storage will be drawn down below this pump-back minimum elevation in the spring/early summer to create storage space for the upcoming run-off and to minimize the potential for spilling Shaver Dam. Water from Shaver Lake is diverted to Powerhouse No. 2A through Tunnel 2, and is also released to Stevenson Creek, which is a tributary to the San Joaquin River downstream of Dam 6.

Mammoth Pool

Mammoth Pool Reservoir, a component of the Mammoth Pool Project (FERC No. 2085), is a moderate elevation reservoir that stores water from the San Joaquin River and other small tributaries. The drainage area of Mammoth Pool Reservoir is by far the largest of all the Project reservoirs, relative to the reservoir size. As a result, Mammoth

Pool Reservoir spills more often than the other Project reservoirs. In most cases, spill at Mammoth Pool Dam will also result in spill below Dam 6 and Redinger Lake. Ideally, minimum storage at Mammoth Pool Reservoir will occur just prior to the beginning of spring run-off to maximize storage space availability. After the threat of spill has passed, storage at Mammoth Pool Reservoir declines at a rate necessary to ensure compliance with the September 30th storage requirement in the MPOA. Consideration is given to flood control issues when determining the optimal storage level at Mammoth Pool Reservoir during the winter months.

Redinger Lake

Redinger Lake, a component of the Big Creek No. 4 Project (FERC No. 2017), is a lower elevation reservoir that stores water from local inflows and water from Powerhouse No. 3. Water storage at Redinger Lake is normally kept near capacity throughout the year, except during annual maintenance. The California Division of Safety of Dams requires annual maintenance on the spillway gates at Redinger Lake. This requirement makes it necessary to reduce the storage at Redinger Lake to below 13,000 ac-ft, which affects the Water Surface Elevation (WSE) for approximately three weeks out of the year. This maintenance is usually performed in late October.

3.1.4.3 Big Creek ALP Projects Water Management

Mammoth Pool (FERC Project No. 2085)

The Mammoth Pool Powerhouse, located on the San Joaquin River, can be operated locally from the Mammoth Pool Powerhouse control room or remotely from Big Creek Powerhouse No. 3 (FERC Project No. 120) which serves as the main control center for the entire SCE BCS. The flow of water through the Mammoth Pool Project is dependent on natural run-off during periods of snowmelt and wet weather and the operation of other components of the BCS that are located at higher elevations within the watershed. Mammoth Pool Reservoir receives flow from a large watershed that includes: Chiquito, Jackass, Dalton, and Granite Creeks, and the North, Middle, and South Forks of the San Joaquin River. Mammoth Pool Powerhouse is the first generating opportunity in the Mammoth Chain and moves water from Mammoth Pool Reservoir to the Dam 6 impoundment.

Under existing operations, water for the Mammoth Pool Project is diverted at the Mammoth Pool Reservoir on the San Joaquin River and from Rock Creek and Ross Creek (tributary streams to the San Joaquin River downstream of Mammoth Pool Reservoir). Water passing through the powerhouse enters the San Joaquin River just upstream of Dam 6 Impoundment, also known as Big Creek No. 3 Forebay (a component of the Big Creek No. 3 Project, FERC Project No. 120).

In Wet Water Years, the Mammoth Pool Project generally runs at full capacity beginning in April and can continue at full capacity well into the summer months. Wet Water Year operations usually provide a surplus of water and Mammoth Pool Powerhouse operates as much as possible during the spring run-off period. Mammoth Pool will usually begin

to spill earlier than the upstream reservoirs due to its lower elevation and large watershed area relative to its reservoir capacity. In a typical Wet Year, Mammoth Pool Powerhouse will operate at full capacity until SCE gains control of inflows. At that time SCE will manage powerhouse operations to meet base load requirements and/or peak cycling energy needs.

In Above Normal Water Years the Project generally runs at full capacity beginning in April or May, providing base load power until the end of peak run-off, which typically occurs in June. Mammoth Pool Reservoir generally spills in an Above Normal Water Year. When SCE has the ability to control inflows, SCE will manage powerhouse operation to match reservoir inflows, to meet base load requirements, and/or meet peak cycling energy needs. As inflows decrease during the summer, less flow is available for generation. Water is then used during peak generation periods to maximize the value of the energy. In the fall months, the reservoir begins to be lowered in anticipation of the winter and in accordance with the terms of the MPOA between SCE and the BOR. The months with the lowest generation are October through December, when the Mammoth Pool Reservoir inflows decrease.

During drier water years, the Project may run at full capacity for a shorter duration in May and June, based on inflows. If both reservoir storage and Project inflows are low, then the powerhouse will not be operated at full capacity in order to fill the reservoir to maximum capacity for the summer recreational season. Project generation is lower at the Mammoth Pool Powerhouse and very little or no water spills at Mammoth Pool Dam in drier water years.

Under the Proposed Action, water management goals and operations would remain generally the same as under the existing operations.

Big Creek Nos. 1 and 2 Project (FERC Project No. 2175)

The Big Creek Nos. 1 and 2 powerhouses, located on Big Creek, can be operated locally from the control rooms at Powerhouse No. 1 or Powerhouse No. 2, or remotely from Big Creek Powerhouse No. 3 (FERC Project No. 120), which serves as the main control center for the entire BCS. The water used by the Project is stored in Huntington Lake, which includes local run-off and water conveyed through Ward Tunnel from Florence Lake (FERC License No. 67), Lake Thomas A. Edison (FERC No. 2086), and from various small and intermediate size stream diversions. Powerhouse No. 1 utilizes water from Huntington Lake and discharges into the Dam 4 impoundment on Big Creek. Powerhouse No. 2 receives water from the Dam 4 impoundment and discharges to the Dam 5 impoundment on Big Creek.

The Big Creek Nos. 1 and 2 Project operates in conjunction with the rest of the BCS in a parallel and stair step sequence of water chains. Big Creek Powerhouses No. 1 and 2 represent the second and third generating opportunities in the Huntington water chain, respectively. The flow of water through the Powerhouse Nos. 1 and 2 Project is dependent on natural run-off during periods of snowmelt and wet weather and the

operation of reservoirs in the BCS that are located at higher elevations within the drainage.

The operation of the Powerhouse Nos. 1 and 2 Project is similar in all water year types in that water diverted into the Project from remote impoundments and diversions is utilized to generate power when the water is available. In Wet Water Years, the Project usually runs at full capacity beginning in mid-April to May until the end of peak run-off, which typically occurs in late July and SCE gains control of inflows. Then, SCE will manage powerhouse operations to meet base load requirements and/or peak cycling energy needs. Project generation is greater during Wet Water Years and spills can occur at Dam 4.

In Above Normal Water Years, the Project is generally run at full capacity beginning in May until the end of peak run-off, which typically occurs in July. Some of the BCS reservoirs generally spill in Above Normal water years and are filled to maximum capacity until spill ceases. At that time, SCE gains control of inflows and begins managing the water to meet grid requirements by providing both base load and peak cycling energy.

During Dry Water Years, the Project may run at full capacity for a short duration in May and June. In some dry water years, the Project does not run at full capacity in order to fill the reservoirs to maximum capacity. Project generation is lower in Dry Water Years and very little water, other than required dam seepage and MIF releases, bypasses the powerhouses.

Under the Proposed Action, water management would remain generally the same as the existing operations. However, under the Proposed Action, MIF's would be released from Dam 4, Balsam Creek Diversion, and Ely Creek Diversion.

Big Creek Nos. 2A, 8, and Eastwood Project (FERC Project No. 67)

The Big Creek Nos. 2A, 8 and Eastwood Project covers the largest geographical area of all seven projects in the BCS. The Project includes: (1) Florence Lake, and a number of small diversions in the high elevation backcountry or upper basin area; (2) Shaver Lake, located on Stevenson Creek; (3) Eastwood Power Station (EPS), which discharges to Shaver Lake; (4) Powerhouses 2A and 8, located along Big Creek. Powerhouses 2A and 8, and the Eastwood Power Station may be operated locally from the control rooms at each powerhouse or remotely from Big Creek Powerhouse No. 3 (FERC Project No. 120), which serves as the main control center for the entire BCS.

The flow of water through the Powerhouse Nos. 2A, 8 and EPS Project is dependent on natural run-off during periods of snowmelt and wet weather and the operation of other components of the BCS that are located at a higher elevation within the drainage. The Powerhouse Nos. 2A, 8 and EPS Project operate in tandem with the rest of the BCS in a parallel and stair step sequence of water chains. The EPS and Powerhouse No. 2A are in the Shaver Lake Water Chain and Powerhouse No. 8 is in both the Shaver Lake Water Chain and the Huntington Water Chain. The EPS receives water from Balsam

Meadow Forebay, which is filled via the Huntington-Pitman-Shaver Conduit from Huntington Lake or through water pumped back from Shaver Lake, and discharges to Shaver Lake. The EPS may operate as a pump storage project in all water year types after the run-off period has ended and SCE gains control of reservoir inflows in the BCS. Powerhouse No. 2A receives water from Shaver Lake and discharges to the Dam 5 impoundment on Big Creek. Powerhouse No. 8 utilizes water from the Dam 5 impoundment and discharges to the Dam 6 impoundment on the San Joaquin River.

The operation of all three powerhouses of Big Creek Nos. 2A and 8 and EPS are similar in all water year types, in that water diverted into the Project from remote impoundments and diversions is utilized to generate power when the water is available. In Wet Water Years, the Project runs at full capacity beginning in mid-April to May until the end of peak run-off, which typically occurs in late July. At that time, SCE gains control of inflows and begins managing powerhouse operations to meet grid requirements by providing both base load and peak cycling energy. Project generation is greater during Wet Water Years and water may be also bypassed around Project powerhouses at Project reservoirs and impoundments, if necessary.

In Above Normal water years, the Project is generally run at full capacity beginning in May until the end of peak run-off, which typically occurs in July. Some of the BCS reservoirs generally spill in Above Normal water years and are filled to maximum capacity until spill ceases. At that point, SCE gains control of inflows and begins powerhouse operations to meet grid requirements by providing both base load and peak cycling energy.

During Dry Water Years, the Project may run at full capacity for a short duration in May and June. In some dry water years the Project does not run at full capacity in order to fill the reservoirs to maximum capacity. Project generation is lower in Dry Water Years and very little water, other than dam seepage and required MIF releases, bypasses the powerhouses.

Under the Proposed Action, water management would remain generally the same as existing operations with the exception of the decommissioning of four back-country small diversions including: North Slide Creek Diversion, South Slide Creek Diversion, Tombstone Creek Diversion, and Crater Creek Diversion.

Big Creek No. 3 Project (FERC Project No. 120)

The Big Creek No. 3 Project Powerhouse, located on the San Joaquin River, is operated locally from the Big Creek No. 3 Powerhouse control room or remotely from the Big Creek dispatch center which serves as the main control center for the entire SCE Big Creek Hydroelectric System. The flow of water through the Big Creek No. 3 Project is dependent on natural run-off during periods of snowmelt and wet weather, and the operation of other components of the Big Creek Hydroelectric System that are located at higher elevations within the drainage. Big Creek Powerhouse No. 3 is one of the last generating opportunities in each of the water chains listed above, as water is moved from Florence Lake, Edison Lake, Huntington Lake, Shaver Lake, Mammoth

Pool, and various tributaries through the water chains. The Project receives water from the Dam 6 impoundment and discharges into Redinger Lake. The Powerhouse No. 3 Project operates in conjunction with the rest of the BCS in a stair step sequence of water chains.

The operation of the Powerhouse No. 3 Project is similar in all water year types in that water diverted into the Project from remote impoundments and diversions is utilized to generate power when the water is available. In wet years, the Project is generally run at full capacity beginning in May until the end of peak run-off, which typically occurs in late July. Once SCE gains control of inflows, powerhouse operation is managed to meet grid requirements by providing both base load and/or peak cycling energy. Project generation is greater during Wet Water Years and the Dam 6 outlet works and spillway may be used to also bypass water around the powerhouse, if necessary.

In Above Normal water years, the Project is generally run at full capacity beginning in May until the end of peak run-off, which typically occurs in July. Some of the BCS reservoirs generally spill in Above Normal water years and are filled to maximum capacity until spill ceases. At that time, SCE gains control of inflows and begins managing powerhouse operations to meet grid requirements by providing both base load and/or peak cycling energy. The water flow through the Big Creek No. 3 Powerhouse is generally matched to the flow entering Dam 6.

During Dry Water Years, the Project may run at full capacity for a short duration in May and June. In some dry water years, the Project does not run at full capacity in order to fill the reservoirs to maximum capacity. Project generation is lower in Dry Water Years and very little water, other than dam seepage and required MIF releases, bypasses the powerhouses.

Under the Proposed Action, water management would remain generally the same as existing operations.

3.1.5 Project Maintenance

Maintenance activities for the Projects are largely conducted at and within Project buildings and structures. Some maintenance activities are also conducted on lands adjacent to these structures, which could potentially have environmental effects. These maintenance activities include vegetation management, rodent control, road maintenance, and sediment management. Each of these activities is described below.

3.1.5.1 Vegetation

Vegetation management, including measures to prevent the establishment of noxious weeds, occurs at several locations adjacent to the four Big Creek ALP Project structures (i.e., Project recreation facilities, helicopter landing sites, roads, and trails). Vegetation management includes trimming of vegetation by hand or with equipment as well as the use of herbicides. Refer to Table 3.1.5-1 for a list of vegetation management activities that occur at each Project facility. Table 3.1.5-1 also provides the frequency that the management activity typically occurs at each location. In general, vegetation

management activities occur during the spring and early summer to avoid work during high fire danger periods.

Vegetation management is limited to the area necessary to reduce fire hazard, protect the integrity of dams, and provide worker/public health and safety. In general, vegetation management typically occurs within a 150 ft radius around Project facilities (dams, small and moderate diversions, gaging stations, powerhouses, and transmission lines) and recreation facilities. Vegetation management occurs within 10 ft of Project roads and within 2 ft of trails. These areas will be reduced, as required by the Valley Elderberry Longhorn Beetle (VELB) Management Plan, approved by the United States Fish and Wildlife Service (USFWS) to protect habitat potentially supporting the VELB.

SCE implements a combination of manual, mechanical, and chemical methods to control vegetation in the vicinity of the four Big Creek ALP Projects. Selection of appropriate control methods is based on an evaluation of worker/public health and safety, potential environmental effects, effectiveness of methods based on vegetation and site characteristics, and economics.

The methods used for general vegetation management are also useful for noxious weed control, when timed correctly and applied appropriately. The goal of noxious weed control efforts is to physically remove noxious weed plants and to prevent seed set for several consecutive years until there are no viable seeds remaining in the soil. The following is a summary of manual and mechanical vegetation management methods and chemical control (i.e., herbicides) used in the vicinity of the four Big Creek ALP Projects.

Vegetation Trimming by Hand (Manual)

One of the methods used to trim vegetation in the vicinity of the four Big Creek ALP Projects is with hand tools. This includes trimming of grasses and forbs with a string trimmer as well as removing or trimming of overhanging limbs of shrubs and trees with a chain saw or other hand-held saw. This management activity is implemented on an as-needed basis in conjunction with facility inspections.

Vegetation Trimming with Equipment (Mechanical)

Vegetation in the vicinity of the Projects is also trimmed using mechanical equipment, including a flail-type mower. A flail mower is a cutting device attached to a tractor that is used to cut brush along roadsides. As with trimming of vegetation by hand, this activity is implemented on an as-needed basis.

Herbicide Use (Chemical)

Herbicides are necessary, in addition to manual and mechanical methods, to effectively control weeds when the terrain in the vicinity of the four Big Creek ALP Projects is steep and difficult to walk, and hand-pulling or mowing are impractical and less safe. Application of herbicides requires that far less time be spent walking steep slopes,

resulting in less risk to workers, and less soil disturbance. Less soil disturbance can minimize erosion and sedimentation. A description of herbicide use is provided below.

After vegetation has been reduced by manual or mechanical methods, herbicides are sometimes applied to further control vegetation, including noxious weeds, at some locations. Two methods of herbicide application, basal and foliar application techniques, are utilized. Basal application is used for shrub species and includes cutting of a shrub and applying an oil-based herbicide directly to the stump. Foliar application techniques include hand spraying of herbicides with an additive or other agent to control overspray. The application of all herbicides is performed or supervised by a certified pesticide applicator, in compliance with the specified herbicide application prescription.

The herbicides and other agents used in the vicinity of the four Big Creek ALP Projects are listed in Table 3.1.5-2. A complete description for each herbicide or other agent is provided in the Vegetation and Integrated Pest Management Plan (SCE 2007a; Volume 4, SD-G (Books 19 and 24)). If different herbicides become available or required in the future, SCE will contact the USDA-FS and USFWS to obtain permission to substitute or add them to the herbicides listed in Table 3.1.5-2.

Herbicides and other chemical agents used in the vicinity of the four Projects are as follows:

- Garlon 4® and Hasten® (a vegetable oil-based additive) are combined and applied using a basal bark application technique.
- Garlon 4® and Accord® are combined and applied using a foliar application technique.
- Accord® is used by itself, or combined with either R-11® or In-Place®, and applied using basal bark and foliar techniques.
- Pathfinder® is used as a spot treatment to treat individual plants.
- Velpar® is used as a pre-emergent and is applied directly to moist soil to treat grasses and broad-leaved plants.

3.1.5.2 Rodent Control

SCE currently implements rodent control in the vicinity of the four Big Creek ALP Projects under a 1993 Memorandum (Rodent Control on Earth Filled Dams—Northern Hydro Region—Environmental Compliance (SCE 1993)) and a Fresno County Agricultural Commissioner Operator Identification Number. Regulations and requirements are strictly followed by SCE while using rodenticides, including toxicants, anticoagulants and fumigants, for vertebrate pest control. Rodenticide use at the four Big Creek ALP Projects is restricted to earthen dams and the interior of Project facilities, as described below.

Earthen Dams

Rodent control is necessary on Project earthen dams, where rodent burrowing activity is considered a threat to dam integrity. Rodent control is currently implemented at the following locations:

- Mammoth Pool Spillway (Mammoth Pool, FERC Project No. 2085)
- Balsam Dam (Big Creek Nos. 2A, 8, and Eastwood, FERC Project No. 67)

Rodent control at these locations involves using habitat modification (vegetation control) in combination with rodenticide treatments including fumigants (e.g., gas cartridges) and anticoagulant-treated oats and grains, specifically 0.005% Diphacinone. Specimen labels or Material Safety Data Sheets (MSDS) for both rodenticides are provided in the Vegetation and Integrated Pest Management Plan (SCE 2007a; Volume 4, SD-G (Books 19 and 24)).

Facility Interiors

Rodent populations inside Project facilities can pose a human health risk and may damage interior Project components (e.g., control panels, wiring). Therefore, rodent control is currently implemented in powerhouses, gaging stations, and other facilities of the four Big Creek ALP Projects. SCE implements rodent control in facility interiors using non-restricted rodenticides and trapping (e.g., snap traps).

3.1.5.3 Road Maintenance

SCE conducts routine road maintenance activities including grading/graveling of unpaved roads; paving or patching of existing paved roads; cleaning of culverts and ditches; vegetation trimming along road margins by hand or mechanical means; snow removal, and sanding. These activities are conducted on an as-needed basis. Vegetation control along Project roads is conducted consistent with the measures provided in the vegetation and Integrated Pest Management Plan and the USFWS approved Valley Elderberry Longhorn Beetle Management Plan. This latter plan was developed to protect habitat potentially supporting the VELB. Table 3.1.5-3 provides information on the type and frequency of SCE's maintenance activities on Project roads. Information on vegetation management along Project roads is provided in Table 3.1.5-1. SCE also maintains signage, fencing, and gates along several of the Project roads.

3.1.5.4 Sediment Management

Sediment management activities occur at many of the dams and diversions in the four Big Creek ALP Projects. Refer to Table 3.1.5-4 for a list of the sediment management activities that occur at various dams and diversions and the frequency and time of year that the management activity typically occurs at each location. In general, the sediment management activities occur throughout the year.

SCE conducts sediment management activities at certain facilities to ensure the operational capability to efficiently divert water and ensure the safety of dams. Sediment deposition, sometimes including large woody debris, can interfere with operation of diversion intakes and low level drain gates in dams. Sediment maintenance is not intended to completely remove all the sediment and debris from the impoundments or to maintain water storage capacity. The maintenance is primarily intended to reduce sediment entrainment into the diversions or blockage of drain gates. Regular sediment management activities can reduce the volume of the sediment load that may accumulate within the impoundments.

Sediment Control

SCE implements a combination of methods to control sediment, including physical removal by hand and equipment, sediment trap or sand box, and sediment pass-through. Each method is summarized below.

Physical Removal by Hand

One of the methods used to control sediment at small diversions is by hand removal. Sediment containment structures (e.g., hay bales, geofabric and rock, and sand bags) are placed in the channel immediately downstream of the low-level outlet during maintenance, and trapped sediments are removed from the containment structure. Physical removal by hand typically occurs annually or one or more times in a 5-year period. This management activity is implemented on an as-needed basis.

Physical Removal with Equipment

Sediment at certain Big Creek ALP Project facilities is removed using mechanical equipment, such as backhoes, mobile cranes with clamshells, excavators, or other earth-moving equipment. The equipment is used to excavate sediment and debris from behind the dam to keep the intake and drainage structures clear and operational. Sediment is loaded into a dump truck and moved off-site away from the channel and drainage pathways. This management activity is implemented on an annual basis at:

- Mono Creek Diversion, Hooper Creek Diversion, and Bear Creek Diversion (components of FERC Project No. 67)

Physical removal is implemented infrequently (typically occurs during a 20-year period but less than once every 5 years) at the following facilities:

- Mono Creek Diversion, Hooper Creek Diversion, Pitman Creek Diversion Forebay, Dam 5 and Dam 6 (components of FERC Project Nos. 67, 120, 2175)

- Rock Creek and Ross Creek diversions (FERC Project No. 2085)

- Ely Creek Diversion (FERC Project No. 2175)

Hydraulic Sluicing

Sediment is hydraulically sluiced, in addition to mechanical removal, at the Dam 6 impoundment (FERC Project No. 120) on an infrequent basis.

Facility Testing

Certain activities associated with inspections and testing of facilities may cause the release of sediments. Specifically, these activities include tunnel inspections and gate and valve testing, as summarized below.

Tunnel Inspection

Tunnel inspections that occur at Tunnel 2 (FERC Project No. 2175), Tunnel 8(FERC Project No. 67) and Tunnel 3 (FERC Project 120) require draining the impoundments at the head of those tunnels, which may cause the release of accumulated sediment through the drain gates. These tunnel inspections are mandated by FERC and occur periodically (approximately once every seven years). The inspections typically last less than one week and currently occur during the summer or fall.

Gate and Valve Testing

Valve and gate testing is performed annually under FERC requirements at all the Project reservoirs and diversions. Typically, the valves and gates are not fully opened and are only opened for a few minutes. The potential to release sediments during these tests is considered to be limited and inconsequential, with no likely effects downstream to geomorphic or aquatic habitat resources.

Project Operations

High Flow Release

Sediment may be released downstream when the HB valves are opened at Mammoth Pool Reservoir (FERC Project No. 2085) or Shaver Lake (FERC Project No. 67) to make releases prior to a spill. This may cause temporary increases in turbidity. The HB valves are the only sizable controlled point of release to the downstream channels. SCE typically controls Shaver Lake to avoid spilling the dam and can release up to 600 cfs through the HB valve for this purpose, commonly in two out of three years. The maximum capacity of the HB valve (1,800 cfs) at Mammoth Pool Reservoir is insufficient to prevent spills in wet and above normal water years. Over the long-term, Mammoth Pool Reservoir spills about 50% of the time.

Channel Riparian Maintenance Flows (CRMF)

SCE does not currently release CRMF, other than spills, which frequently occur at certain locations under existing operations. These flows are designed to transport sediments, in part, and thereby maintain channel morphology and support riparian habitat. CRMF are recommended at Mono Diversion and at Florence Lake in the

Proposed Action (see Section 3.1.7.1). Frequent spills occurring at Mammoth Pool Dam and Dam 6 will function as CRMF.

3.1.5.5 Large Woody Debris Management

SCE conducts large woody debris (LWD) management at large and moderate size dams and small diversions.

SCE periodically, as needed, removes LWD that accumulates behind dams and diversion structures after spring run off or large flow events. SCE conducts visual inspections of the dams and diversions annually following spring run-off or other peak flow events. If more than sparse LWD is observed behind the dams and diversions, then it is collected and removed. Any LWD that is too large to transport is cut into manageable size using chainsaws. At Mammoth Pool Dam and Florence Dam, LWD is transported and stockpiled at the mouth of the spillway and left in place pending the next spill event that will flush the LWD into the river downstream of the dam. At Shaver Lake Dam, LWD is transported from the reservoirs and either disposed of or burned. At moderate and small size diversions, LWD is placed in the stream channel downstream of the diversion structure.

LWD removal is prevalent at the diversions in high flow water years and occurs less intensively during years with less run-off and less delivery of LWD to the diversions.

3.1.6 Existing Environmental Measures

The following section summarizes existing programs, measures and facilities maintained by SCE for the protection and enhancement of the Basin resources by major resource category. These existing environmental measures would continue under the Proposed Action at each of the four Big Creek ALP Projects, unless otherwise indicated.

3.1.6.1 Water and Aquatic Resources

- Continue implementation of MIF measures.

  SCE currently provides MIFs for aquatic habitat and protection of beneficial uses in accordance with existing FERC license conditions. Implementation of MIFs would continue, but at different levels in most bypass and augmented stream reaches.

- Continue to maintain gaging stations located in the vicinity of the Projects.

  SCE currently maintains an extensive network of stream and lake gaging stations in the Basin to monitor and record the storage and flow of water. This network consists of 17 USGS stations that measure flow in rivers and creeks, six USGS stations that measure reservoir elevation and storage on SCE's reservoirs, and nine USGS gaging stations that measure flow through the tailraces of SCE's nine hydroelectric powerhouses.

3.1.6.2 Terrestrial Resources

- Continue to implement Environmental Training Program

  SCE employees attend environmental training sessions on a regular basis, as well as on an as-needed basis. These training sessions include a review of background material, permit conditions, and instructions on how to avoid impacts on biological or cultural resources. Project-specific meetings also may be conducted in the field on a job-specific or activity-specific basis to review appropriate management protocols (avoidance and protection measures) in environmentally or culturally sensitive areas.

- Continue to implement the Endangered Species Alert Program (ESAP)

  The ESAP provides SCE personnel with a means for identifying when they may be working in areas with the potential occurrence of legally protected plant and animal species within SCE Service Territory. Annual training is a component of the program. For each of these species within the SCE Service Territory, the ESAP Manual (SCE 2006b) includes a photograph, description, natural history information, and map showing the species' distribution in relation to SCE facilities. Should a proposed activity have the potential to conflict with a known sensitive species population, SCE's Northern Hydro Division Environmental Manager or Safety and Environmental Specialist are notified to evaluate the situation and, if needed, to coordinate with and obtain appropriate permits from regulatory agencies.

- Continue to implement the Avian Protection Program (APP)

  SCE employees are informed about the SCE Avian Protection Program (APP) through posters, written literature, wallet-sized cards, and formal training. The training discusses pertinent environmental regulations, general raptor identification, reporting procedures for the discovery of a dead raptor, protocols for how to deal with avian nests, and modifications that can be made to power line structures to lower the risk of avian electrocutions. The SCE Animal/Bird Mortality Reporting Form is used to record instances of avian mortalities in the Project vicinity. This training is conducted annually in coordination with the ESAP described above.

- Continue to implement measures to protect mule deer migration

  Measures to protect migrating mule deer in the vicinity of the Mammoth Pool Reservoir (FERC Project No. 2085) and the Eastwood Power Station (FERC Project No. 67) are currently implemented. These measures include the maintenance of fences around the Mammoth Pool Dam Spillway, the Daulton Creek Bridge, the barrel line across the Mammoth Pool Reservoir, and the implementation of road closures in the vicinity of the Eastwood Power Station (Balsam Meadows).

- Continue to implement wildlife habitat enhancement

  SCE piles or windrows brush cleared from roads, firebreaks, or under transmission lines on Project lands, within or adjacent to cleared areas. These activities provide cover and improve the habitat for quail, rabbit and other wildlife.

- Continue to protect special-status species

  SCE is required to prepare a Biological Assessment/Biological Evaluation (BA/BE) and obtain all appropriate permits or approvals prior to the construction of new Project features that may affect special-status species (SCE 2007b; Volume 4, SD-F (Books 19 and 24)).

3.1.6.3 Recreational Resources

- Continue to maintain certain recreation facilities

  SCE currently maintains several recreation facilities in the vicinity of the four Big Creek ALP Projects. SCE would continue to maintain these facilities under the Proposed Action. The following describes each existing recreation facility by Project.

  Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67)

  - Camp Edison, maintained and operated by SCE for public use, located along the western shore of Shaver Lake, provides 252 overnight camping facilities, picnic facilities for 75 families, hot and cold running water, showers, toilet and laundry facilities, disposal stations, electricity, and boat launching facilities. The Camp Edison Information Center has interpretive displays on Native Americans, native fish and wildlife, and timber programs in the Basin.

  - The Day use areas at Shaver Lake, along North Shore Roads 1 and 2, at Shaver Point off State Highway 168, and Eagle Point Boat-in Day-Use Area provide picnic tables and restroom facilities.

  - The trailhead, paved parking area (20- to 30-car capacity), and vault toilets located just off State Highway Route 168 at the entrance road to the Balsam Forebay, support year-round day-use activities.

  - The walk-in day-use area at the Balsam Forebay contains five picnic sites and vault toilets.

  - The Eastwood Overlook is located on two acres of land near Portal Powerhouse at the north end of Huntington Lake. The overlook provides an interpretive display containing signs, maps, and Project area information. The facility features several information signs about the BCS. Under the Proposed Action, SCE is recommending that Eastwood Overlook be removed from the FERC Project No. 67 Boundary and included in the FERC Project No. 2175 Boundary.

Big Creek No. 3 (FERC Project No. 120)

- The Angler Stairway provides access to the San Joaquin River and Dam 6 Forebay near Mammoth Pool Powerhouse.

3.1.6.4 Land Management

- Continue to implement the Fire Plan

  SCE maintains a Basin-Wide Fire Plan that is developed and reviewed annually in consultation with the USDA-FS. The Plan outlines the responsibilities for fire prevention and suppression during planned field activities for the duration of each declared fire season, or when ground litter and vegetation will sustain combustion, causing the spread of fire. The Plan also includes initial attack and reporting procedures that must be followed in the event of a fire in the vicinity of the Projects, or resulting from any SCE operations in the Forest. SCE will continue to implement the Fire Plan, as annually revised, during the term of the new license.

- Continue to implement the Spill Prevention Control and Countermeasure Plans

  SCE currently prepares Spill Prevention Control and Countermeasure Plans (SPCCs) to address and minimize the potential for oil spills. These plans are revised every three years, and describe procedures and available equipment for mitigating any oil spills that might occur. SCE also has specific provisions for periodic inspection of all oil-containing equipment and devices that prevent spilled oil from escaping Project buildings or grounds. In addition, all oil transfer operations follow applicable U.S. Department of Transportation (US-DOT) regulations.

  All SCE Northern Hydro Division operation and maintenance personnel receive annual training on spill prevention, control, and containment procedures. The training includes instruction in the location, operation and maintenance of equipment applicable to spill prevention and pollution control laws, rules and regulations.

3.1.6.5 Cultural Resources

- Continue to implement environmental training sessions

  SCE personnel attend environmental training sessions on a regular, and an as-needed basis. These training sessions include a review of background material, permit conditions, and instructions on how to avoid impacts on resources, including cultural resources. Project-specific meetings may also be conducted in the field on a job-specific or activity-specific basis to review appropriate management protocols (avoidance and protection measures) in environmentally or culturally sensitive areas.

3.1.6.6 Existing Measures that Apply to Multiple Resource Categories

In addition to those measures that are identified above by resource category, the following measure applies to several resource categories.

- Continue to schedule and attend an annual planning meeting with the USDA-FS

  An annual meeting is held each spring between the USDA-FS and SCE to discuss and coordinate operations and maintenance projects planned for the coming year. These meetings allow the two organizations to be aware of upcoming activities and to make sure that proper contacts and preparations are made to avoid or mitigate potential adverse effects on environmental and cultural resources.

3.1.7 New Environmental Measures

The following describes new programs, measures or facilities under the Proposed Action to enhance environmental and cultural resources in the vicinity of the four Big Creek ALP Projects. The following section provides a description of each environmental enhancement by major resource category.

3.1.7.1 Water and Aquatic Resources

- Implement new MIF and CRMF. Refer to Tables 3.1.7-1 and 3.1.7-2 for proposed flows.

  SCE will implement MIFs for aquatic habitat protection and temperature control and CRMF for maintaining and enhancing aquatic and riparian habitat.

  Infrastructure changes at 12 Project facilities are necessary to provide the new MIFs and CRMFs recommended in the Proposed Action. The location of the facilities and type of infrastructure changes include:

  - Dam 5 (FERC Project No. 67) - install a release structure and a flow measurement device;
  - Mono Creek Diversion (FERC Project No. 67) - install a release structure and a flow measurement device;
  - Mammoth Pool Dam (FERC Project No. 2085) - install a pipe, valve and a flow measurement device as part of a new release structure;
  - Bolsillo Creek Diversion (FERC Project No. 67) – install a release structure and a flow measurement device;
  - Camp 62 Creek Diversion (FERC Project No. 67) – install a release structure and a flow measurement device;
  - Chinquapin Diversion (FERC Project No. 67) – install a release structure and a flow measurement device;
  - Ross Creek Diversion (FERC Project No. 2085) – install a release structure and a flow measurement device;

- Rock Creek Diversion (FERC Project No. 2085) – install a release structure and a flow measurement device;
- Ely Creek Diversion (FERC Project No. 2175) – install a release structure and a flow measurement device;
- Balsam Creek Diversion (FERC Project No. 2175) – install a release structure and a flow measurement device; and
- Dam 4 (FERC Project No. 2175) - install a release structure and a flow measurement device.
- Dam 6 (FERC Project No. 120) - install piping and a flow measurement device.

- Decommission four small backcountry diversions and two domestic water diversions.

  SCE proposes to decommission four backcountry diversions (North and South Slide Creek diversions, Tombstone Diversion, and Crater Creek Diversion) and two domestic water diversions (Snowslide Creek Domestic Diversion and Pitman Creek Domestic Diversion). SCE has developed a Small Diversions Decommissioning Plan that describes the general approach for decommissioning the six small diversions. The Plan provides a description of: (1) the physical characteristics and location of each of the small diversions; (2) the decommissioning activities, staging areas and equipment to be used; (3) the permitting requirements; and (4) the proposed schedule. The objective of the Plan is to provide the information and preliminary details necessary for approval and issuance of required permits by the Commission and other appropriate regulatory agencies. The Small Diversions Decommissioning Plan is provided in Volume 4 (SCE 2007a; SD-G (Books 19 and 24)). Because the Tombstone Diversion and the Crater Creek Diversion are located within the John Muir Wilderness, SCE will need to obtain approval from USDA-FS to use power equipment and helicopter support.

- Implement the Fish Monitoring Plan

  The Fish Monitoring Plan presents an approach to long-term fish population trend monitoring in selected locations in Project bypass reaches and the four major ALP Project reservoirs. Monitoring of silver bioaccumulation will be conducted currently with reservoir monitoring in Mammoth Pool Reservoir and Huntington Lake. The Plan includes specifics regarding monitoring schedules and locations, survey and analytical methods, a description of any adaptive management targets, reporting, and agency consultation. The Fish Monitoring Plan is provided in Volume 4 (SCE 2007a; SD-G (Book 19).

- Implement the Temperature Monitoring and Management Plan

  The Temperature Monitoring and Management Plan includes methods to assess the effectiveness of new instream flows in selected reaches associated with the four Big Creek ALP Projects to meet stream temperature targets and thus enhance coldwater fish (trout) habitat. The Plan describes the temperature objectives for the bypass reaches, approaches for monitoring temperatures, meteorology, and instream flows, and a monitoring schedule. In specific reaches, the Plan provides for real-time monitoring and adjustment of flows to meet temperature targets, when temperature is a Project controllable factor. The Plan defines the process for assessing whether the temperature objectives for habitat enhancement have been met. The Plan also addresses approaches to protecting beneficial uses by alterations in releases, if temperature criteria are not initially met. The Temperature Monitoring and Management Plan is provided in Volume 4 (SCE 2007a; SD-G (Books 19 and 24)).

- Implement the Flow Monitoring and Reservoir Water Level Management Plan

  The Flow Monitoring Plan includes methods to monitor flow conditions in specified bypass reaches of the four Big Creek ALP Projects for compliance with License requirements, as well as monitoring of reservoir levels. The Plan includes locations of existing equipment, types of equipment to be installed, locations where additional gages will be installed, and monitoring and reporting methods and schedules. The Plan also details the type and frequency of maintenance activities, as well as equipment calibration methods and frequency. Reporting of information is addressed in this Plan. The Flow Monitoring and Reservoir Water Level Management Plan is provided in Volume 4 (SCE 2007a; Volume 4, SD-G (Book 19)).

- Implement Large Woody Debris Measures

  Large Woody Debris Measures address the management of large woody debris at the Bear Creek Diversion (FERC Project No. 67). These measures ensure that large woody debris trapped by the diversion is available for downstream mobilization during high flows. It also specifies the minimum dimensions of large woody debris, and procedures and schedule for its collection, placement, and distribution, as well as agency consultation. The language of the measure is provided in the proposed License Article, Large Wood Debris Management (SCE 2007a; Volume 4, SD-G (Book 19)).

- Implement the Sediment Management Prescriptions

  Refer to Table 3.1.7-3 for the locations where sediment management will occur. The sediment management prescriptions describe diversion operations and maintenance activities to address sediment management issues. The sediment management prescriptions outline the operational procedure including timing and duration for sediment pass through activities, physical removal of sediment from behind diversion structures, and coordination of flow releases to transport sediments from

downstream stream reaches after removal activities. Monitoring of turbidity during sediment removal activities and of sediment accumulation in pools downstream of the dams or diversion structures following sediment removal activities are also described.

- Implement the Mono Creek Channel Riparian Maintenance Flow Plan

  The objective of the Mono Creek Channel Riparian Maintenance Plan is to implement appropriate CRMF releases in Wet and Above Normal Water Years to maintain reduced accumulations of fine sediment in Mono Creek between Mono Diversion and the confluence with the South Fork San Joaquin River. The criteria in the Plan shall be used to determine which of two Wet Water Year CRMF schedules will be released for sediment control in Wet Water Years. The Mono Creek Channel Riparian Maintenance Flow Plan is provided in Volume 4 (SCE 2007a; SD-G (Book 19)).

- Implement the Channel and Riparian Maintenance (CRM) Flows for the South Fork San Joaquin River below Florence Reservoir

  The objective of the CRMF Plan is to implement appropriate releases in Wet and Above Normal Water Years at Florence Lake to provide inundation of riparian habitats in the Jackass Meadow complex to enhance the riparian community. Areal extent of inundation will be used to assess appropriate CRMFs. Other objectives of these CRMFs are to provide whitewater boating opportunities and benefit sediment transport.

- Implement the Riparian Monitoring Plan

  The Riparian Monitoring Plan includes methods to monitor the effectiveness of various CRM flow measures in enhancing riparian resources along specified stream reaches in the vicinity of the Jackass Meadow Complex along the SFSJR and Mono Creek downstream of Mono Diversion for the Big Creek Nos. 2A, 8, and Eastwood Project (FERC Project No. 67). It details the monitoring approach, methods, and schedules for each reach. The Riparian Monitoring Plan is provided in Volume 4 (SCE 2007a; SD-G (Books 19 and 24)).

3.1.7.2 Terrestrial Resources

- Continue to Protect Special-Status Species.

  SCE will continue to protect special-status species through implementation of the Special-Status Species Measure, which requires that SCE prepare a BA/BE and obtain all appropriate permits or approvals prior to the construction of new Project features that may affect special-status species. The language of the proposed measure is provided in the proposed Special-status Species License Article (SCE 2007a; Volume 4, SD-G (Book 19)).

- Implement the Bear/Human Interaction Measure

  SCE will install and maintain bear proof dumpsters at SCE's administrative offices and company housing near Big Creek Powerhouse No. 1, and at other Project facilities where food waste may be disposed or stored, as required by the proposed Bear/Human Interaction License Article (SCE 2007a; Volume 4, SD-G (Book 19)). CDFG and USDA-FS will review and approve dumpster design prior to installation. The Licensee will also implement a program to educate SCE personnel about proper food storage and garbage disposal to reduce bear/human incidents.

- Implement the Noxious Weed Training Program

  SCE personnel will receive training on noxious weed control in the vicinity of the four Big Creek ALP Projects. Specifically, the Sierra-San Joaquin Noxious Weed Alliance Field Guide to Invasive Non-Native Weeds of Mariposa, Madera, and Fresno Counties will be reviewed and provided to SCE personnel. This field guide is focused on prominent weed species in the vicinity of the Projects and provides photographs, visual characteristics, a description of each species, mechanism of spread, impacts of infestation, and important control measures.

- Implement the Northern Hydro Special-Status Species Information Program

  SCE's Northern Hydro Division will implement a Northern Hydro Special-Status Species Information Program (NHSSIP) to provide SCE personnel with a means of identifying when they may be working within an area that could support a special-status species (2006c). This Program will require the use of the Environmental Compliance Program described below and will supplement the ESAP described under existing environmental measures above. This program will include a photograph or line drawing of the species, a description, natural history information, and map showing the species' distribution in relation to SCE facilities.

- Implement the Environmental Compliance Program

  SCE will develop a compliance program that includes a process to implement specific Operations and Maintenance activities. This program will be designed to track Operations and Maintenance activities implemented, update resource information, and guide personnel in implementation of Operations and Maintenance activities in compliance with A/P measures developed for the Project. The compliance program is envisioned to consist of three components the Northern Hydroelectric Environmental Compliance Database, GIS Database, and the Compliance Process.

- Implement the Bald Eagle Management Plan

  The Bald Eagle Management Plan was developed to address management of the bald eagle during ongoing maintenance and operation of the four Big Creek ALP Projects. The Plan includes monitoring the location of bald eagles and their habitat

within the Project vicinities; potential effects/enhancements of ongoing operations and maintenance activities; bald eagle avoidance and protection measures to be implemented for the term of the license; resource monitoring and reporting; and agency consultation. The Bald Eagle Management Plan is provided in Volume 4 (SCE 2007a; SD-G (Books 19 and 24)).

- Implement the Valley Elderberry Longhorn Beetle (VELB) Management Plan

  The VELB Management Plan was developed to address VELB management during ongoing operations and maintenance of Project facilities, roads, trails and recreation facilities in the vicinity of the four Big Creek ALP Projects. The Plan includes the location of VELB and their habitat within Project vicinities; a summary of management activities that could potentially impact VELB or their habitat (e.g., vegetation control and road maintenance); measures for the avoidance and protection of VELB and their habitat; a description of impacts to VELB habitat during the term of the license; proposed mitigation measures (i.e., planting of seedlings); and mitigation monitoring and reporting requirements. The Plan also includes a description of a VELB training program for SCE personnel conducting maintenance and operation activities in the vicinity of VELB or their habitat. The Valley Elderberry Longhorn Beetle Management Plan is provided in Volume 4 (SCE 2007a; SD-G (Books 19 and 24)).

- Implement the Vegetation and Integrated Pest Management Plan

  The Vegetation and Integrated Pest Management Plan was developed to address the management of vegetation, including noxious weeds, and pesticides (i.e., herbicides and pesticides) as part of ongoing maintenance and operation of the four Big Creek ALP Projects. The Plan describes vegetation management and pesticide use that occurs in Project vicinities; the location of sensitive biological resources, noxious weeds and invasive ornamentals potentially affected or introduced during vegetation management; appropriate avoidance and protection measures for biological resources; measures to prevent the spread or introduction of noxious weeds and invasive ornamentals; erosion control and re-vegetation measures; and resource monitoring and reporting requirements. The Vegetation and Integrated Pest Management Plan is provided in Volume 4 (SCE 2007a; SD-G (Book 19)).

- Implement the Special-Status Bat Species Measure

  The Special-Status Bat Species Measure requires that SCE consult with CDFG and USDA-FS prior to conducting any non-routine maintenance activities in areas known to support maternal or roosting bat species and to implement, if necessary, appropriate avoidance and protection measures to minimize the disturbance of these populations. The rationale for and specific language for this measure is provided in the proposed Special-Status Bat Species License Article (SCE 2007a; Volume 4, SD-G (Book 19)).

- Implement Mule Deer Measures

  SCE will continue to implement measures to protect mule deer in the vicinity of the Mammoth Pool Reservoir and Eastwood Power Station. These include measures that SCE currently implements and new measures such as monitoring debris build-up at Mammoth Pool Reservoir. The rationale and specific language for this measure is provided in the proposed Mule Deer License Article (SCE 2007a; Volume 4, SD-G (Book 19)).

- Implement Measures for New Project Facilities

  SCE will complete focused special-status plant surveys, Native American plant species of special concern, VELB surveys, and noxious weeds and invasive plant species surveys in the vicinity of the newly identified Project facilities including roads, and trails. Surveys will follow agency and stakeholder approved survey methods implemented for the four Big Creek ALP projects as described in the Technical Study Plan Reports. If special-status resources, noxious weeds, or invasive ornamental plant species are identified at or adjacent to these Project facilities, roads, and trails, SCE will implement avoidance and protection measures as defined in the Vegetation and Integrated Pest Management Plan, Historic Properties Management Plan, and Valley Elderberry Longhorn Beetle Management Plan.

- Protection of Special-status Species at New Helicopter Landing Sites

  SCE proposes to develop five new helicopter landing sites. Two sites are located in the Mammoth Pool Project vicinity (SJR above Shakeflat Creek and Mammoth Pool Dam) and three sites are in the Big Creek Nos. 2A, 8 and Eastwood Project vicinity (South Fork San Joaquin River below Hooper, Mono Creek at diversion, and Mono Creek below Lake T. A. Edison). The development of these site will require removal of several trees and shrubs. Prior to development of these sites, SCE will: (1) complete focused surveys for special-status plants, noxious weeds, and invasive plant species; and (2) conduct clearance surveys for bald eagle nests and/or other active raptor nests. SCE will locate the landing pads to avoid effects to any nest trees, and site development activities (i.e., tree removal) will be scheduled to avoid disturbance of any active raptor nests identified during surveys.

3.1.7.3 Recreational Resources

- Implement the Recreation Management Plan

  The Recreation Management Plan addresses the management of developed recreation opportunities in the vicinity of the four Big Creek ALP Projects. The Plan describes recreation facility operation and maintenance responsibilities, rehabilitation of recreation facilities, recreation enhancements, interpretation programs, reservoir recreation, fish stocking, and whitewater boating. Each of the

Recreation Management Plan components are summarized below. The Recreation Management Plan is provided in Volume 4 (SCE 2007a; SD-G (Books 19 and 24)).

Periodic Review and Reporting: At least once every six years, SCE shall complete a recreational use and facilities condition survey at the sites listed in the Plan. The survey will be designed to determine trends of use, the number of days parking capacity is met or exceeded, and whether resource damage is occurring. SCE will use Forest Service data when available. When the data indicate a need for increased campground facilities, SCE and the Forest Service will address the need through this periodic Plan review process.

The report will also provide graphs and exceedence tables summarizing water surface elevations at Huntington Lake, whitewater boating opportunity days provided by SCE through pre-spill release flows below Mammoth Pool Reservoir (Tied-for-First Reach) and CRMF releases below Florence Lake (Florence Run), and dates when Kaiser Pass Road opened to provide public vehicular traffic access into the backcountry for non-winter recreational use.

Operation and Maintenance of Recreation Facilities. SCE will be responsible for the operation and maintenance of their Camp Edison facilities and Day-Use areas at Shaver Lake and the Day-Use area near Balsam Forebay. The USDA-FS will be responsible for the maintenance of recreation facilities that they currently operate in the vicinity of the four Big Creek ALP Projects.

Recreation Facility Rehabilitation. SCE will be responsible for the full cost for major rehabilitation of existing recreation facilities listed in Table 3-1.7-4. SCE will be responsible for performing all needed rehabilitation activities through the provision of necessary personnel, equipment, materials, and management. SCE will be responsible to replace/rehabilitate recreation features currently existing at the recreation facilities. A list of these recreation facilities, associated features and the rehabilitation schedule is provided in the Recreation Management Plan (SCE 2007a; Volume 4, SD-G (Books 19 and 24)).

Recreation Enhancements. SCE will be responsible for the full cost of developing the recreational enhancements identified below. SCE will be responsible for scheduling and/or performing all needed activities including the provision of necessary personnel, equipment requirements, materials purchase and management oversight. These recreational enhancement projects include:

- Big Creek Nos. 1 and 2 (FERC Project No. 2175)
    - Develop a day-use area adjacent to Dam No. 3 at Huntington Lake. This will include a parking area, a trail from the parking area to Dam 3, a toilet, three picnic tables, and a new gate to prevent parking on Dam 3. Two disabled parking spots will be designated at the north end of the dam.
    - Develop a handicapped accessible fishing location at Huntington Lake.

- Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67)
    - Develop a handicapped accessible fishing location at South Fork San Joaquin River near Jackass Meadows Campground.
    - Develop a handicapped loading facility at the Florence Lake Boat Ramp.

Interpretive. SCE will design and install up to thirteen interpretative display exhibits (kiosks) at various locations in the vicinity of the Big Creek ALP Projects. The kiosks will contain two display panels approximately 24" by 36" in size presenting media to educate the public on cultural, historical, pre-historic, biological and recreation resources in the Big Creek area. SCE will consult with the USDA-FS and the Big Creek Heritage Advisory Committee (as defined in the Historic Properties Management Plan (HPMP)) regarding the design, content, and placement of the interpretative display panels/kiosks (SCE 2005; Volume 4, SD-I (Book 27)).

Reservoir Recreation. SCE manages its reservoir WSE to be consistent with the primary purpose of the reservoirs for hydro generation, existing water rights, contracts, and/or licenses associated with the reservoirs. SCE will provide year-round daily average reservoir elevation information for reservoir surface elevations to the public via the Internet or other appropriate technology. SCE will make a good faith effort to support reservoir-based recreation through the maintenance of reservoir WSE at:

- Huntington Lake (FERC Project No. 2175)
- Florence Lake and Shaver Lake (FERC Project No. 67)
- Mammoth Pool Reservoir (FERC Project No. 2085)

Fish Stocking. In order to enhance angling opportunities on Project reservoirs and stream reaches in the vicinity of the Project, SCE will match equally the California Department of Fish and Game (CDFG) stocking of Project-related reservoirs and bypass stream reaches below Project diversions and upstream of Redinger Lake, up to the following amounts:

- Rainbow Trout:
    - Fingerlings – up to 20,000 per year
    - Catchables – up to 60,000 per year
    - Subcatchables – up to 40,000 per year
- Kokanee:
    - Fingerlings – up to 30,000 per year

Streamflow Information. SCE will provide streamflow information to the public via the Internet in a machine-readable format or other appropriate publicly accessible technology. SCE will provide year-round hourly flow data for the following stream reaches:

- South Fork San Joaquin River below Florence Dam (FERC Project No. 2175)
- San Joaquin River below Mammoth Pool Reservoir (FERC Project No. 2175)
- San Joaquin River below Dam 6 (FERC Project No. 2175)
- Stevenson Creek below Shaver Dam (FERC Project No. 2175)
- Mono Creek between Vermilion Valley Dam and Mono Diversion (FERC Project No. 2085)

Whitewater Recreation. Whitewater boating opportunities in the Project vicinities will be enhanced by the dissemination of real-time flow information and of pre-spill flow releases in wet years, and above normal years at Mammoth Pool Reservoir.

SCE will provide pre-spill whitewater flow releases below Mammoth Pool in Wet and Above Normal Years. Upon request of the American Whitewater Association or regional whitewater boating representatives after March 15th, SCE will discuss the anticipated water run-off conditions in relation to pre-spill releases below Mammoth Pool Dam. If the water-year type is determined to be a wet or above normal water year, pre-spill releases will be proposed.

In addition, SCE will attempt to provide flows sufficient in timing and magnitude for whitewater boating opportunities in the South Fork San Joaquin River in wet and Above Normal Water Years. SCE will attempt to provide such flows during the descending portion of the channel and riparian maintenance flow (CRMF) release to the extent within their control and consistent with the requirements of the Channel and Riparian Maintenance (CRM) Flows for the South Fork San Joaquin River below Florence Reservoir (SCE 2007a; Volume 4, SD-G,(Book 19)).

These enhancements will enable whitewater boaters to take better advantage of existing whitewater boating opportunity days, as well as provide for an increase in the number of annual whitewater boating opportunity days.

3.1.7.4 Land Resources

- Implement the Visual Resources Plan

The Visual Resources Plan includes measures to reduce the visual contrast of Mammoth Pool Penstocks (FERC Project No. 2085), Big Creek No.1 Penstock (FERC Project 2175), Big Creek No. 3 Penstock (FERC Project No. 120), Mono-Bear Siphon Combined Flow Line (FERC Project No. 67) and Big Creek No. 1 Switchyard (FERC Project No. 2175). The visual contrast of penstocks will be

reduced by painting them with a color that blends in with the surrounding landscape, consistent with the historical nature of the facilities. This color will be selected in consultation with the USDA-FS using a testing and evaluation process described in the Visual Resources Plan (SCE 2007a; Volume 4, SD-G (Books 19 and 24)). Penstocks will be painted during the routine painting cycle.

The Visual Resources Plan also describes measures that will be implemented to reduce the visual contrast of the Big Creek No. 1 Switchyard as viewed along Huntington Lake Road. This includes a management prescription to promote the growth of existing trees along the road, to more effectively screen the view of the switchyard.

- Implement the Transportation System Management Plan

  The Transportation System Management Plan provides a description of the transportation system management issues and requirements. The Plan describes the transportation system used by SCE to access the four Big Creek ALP Projects, and identifies resource issues associated with road and trail access and maintenance activities. The Plan also includes appropriate measures to address these issues, including rehabilitation, road use/traffic control measures, measures to protect environmental and cultural resources, and annual consultation with appropriate regulatory agencies. The Transportation System Management Plan is provided in Volume 4 (SCE 2007a; Volume 4, SD-G (Books 19 and 24)).

3.1.7.5 Cultural Resources

- Implement a Cultural Resources Awareness Program

  A Cultural Resources Awareness Program will be conducted on an annual basis in conjunction with the ESAP described in Section 3.1.6.2. The training will be provided to SCE personnel working in the vicinity of the four Big Creek ALP Projects. The cultural resources component will include procedures for implementation of the HPMP and a section on awareness of Native American traditional cultural values.

- Implement the Historical Properties Management Plan (HPMP)

  The HPMP describes a program to preserve and manage Historic Properties and other important cultural resources—sites, places and resources identified by Native Americans and other stakeholders as having important historic or heritage values that do not otherwise meet the National Register criteria for Historic Properties—in the Area of Potential Effects (APE) for the four Big Creek ALP Projects. The Plan describes the regulatory context for the Plan development; defines Big Creek ALP historic preservation goals and management objectives; identifies historic properties in the Project vicinities and potential Project impacts on these properties; provides guidelines for the management of these properties and important cultural resources; and outlines the implementation and resource monitoring schedule for the Plan. The

draft Historic Properties Management Plan is provided in Volume 4 (SCE 2005; SD-I (Book 27)).

- Schedule and attend an annual meeting with interested Native Americans

  SCE will schedule and attend an annual consultation meeting with interested Native Americans. The focus of this meeting will be to inform the Native Americans of proposed vegetation management (e.g., herbicide use), recreation rehabilitation, and road maintenance activities, including the location and time of year the activities are to be implemented.

3.1.8 Non-FERC Settlement Agreement Measures

As part of the Big Creek ALP stakeholder settlement negotiations, the signatories to the Settlement Agreement have agreed upon a number of terms in Appendix B to the Settlement Agreement. These "Non-FERC Settlement Terms" are not to be included as license conditions in Commission-issued licenses for the Projects. Instead, the signatories prefer that the terms be enforced as a contract among the signatories for a number of reasons, including that some of the terms are unrelated to any Project impacts and are inconsistent with the Commission's guidance regarding settlement agreements in hydroelectric licensing proceedings (Policy Statement on Hydropower Licensing Settlements, issued September 21, 2006). Although the non-FERC settlement terms are not related to the operation and maintenance of the Project, the terms will provide a cumulative benefit to environmental and cultural resources in the vicinity of the ALP Projects and are therefore discussed in Section 5.3 Cumulative Effects of this APDEA. The non-FERC settlement terms are described in detail in the Big Creek ALP Settlement Agreement Appendix B, which is provided in Volume 4 (SCE 2007c; SD-H (Book 20)). The Non-FERC Settlement terms are listed by resource area as follows:

- Water and Aquatic Resources
  - Gravel Augmentation - below Mammoth Pool Dam
- Cultural Resources
  - Additions to the Cultural and Environmental Awareness Program for SCE Northern Hydro Employees
  - Annotated Bibliography of cultural resource reports from SCE Projects within Big Creek Area
  - Access to SCE Lands for Plant Gathering Purposes
  - Lands for Reburial
  - Improve Pedestrian Access and Protection of Cultural Resource at Mono Hot Springs

- Jackass Meadow Sedge Bed Restoration
- Native American Advisory Group
- Native American Use Area near Shaver Lake
- Native American Scholarship Fund
- Plant Gathering and Tending Garden
- Support to Sierra Mono Museum
- Training of Native American Monitors

- Land Management Resources
  - Provide commensurate share funding to the Forest Service for SCE use of non-Project roads
  - Road Rehabilitation on select Non-Project Forest Service Roads
  - SCE maintenance of select Forest Service Non- Project roads
  - Transportation Signage Fund
- Recreation Resources
  - Provide annual funding to the Forest Service for asset management and maintenance of concentrated use areas.
  - Provide a boat and trailer to the Forest Service for the management of the dispersed concentrated use recreation areas
  - Provide annual funding to the Forest Service for minor rehabilitation activities at the Forest Service owned and operated recreation facilities
  - Provide annual funding to the Forest Service for the administration of interpretive programs
  - Share costs for a Portal Campground water system
  - Provide funding to the Fresno County Sheriffs Department for the purchase of a Snow CAT.
  - Providing funding to the Huntington Lake Association for repairs to the Billy Creek Museum.
  - Provide assistance to the Huntington Lake Association to support boat dock improvements.

- Provide permanent outdoor housing to the Huntington Lake Big Creek Historical Conservancy for housing of a Bull Mack Truck, and a section of Ward Tunnel Pipe

- Provide funding to the Huntington Lake Big Creek Historical Conservancy for educational and interpretive programs.

- Provide funding to the Huntington Lake Volunteer Fire Department to support the purchase of a fire tender truck.

- Provide a one time donation to the San Joaquin River Trail Council to support the San Joaquin River Trail.

- Provide a one time donation to the Shaver Crossing Railroad Group to support the Shaver Crossing Railroad Station Museum

3.2 CALIFORNIA DEPARTMENT OF FISH AND GAME ALTERNATIVE

On October 17, 2005 the California Department of Fish and Game (CDFG) filed a letter (CDFG 2005) with the Commission that provided recommended measures for the protection of the fish and wildlife resources encompassed within and downstream of the four Big Creek ALP Projects. The CDFG Alternative provides recommendations for both aquatic and terrestrial resources as comments to the Settlement Agreement proposal developed by the Big Creek Collaborative. A copy of the CDFG letter is provided in Attachment A. SCE met with CDFG on June 15, 2006 to discuss and clarify portions of CDFG's letter (SCE 2006a). Where appropriate, those clarifications are incorporated into the CDFG Alternative described in this APDEA. The recommendations contained in the CDFG Alternative for aquatic and terrestrial resources are briefly summarized as follows:

- Condition the new licenses for the four Big Creek ALP Projects to require a study of how the Big Creek ALP Projects may affect future anadromous fish resources in the San Joaquin River downstream of Friant Dam and how they may be managed to contribute to the benefit of anadromous fish restoration efforts. Include a license re-opener condition that would allow consideration and adoption of additional or revised license conditions or articles to support anadromous fish restoration in the San Joaquin River downstream of Friant Dam.

- Development of NEPA documentation that relies on US Bureau of Reclamation modeling and other studies that can be used to address the direct, indirect, and cumulative impacts of the continued operation of the Project reservoirs upon future downstream anadromous fish populations.

- Implement recommended instream flows for 23 stream reaches that are under the Project's operational control. These instream flow recommendations are summarized in Table 3.1.7-1.

- Conduct a monitoring program, designed to identify trends in the levels and source(s) of silver accumulation in fish tissue as well as organisms regularly consumed by fish (crayfish or macroinvertebrates) in the Mammoth Pool area and other Project reservoirs. As discussed with CDFG (SCE 2006a), these studies would be carried out in conjunction with reservoir fish monitoring.

- Balance releases from Project reservoirs with the need to maintain reservoir levels for recreation. Concern is expressed for the timing and nature of minimum pool conditions.

- Develop a reservoir fish monitoring program to monitor fish population trends and to determine if changes in reservoir operation under the new Project licenses result in impacts to aquatic resources in reservoirs.

- Installation of fish screens to exclude fish and wildlife from the drop tube intakes on Project diversions, primarily the diversions that supply water to the Ward Tunnel. Provide compensation for entrainment losses.

- Use more current estimates, using more recent information, of reference fish densities for comparison to those in the Project area as a basis for environmental documentation or evaluation.

- Reimburse the CDFG for the ongoing cost of fish stocking, along with efforts for fish production and monitoring. CDFG estimates this cost to be in the range of $300,000 per year.

- Update the 1600 Stream Alteration Maintenance Agreement for Sediment Maintenance to ensure that adequate fish and wildlife protection is implemented during sediment management activities at Project facilities. Sediment management plans or measures approved by the ALP Collaborative may be attached.

- Continue to implement Mammoth Pool Deer Protection measures included in the present FERC License, with the exception of the construction of deer access ramps near the Mammoth Pool Spillway. Measures to be continued include annual photo documentation of Mammoth Pool to identify the presence of debris and ensure any debris is removed in a timely manner to protect deer migration across the reservoir.

- Implement a Wildlife Mortality Mitigation Program to offset ongoing wildlife mortality associated as a result of Project reservoir operations and Project associated traffic (wildlife loss on Project roads due to increases in recreational use). CDFG recommends that SCE provide funding to support the Wildlife Mortality Mitigation Program on an ongoing basis during the term of the Project license.

- Install and maintain bear proof dumpsters within the town of Big Creek and at all facilities in and adjacent to the FERC Project Area for which SCE is responsible for the term of the new licenses.

- Continued cooperation by the Licensee in granting access of CDFG personnel to restricted areas with in the Project

3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the four Big Creek ALP Projects would continue to be operated and maintained under the terms and conditions in the existing licenses. Changes in Project facilities, Project boundaries, and new environmental measures described under the Proposed Action would not be implemented. In the APDEA, the No Action Alternative is used to establish baseline environmental conditions for comparison with other alternatives.

3.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

As part of the analysis of alternatives, several licensing alternatives were considered but eliminated from detailed study in the PDEA. These alternatives include:

- Federal Government Takeover
- Issuing Non-power License(s)
- Retirement of the Project(s)

A summary of the review of each of these alternatives for the four Big Creek ALP Projects is given in the following subsections.

3.4.1 Federal Government Takeover

Federal takeover of the Project(s) was not considered to be a reasonable alternative. Federal takeover of the Project(s) would require several actions including congressional approval and assignment of the Project(s) to a specific Federal agency, which would have the interest and staff to operate the Project(s).

There is no evidence showing that a federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate and no Federal agency has expressed an interest in operating the Project(s). Therefore, this alternative was deemed unreasonable and eliminated from further detailed study.

3.4.2 Issuing a Non-Power License(s)

Issuance of a non-power license for the Project(s) was not considered to be a reasonable alternative. A non-power license is a temporary license that the Commission would terminate whenever it determines that another government agency

is authorized and willing to assume regulatory authority and supervision over the lands and facilities covered by the non-power license.

There is no evidence that a government agency has suggested a desire or ability to take over the Project(s). No other party has sought a non-power license. Further, The Project's facilities are fully capable of continuing to generate under SCE. Therefore, this alternative was deemed unreasonable, and eliminated from further detailed study.

3.4.3 Retirement of Project(s)

Retirement of the Project(s) was not considered to be a reasonable alternative. Project retirement would require the Commission to deny SCE's Application for New License(s) and require surrender and termination of the existing license(s) along with implementation of any associated conditions. The Project(s) would no longer be authorized to generate power.

Retirement of the Project(s) would result in substantial loss of generation; substantial costs associated with removal of Project facilities; and lost revenue for the local communities associated with ongoing operations and maintenance of the Project and decreases in recreational users currently using Project reservoirs. If Project dams were left in place to maintain recreation opportunities, the Project dams and reservoirs would have to be operated and maintained by some unknown entity. No government agency, tribal interest, non-government organization, or individual has recommended retirement of any of the Projects. Therefore, this alternative was found not to be a practical or reasonable alternative and was eliminated from further detailed study.

TABLES

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Mammoth Pool (FERC Project No. 2085)

Dams and Diversions

Large Dams

Mammoth Pool Dam
Mammoth Pool Spillway

Small Diversions

Rock Creek
Ross Creek

Power Generation

Mammoth Pool PH
Mammoth Pool Fish Water Generator

Gaging Stations

Streams

Mammoth Pool Fish Water Generator
San Joaquin River above Shakeflat Creek (with cable crossing)
Rock Creek Below Diversion[1]
Ross Creek Below Diversion[1]

Reservoir

Mammoth Pool Dam
Mammoth Pool PH

Water Conveyance

Mammoth Pool Powerhouse

Intake Gate House
Adit Portals 1 & 2 at Shakeflat Creek
Mammoth Tunnel
Rock Creek Diversion Piping & Borehole
Ross Creek Diversion Piping & Borehole
Surge Chamber, Rock Trap
Rock Trap Flushing Channel
Valve House
Penstocks

Fishwater Generator

Mammoth Pool Diversion Tunnel

HB Valves

Mammoth Pool Reservoir

Cabins

Mammoth Pool Reservoir Maintenance Cabin

Power Transmission Lines

MPPH - BC3 220KV

Helicopter Landing Sites

Mammoth Pool Dam
San Joaquin River above Shakeflat Creek

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Big Creek Nos. 1 and 2 (FERC Project No. 2175)

Dams and Diversions

Large Dams

Huntington Lake Dams 1, 2, 3, & 3a

Moderate Diversion Dams

Dam 4

Small Diversions

Balsam Creek
Ely Creek
Adit 8 Creek

Power Generation

Big Creek PH No. 1
Big Creek PH No. 2

Gaging Stations

Streams

Big Creek below Huntington Lake at Dam 1
Balsam Creek at Diversion Dam
Ely Creek at Diversion Dam
Big Creek Below Dam 4[1]
Ely Creek below Diversion Dam[1]
Balsam Creek below diversion to Big Creek[1]

Reservoir

Huntington Dam
Dam 4

Powerhouse

Big Creek PH No.1
Big Creek PH No.2

Water Conveyance

Powerhouse No. 1

Intake Gate House at Huntington Lake - Dam 1
Tunnel No. 1
Incline Adit
Upper 84" Valve House below Huntington Lake
Upper 60" Valve House below Huntington Lake
60" & 84" Flowlines below Huntington Lake
Lower 84" Valve House at top of PH No.1 Penstock
Lower 60" Valve House at top of PH No.1 Penstock
42" Valve House at top of PH No.1 Penstock
Vent Stacks
Penstocks

Powerhouse No. 2

Inlet Structure at Dam 4
Tunnel No. 2
Adit 1, Tunnel 2
Adit 2, Tunnel 2
Adit 3, Tunnel 2
Adit 4, Tunnel 2
Adit 5, Tunnel 2
Adit 6, Tunnel 2

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Big Creek Nos. 1 and 2 (FERC Project No. 2175) (continued)

Water Conveyance (continued)

Powerhouse No. 2 (continued)

Adit 7, Tunnel 2
Adit 7&1/2, Tunnel 2
Adit 8, Tunnel 2
Adit 7&1/2, Leakage Weir
Shoo fly Piping & Splashgate Structure (Adit 8/Shoofly Diversion)
Diversion Shaft, Bulkhead and Drain Valve at Adit 8
Balsam Creek Diversion Piping (Adit 3)
Ely Creek Diversion Piping (Adit 6)
Rock Trap/Surge Chamber (9' Gate House) on the railroad grade
42" Valve House and valves below railroad grade
Drain Piping & Valves (10" & 24") from Surge Chamber, below railroad
Vent Stacks below railroad grade
Penstocks

Huntington-Pitman-Shaver

Inlet Structure & Gate 1A and 1B at Dam 2 (10' Gate House)

Adit 8 Creek

Shoo fly Complex

Weather Stations

Big Creek No. 1
Huntington Lake

Buildings/Camps

SCE Administrative Offices and Company Housing

Storage Yards

Big Creek PH No.1

Utilities

Water Supply/Treatment

Big Creek PH No.1

Domestic Water Diversions

Scott Lake

Sewage Treatment

Big Creek PH No.1 Community

Fuel - Gasoline & Diesel

Big Creek No.1 Garage

Propane

Big Creek PH No.1 Automotive Shop

Project Power Lines Less Than 33KV

Musick 7KV

Helicopter Landing Sites

Hodges (Big Creek Heliport)

Dams and Diversions

Large Dams

Florence Lake
Shaver Lake

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)

Dams and Diversions (continued)

Moderate Diversion Dams

Bear Creek Diversion
Mono Creek Diversion
Pitman Creek
Balsam Forebay
Dam 5

Small Diversions

Hooper Creek
Tombstone Creek[2]
North Slide Creek[2]
South Slide Creek[2]
Crater Creek[2]
Chinquapin Creek
Camp 62 Creek
Bolsillo Creek

Power Generation

Big Creek PH No. 2A
Big Creek PH No. 8
Eastwood Power Station

Gaging Stations

Streams

Bear Creek below Diversion Dam
Bear Creek Conduit at Diversion Dam
Bear Creek upstream of Diversion Dam (with cable crossing)
Big Creek below Dam 5 (with cable crossing)
Bolsillo Creek above Intake
Bolsillo Creek below Diversion Dam
Camp 62 Creek below Diversion Dam
Chinquapin Creek below Diversion Dam
Hooper Creek below Diversion Dam
Huntington-Shaver Conduit gate 2 release
Middle Fork Balsam Creek below Balsam Meadows Forebay
Mono Creek below Diversion Dam
Mono Creek Conduit at Diversion Dam
Mono-Bear Conduit (flow meter near Camp 62)
North Fork Stevenson Creek at Perimeter Rd.
Pitman Creek above Diversion (total flow)
Pitman Creek below Diversion (minimum release)
South Fork San Joaquin River below Hooper Creek
South Fork San Joaquin River above Hooper Creek (with cable crossing)
Stevenson Creek below Shaver Lake
Ward Tunnel at Intake
Camp 62 Creek at Diversion Dam
Chinquapin Creek at Diversion Dam
Crater Creek Diversion Ditch near Florence Lake[2]
Crater Creek below Diversion Dam[2]

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)

Gaging Stations (continued)

Streams (continued)

North Slide Creek below Diversion Dam[2]
South Slide Creek below Diversion Dam[2]
Tombstone Creek below Diversion Dam[2]
South Fork San Joaquin River near Florence Lake

Reservoir

Florence Dam
Mono Dam
Shaver Dam
Dam 5

Powerhouse

Big Creek PH No.2A
Big Creek PH No.8
Eastwood Power Station

Water Conveyance

Powerhouse No. 2A

Intake Gate House at Shaver Lake
Tunnel No. 5
Adit 1, Tunnel 5
Adit 2, "Shoo fly", Tunnel 5
Surge Chamber, Rock Trap
102" Valve House
Penstocks

Powerhouse No. 8

Intake structure at Dam 5
Tunnel No. 8
Adit 1, Tunnel 8
Surge Chamber - includes trash drain and penstocks valves
Penstocks

Eastwood Power Station

Inlet Structure (Gate 4)
Power Tunnel
Surge Chamber
Tailrace Tunnel

Ward Tunnel

Inlet Structure at Florence Lake
Gate House at Florence Lake
Ward Tunnel
Minimum Pool Weir
Chinquapin Creek Borehole
Camp 62 Adit
Camp 62 Creek Borehole
Bolsillo Creek Borehole

Mono-Bear Siphon

Bear Inlet Structure at Bear Forebay
Bear Tunnel
Bear Adit

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)

Water Conveyance (continued)

Mono-Bear Siphon (continued)

- Bear Flowline
- Mono Inlet Structure at Mono Forebay
- Mono Tunnel
- Mono Flow Line
- Combined Flow Line (siphon)
- Camp 62 Adit Valving

Huntington-Pitman-Shaver

- Steel Conduit with Air Vents
- Siphon w 4" and 10" Drain Valves
- Vent Valve House
- Tunnel No. 7
- Tunnel No. 7 Vent
- Pitman Diversion Shaft
- Camp 72 Adit
- Diversion Tunnel from Tunnel 7 to Gate 3 at Balsam Meadow Forebay
- Diversion Tunnel Vent
- Gate 3 Outlet to Balsam Forebay
- Gate 2 Outlet to NF Stevenson Creek

Tombstone

- Tombstone Creek Diversion Piping[2]

Hooper

- Hooper Diversion Piping to Florence Lake
- North Slide Creek Diversion Piping[2]
- South Slide Creek Diversion Piping[2]

Diversion Channels

- Crater Creek[2]

HB Valves

- Shaver Lake

Weather Stations

- Florence Lake
- Kaiser Ridge/Mt Givens
- Shaver Lake

Cabins

- Camp 62
- Florence Lake Relief

Buildings/Camps

- Florence Work Camp
- Big Creek PH No. 8 Facilities

Storage Yards

- Florence Lake Work Camp
- Camp 62
- Big Creek PH No.2 & PH No.2A
- Eastwood School Site

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)

Utilities

Water Supply/Treatment
Camp Edison
Florence Work Camp

Fuel - Gasoline & Diesel
Big Creek PH No.8
Camp 62
Florence Work Camp

Propane
Big Creek PH No.8
Florence Work Camp - Generator, Heating

Project Power Lines Less Than 33KV
Jumbo 12KV
Pitman 33KV (to diversion)

Power Transmission Lines
EPS - BC1 220KV

Switchyards
Eastwood Switchyard

Helicopter Landing Sites
Mt. Givens Telecom Site
Bear Creek Diversion
Camp 62 at Junction of Kaiser Pass Road
Eastwood School
Pitman Creek at Diversion
Florence Lake Dam
Florence Lake Camp
Florence Lake Gaging Station
South Fork San Joaquin River Florence Spill Station
Hooper Creek at Diversion
South Fork San Joaquin River below Hooper[1]
Mono Creek at Diversion[1]
Mono Creek below Lake T.A. Edison[1]
Tiffany Pines at Camp Edison
Summit at Shaver Hill

Table 3.1.2-1. List of Existing and Proposed Project Facilities.

Big Creek No. 3 (FERC Project No. 120)

Dams and Diversions

Moderate Diversion Dams

Dam 6

Power Generation

Big Creek PH No. 3

Gaging Stations

Streams

San Joaquin River above Stevenson Creek (at dam 6)

Powerhouse

Big Creek PH No.3

Water Conveyance

Powerhouse No. 3

Intake Gate House at Dam 6
Tunnel No. 3
Adit 1, Tunnel 3
Adit 2, Tunnel 3
Adit 3, Tunnel 3
Surge Chamber, Rock/Sand Trap
Rock/Sand Trap Drain Piping & Valves
Rock Trap Flushing Channel
Manifold Structure
Valve House
Penstocks

Buildings/Camps

Big Creek PH No.3 Facilities

Storage Yards

Big Creek PH No.3

Helicopter Landing Sites

San Joaquin River above Shakeflat Creek[1]
Mammoth Pool Dam[1]

Utilities

Water Supply/Treatment

Big Creek PH No.3

Fuel - Gasoline & Diesel

Big Creek PH No.3

Project Power Lines Less Than 33 KV

Manifold 2.4 KV

[1]New facility recommended under the Proposed Action
[2]Recommended for decommissioning under the Project Action

Table 3.1.2-2. List of Reservoirs, Forebays and Diversion Pools Associated with the Four Big Creek ALP Projects.

Project Feature
Mammoth Pool, FERC Project No. 2085
Reservoirs, Forebays, and Diversion Pools
Large Reservoir
Mammoth Pool Reservoir
Big Creek Nos. 1&2, FERC Project No. 2175
Reservoirs, Forebays, and Diversion Pools
Large Reservoir
Huntington Lake
Moderate Forebays or Diversion Pools
Dam 4 Forebay
Big Creek Nos. 2A, 8 & Eastwood, FERC Project No. 67
Reservoirs, Forebays, and Diversion Pools
Large Reservoir
Florence Lake
Shaver Lake
Moderate Forebays or Diversion Pools
Bear Diversion Pool
Mono Diversion Pool
Hooper Diversion Pool
Pitman Diversion Pool
Balsam Forebay
Dam 5 Forebay
Big Creek No. 3, FERC Project No. 120
Reservoirs, Forebays, and Diversion Pools
Moderate Forebays or Diversion Pools
Dam 6 Forebay

Table 3.1.2-3. List of Project Roads and Trails.

SCE Map No.	SCE Road Name/Description	USDA-FS Road No.
Mammoth Pool Project (FERC No. 2085)		
Roads		
6	Mammoth Pool Fishwater Generator access road from 6S25, Mammoth Pool Road, to base of Mammoth Pool Dam	06S025G
80	Access road from 8S03 to Mammoth Pool penstock	08S003B
79	Access road to Mammoth Pool Transmission Line from 8S03	08S003C
144	8S03CA, spur road to Mammoth Pool Transmission Line	08S003CA
145	Access road to Mammoth Pool Transmission Line from 8S03C	08S003CB
146	Access road to Mammoth Pool Transmission Line from 8S03C	08S003CC
78	Access road from 8S03 to Mammoth Pool Powerhouse surge chamber	08S003D
213	8S44, Mammoth Pool Transmission Line access road	08S044
37	8S44Y, Mammoth Pool Transmission Line access road from gate near 8S03 to 9S42	08S044Y
138	8S44YA, Mammoth Pool Transmission Line access road	08S044YA
136	8S44YB, Mammoth Pool Transmission Line access road	08S044YB
18	9S42, Mammoth Pool Powerhouse Transmission Line access road from gate near County Road 225, Italian Bar Road, to 8S44	09S042
135	Access road to Mammoth Pool Transmission Line from 9S42	09S042A
102	7S47B Access road to Rock Creek Tunnel Muck Pile	07S047B
33	8S03 (from Powerhouse No. 8 to Mammoth Pool Powerhouse)	08S003(02)
30	6S25, Mammoth Pool Road, from 7S20, Shake Flat Creek access, to end at east abutment	06S025(03)
164	6S25DA, spur to Windy Point Picnic Area from 6S25D	06S025DA
Trail		
75	Trail to San Joaquin River Gage above Shakeflat Creek	27E05
Big Creek Nos. 1 and 2 Project (FERC No. 2175)		
Roads		
21	8S05, Canyon Road (from Huntington Lake Road to Powerhouse No. 2 and 8S05E)	08S005(02)
81	Powerhouse No.2 access road from Canyon Road	08S005C
160	Access to Big Creek No. 2 switchyard	08S005CA
16	Old housing road 1 adjacent to Powerhouse No. 2 from 8S05, Canyon Road	08S005E
159	Old housing road 3 adjacent to Powerhouse No. 2 from 8S05E	08S005EA
158	Old housing road 2 adjacent to Powerhouse No. 2 from 8S05E	08S005EC
69	Access road south from Railroad Grade to West Portal	08S008A
41	8S13 from gate to 8S05, the Canyon Road	08S013(02)
168	8S13K Access road to Powerhouse No. 2 penstock	08S013K
22	8S66, from west end of Dam 2 to 8S66A	08S066(01)
23	8S66 from gate to west end of Dam 2	08S066(02)
207	8S66A, access road to gaging station on Big Creek below Huntington Lake	08S066A
42	8S66B from Dam 2 to end	08S066B
171	Short road between 8S66B and 8S66BC	08S066BA
99	East end of Dam 1 to Dam 1 drainage gates	08S066BC
107	8S66C on public lands from 8S301 to 8S66 east	08S066C(02)
107	8S66C on public lands from 8S301 to 8S66 east	08S066C(03)
107	8S66C on SCE private lands from gate to 8S302	08S066C(04)
184	Road over Dam 2	08S066X
186	8S082 access to Hydro offices at Big Creek	08S082

Table 3.1.2-3. List of Project Roads and Trails.

SCE Map No.	SCE Road Name/Description	USDA-FS Road No.
Big Creek Nos. 1 and 2 Project (FERC No. 2175) (continued)		
Roads (Continued)		
1	8S082A access to Hydro offices at Big Creek	08S082A
249	Access road to Warehouse	08S082AA
185	8S082B access to Powerhouse No. 1	08S082B(02)
248	Upper access road to Wastewater treatment plant from 8S82B	08S082BA
247	Lower access road to Wastewater treatment plant from 8S82B	08S082BB
245	Access road to Fish Farm upper gate	08S082BC
188	8S082C access to Hydro offices at Big Creek	08S082C
187	8S082D access to Hydro offices at Big Creek	08S082D
250	Upper access road to SCE company housing	08S082E
252	Lower access road to SCE company housing	08S082EA
251	Access road to Domestic water treatment plant from FRE 2710	08S082F
246	Upper access road to Powerhouse No. 1 from FRE 2710	08S082J
189	8S082X access to Hydro offices at Big Creek	08S082X
48	8S83 from 8S66 to 8S83A	08S083(02)
200	8S83A, connector road between 8S66C and 8S83	08S083A
28	8S301 from gate with 8S66C to penstock surge pipes	08S301
47	8S302, access to Big Creek No. 1 42-inch gatehouse	08S302
Trail		
261	Trail to Scott Lake Domestic Diversion	NA
Big Creek Nos. 2A and 8, and Eastwood Project (FERC No. 67)		
Roads		
68	Mono Creek Diversion access road	05S080Z
4	7S01B Access road to Florence Work Camp	07S001B(02)
219	7S01BA Florence Work Camp road from 7S01B	07S001BA
71	7S370D Access road to Florence Dam and water storage tank from 7S370	07S370D
237	7S370F Access road to Florence Dam from 7S370	07S370F
54	8S02 from Highway 168 to 8S02B	08S002(01)
54	8S02 from Highway 168 to 8S02B	08S002(02)
197	8S02B Access to Huntington-Pitman-Shaver tunnel adit	08S002B
33	8S03 (from 8S05, Canyon Road, to 8S03A, Powerhouse No. 8 access road)	08S003(01)
166	Access road to Powerhouse No. 8 from 8S03	08S003A
21	8S05, Canyon Road (from Powerhouse No. 2 and 8S05E to Powerhouse No. 8)	08S005(01)
77	8S05F Access road to Powerhouse No. 8 penstock from 8S05	08S005F
157	8S05FB Access road to Powerhouse No. 8 penstock from 8S05F	08S005FB
167	Road to communication line near Powerhouse No. 8	08S005L
69	Access road south from Railroad Grade to West Portal	08S008A
41	8S13 from the gate to 8S05, Canyon Road	08S013(02)
258	8S47 Access road to Eastwood Powerstation Transmission Line tower - from gate to end	08S047(02)
48	8S83 from 8S83A to Huntington Shaver Siphon	08S083(01)
56	Pitman Creek Diversion access road	08S094
174	8S303 Access road to Eastwood Overflow Campground	08S303
156	9S03 from 8S08 to FRE 2710	09S003(01)
262	9S17 access road to Eastwood Transmission line from Hwy 168	09S017

Table 3.1.2-3. List of Project Roads and Trails.

SCE Map No.	SCE Road Name/Description	USDA-FS Road No.
Big Creek Nos. 2A and 8, and Eastwood Project (FERC No. 67) (Continued)		
Roads (Continued)		
55	9S24 from Hwy 168 to North Fork Stevenson Creek gate No. 2 (Tunnel No. 7 Outlet)	09S024
89	9S32 from gate near Highway 168 to EPH Transmission Line	09S032
50	9S32A, spur from 9S32 to east side of Balsam Forebay	09S032A
153	9S32AB, spur from 9S32A to Balsam Forebay	09S032AB
170	Road below Balsam Forebay Dam	09S032C
208	9S32CA Access road to Eastwood Powerstation Transmission Line tower	09S032CA
232	9S32CB Access road to Eastwood Powerstation Transmission Line tower	09S032CB
242	9S32CC Access road to Eastwood Powerstation Transmission Line tower	09S032CC
231	9S32CD Access road to Eastwood Powerstation Transmission Line tower	09S032CD
230	9S32CE Access road to Eastwood Powerstation Transmission Line tower	09S032CE
241	9S32CF Access road to Eastwood Powerstation Transmission Line tower	09S032CF
84	9S58 from Shaver Marina to North Fork Stevenson Gage	09S058
114	Access road to Eastwood Power Tunnel entrance	09S058K
243	9S311 Access to Eastwood Powerstation Transmission Line tower	09S311(01)
243	9S311 Access to Eastwood Powerstation Transmission Line tower	09S311(02)
244	9S311A Access to Eastwood Powerstation Transmission Line tower	09S311A
19	9S312 access to Eastwood Substation from Highway 168	09S312
2	Camp Edison Roads	NA
83	Access road to Shaver Dam north	NA
49	Access road to Shaver Dam south	NA
109	Access road to Eagle Point Boat Only Day Use Area from 9S58	NA
110	Access road to Eastwood Tailrace	NA
115	Access Tunnel to Eastwood Power Station	NA
Trails		
265	Trails to North-South Slide Creek Diversions	NA
108	Trail to Pitman Creek Gage near Tamarack Mountain (below shaft)	NA
74	Trail to Big Creek Gage below Dam 5	NA
91	Trail to Bolsillo Creek Gage above Intake	NA
12	Trail to Camp 62 Creek Gage and Diversion Dam	NA
259	Trail to South Fork San Joaquin River Gage downstream of Jackass Meadow	NA
260	Trail to Chinquapin Creek Gage and Diversion Dam	NA
92	Trial to Bear Creek Gage upstream of Bear Forebay	28E01
14	Trail to Tombstone Creek Diversion	NA
88	Trail from Jackass Meadow Campground to Florence Dam outlet and Gage	NA
86	Trail to Crater Creek Diversion Ditch (off of the Dutch Lake Trail)	NA
17	Two trails to Stevenson Creek Gage below Shave Lake Dam	NA
Big Creek No. 3 Project (FERC No. 120)		
Roads		
21	8S05, Canyon Road (from junction with 8S03 to junction with Italian Bar Road)	08S005(03)
72	Access road to Powerhouse No. 3 penstocks and gate house downhill from 8S05, Canyon Road	08S005A
217	8S05B Access road to Powerhouse No. 3 penstock from 8S05 Canyon Road	08S005B
119	8S05G Access road to Powerhouse No. 3 surge chamber uphill from 8S05 Canyon Road	08S005G

Table 3.1.2-3. List of Project Roads and Trails.

SCE Map No.	SCE Road Name/Description	USDA-FS Road No.
Big Creek No. 3 Project (FERC No. 120) (Continued)		
Roads (Continued)		
24	8S05T Access to tailings	08S005T
29	8S05TA Access to tailings	08S005TA
216	9S20 Access to Carpenter shop	09S020
85	9S20A Access road to transmission line tower	09S020A
62	9S20B Access road to transmission line tower	09S020B
64	9S20C Connector road between 9S20 loop	09S020C
13	9S20D Access to Carpenter Shop	09S020D
257	9S20DA Access to Garage and shops	09S020DA
51	9S20E Access to material yard	09S020E
87	9S20F Connector road between 9S20 loop	09S020F
127	9S88 from Italian Bar Road to old company housing	09S088
5	9S88A Access to old company housing	09S088A
256	9S88X Access road to Powerhouse No. 3 water tank and shop	09S088X
215	9S88XA Access road to old company housing from 9S88X	09S088XA
61	9S89 Access road to Powerhouse No. 3 administrative bldg. from Italian Bar Road	09S089
59	9S89BA Access road to Powerhouse No. 3 and switchyard	09S089BA

Note:
NA = Not Available

Table 3.1.2-4. Physical Constraints of Project Facilities.[1]

	MIF Max Pipe Capacity (cfs)	Diverted Max Pipe Capacity (cfs)	Max Drain Gate Capacity (cfs)
Mammoth Pool (FERC Project No. 2085)			
Rock Creek, Diversion to San Joaquin River	No Existing	30 cfs	43 cfs
Ross Creek, Diversion to San Joaquin River	No Existing	10 cfs	33 cfs
San Joaquin River, Mammoth Pool Dam to Dam 6	50 cfs	Mammoth Tunnel = 2,100 cfs	HB Valve 1,800 cfs
Big Creek Nos. 1 and 2 (FERC Project No. 2175)			
Ely Creek, Diversion to Big Creek	No Existing	9 cfs	18 cfs
Adit 8 Creek, Diversion to Big Creek			
Big Creek, Huntington Lake to Dam 4	5 cfs	Tunnel 1 = 690 cfs	3 gates at 594 cfs each
Big Creek, Dam 4 to Dam 5	No Existing	Tunnel 2 = 600 cfs	1179 CF
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67)			
Mono Creek, Diversion to South Fork San Joaquin River	16 cfs	450 cfs	2 gates at 85 cfs each
Balsam Creek, Diversion to Forebay	No Existing	9 cfs	33 cfs
Big Creek, Dam 5 to San Joaquin River	12 cfs	Tunnel 8 = 1,173 cfs	2 gates at 989 cfs each
North Fork Stevenson Creek, tunnel outlet to Shaver Lake	10 cfs	Diversion Channel 1,500 cfs	1,500 cfs
Balsam Creek, Forebay to Balsam Creek Diversion	3 cfs	EPS Power Tunnel = 2,500 cfs	130 cfs
Pitman Creek, Diversion to Big Creek	10 cfs	Tunnel 7 = 1,480 cfs (combined with Huntington) 800 cfs (Pitman Only)	14 cfs
Bear Creek, Diversion to SF San Joaquin River	16 cfs	450 cfs	2 gates at 70 cfs each
SF San Joaquin River, Florence to Mammoth Pool	81 cfs	Ward Tunnel = 1,760 cfs	2 gates at 400 cfs each
Crater Creek, Diversion to SF San Joaquin River[2]	No Existing	Diversion Channel 80 cfs	None
Chinquapin Creek, Diversion to SF San Joaquin River	2 cfs	30 cfs	10 cfs
Camp 62 Creek, Diversion to SF San Joaquin River	1 cfs	30 cfs	33 cfs
Bolsillo Diversion, Division to SF San Joaquin River	0.65 cfs	30 cfs	23 cfs
Hooper Creek, Diversion to SF San Joaquin River	15 cfs	85 cfs	80 cfs
South Slide Creek, Diversion to Confluence with North Slide Creek[2]	No Existing	4 cfs	None
North Slide Creek, Diversion to SF San Joaquin River[2]	No Existing	4 cfs	None
Tombstone Creek, Diversion to SF San Joaquin River[2]	No Existing	7 cfs	None
Stevenson Creek, Shaver lake Dam to San Joaquin River	36 cfs	Tunnel 5 = 650 cfs	HB Valve 450 cfs
Big Creek No. 3 (FERC Project No. 120)			
San Joaquin River, Dam 6 to Redinger	146 cfs	Tunnel 3 = 2,431 cfs	4 gates at 1,100 cfs each

[1]Assumes reservoir of diversion is at full capacity. Capacities are generally derived from operating assumptions, engineering design or calculations.

[2]Recommended for decommissioning under the Proposed Action

Table 3.1.4-1. List of Bypass and Flow Augmented Stream Reaches Associated with the Four Big Creek ALP Projects.

Mammoth Pool (FERC Project No. 2085)

Bypass Stream Reaches (Small Tributaries)
- Rock Creek, Diversion to San Joaquin River
- Ross Creek, Diversion to San Joaquin River

Bypass Stream Reaches (San Joaquin River)
- San Joaquin River, Mammoth Pool Dam to Mammoth Pool Powerhouse/Dam 6

Big Creek Nos. 1 and 2 (FERC Project No. 2175)

Bypass Stream Reaches (Small Tributaries)
- Ely Creek, Diversion to Big Creek

Bypass Stream Reaches (Moderate Tributaries)
- Big Creek, Huntington Lake to Dam 4
- Big Creek, Huntington Lake to Powerhouse 1/Dam 4
- Big Creek, Dam 4 to Dam 5
- Big Creek, Dam 4 to Powerhouse 2/2A/Dam 5
- Balsam Creek, Diversion to Big Creek

Flow Augmented Streams
- Rancheria Creek below Portal Powerhouse

Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67)

Bypass Stream Reaches (Small Tributaries)
- Tombstone Creek, Diversion to SF San Joaquin River
- North Slide Creek, Diversion to SF San Joaquin River
- South Slide Creek, Diversion to Confluence with North Slide Creek
- Crater Creek, Diversion to SF San Joaquin River
- Chinquapin Creek, Diversion to SF San Joaquin River
- Camp 62 Creek, Diversion to SF San Joaquin River
- Bolsillo Creek, Diversion to SF San Joaquin River

Bypass Stream Reaches (Moderate Tributaries)
- Bear Creek, Diversion to SF San Joaquin River
- Mono Creek, Diversion to SF San Joaquin River
- Hooper Creek, Diversion to SF San Joaquin River
- Pitman Creek, Diversion to Big Creek
- Big Creek, Dam 5 to San Joaquin River
- Big Creek, Dam 5 to Powerhouse 8/Dam 6
- Stevenson Creek, Shaver Lake Dam to San Joaquin River

Bypass Stream Reaches (San Joaquin River)
- SF San Joaquin River, Florence to Mammoth Pool
- SF San Joaquin River, Florence Dam to San Joaquin River

Flow Augmented Streams
- Balsam Creek, Forebay to Balsam Creek Diversion
- NF Stevenson Creek, tunnel outlet to Shaver Lake

Big Creek No. 3 (FERC Project No. 120)

Bypass Stream Reaches (San Joaquin River)
- San Joaquin River, Dam 6 to Powerhouse 3/Redinger Lake

Table 3.1.4-2. Summary of Water Rights for the Four Big Creek ALP Projects.

SWRCB Application Number	SWRCB Permit Number	SWRCB License Number	SWRCB Supplemental Statement. No.	Location
Mammoth Pool Project (FERC Project No. 2085)				
13929	11080	8739	---	Mammoth Pool, Rock & Ross Creeks, BC Nos. 3 & 4: Direct Div. & Storage
26543	20676	*pending*	---	Mammoth Pool Fishwater Turbine
26544	20678	*pending*	---	Mammoth Pool Dam
26545	20695	*pending*	---	Mammoth Pool Powerhouse Turbine Upgrade
Big Creek Nos. 1 and 2 (FERC Project No. 2175)				
26535	20673	*pending*	---	Balsam Creek (BC 2 Tunnel)
26535	20673	*pending*	---	Ely Creek (BC 2 Tunnel)
26535	20673	*pending*	---	Adit 8 Creek (BC 2 Tunnel)
26536A	20744	*pending*	---	Big Creek - Scott Lake (Big Creek Domestic)
26536B	20745	*pending*	---	Big Creek - Huntington Lake/Scott Lake (Trout Farm)
---	---	---	1828	Ely Meadow Unnamed Spring (Tree Farm)
Big Creek Nos. 2A, 8 and John Eastwood Project (FERC Project No. 67)				
1341	807	1617	---	Mono Creek Direct Div. to Ward Tunnel
1342	808	1618	---	Bear Creek Direct Div. to Ward Tunnel
1343	809	1619	---	SF SJR at Blayney: Florence Storage or Direct Div. to Ward Tunnel
1344	810	1620	---	SF SJR at Florence: Florence Storage or Direct Div. to Ward Tunnel
1345	811	1621	---	Pitman Creek, Shaver Storage or Direct Div. to BC 2A
1346	812	1622	---	Stevenson Creek, Shaver Storage or Direct Div. to BC 2A
11115	6584	5730	---	Florence, Hooper Creek, & "Small Streams": Direct Div. to Ward Tunnel
26533	19261	*pending*	---	West Fork Balsam Creek (Balsam Meadow Forebay)
26534	20672	*pending*	---	Crater Creek at Diversion Dam (Florence Lake)
26534	20672	*pending*	---	Camp 62 Creek (Ward Tunnel)
26534	20672	*pending*	---	Chinquapin Creek (Ward Tunnel)
26542	20675	*pending*	---	Big Creek No. 8 Turbine Upgrade
---	---	---	1827	Shaver Lake Unnamed Spring (Dam Tender's Domestic)
Big Creek No. 3 Project (FERC Project No. 120)				
2522	979	2539	---	San Joaquin River: Big Creek No. 3, Units 1, 2, & 3
26546	20674	*pending*	---	Big Creek No. 3 Turbine Upgrade
24701	16866	*pending*	---	Big Creek No. 3, Unit 5
11352	6585	3633	---	San Joaquin River: Big Creek No. 3, Unit 4

Table 3.1.4-3. Big Creek System Mammoth Pool Operating Agreement.

Mammoth Pool Operating Contract September 30 Storage Constraints and Minimum Flow Constraints			
Computed Natural Run-off @ Friant Dam (acre-feet)	**10/1 Beginning Storage (acre-feet)**	**9/30 Maximum Allowable Year-Ending Storage (acre-feet)**	**Minimum Allowable Flow Past Dam 7 (cubic feet per second)**
A-J = April to July FWY = Full Water Year			---
A-J ≤ 650,000	(1st year)	≤ 152,500	---
A-J ≤ 650,000	(2nd sequential year)	Not to exceed beginning storage	---
A-J > 650,000 FWY ≤ 1,200,000	≥ 202,500 & < 325,000	Equal as nearly as possible to beginning storage	---
A-J > 650,000 FWY ≤ 1,200,000	≥ 325,000	Not more than beginning storage and not less than 325,000	---
A-J > 650,000 FWY ≤ 1,200,000	< 202,500	Not more than beginning storage (plus amount computed A-J run-off at Friant exceeds 750,000) but not to exceed 202,500	---
FWY > 1,200,000 ≤ 1,600,000	≥ 202,500	Not less than beginning storage plus amount of FWY computed run-off at Friant less 1,200,000	≥ 615,000 Jun 1 – Sept 30 ≥ 450,000 Jul 1 – Sept 30 (shall be reduced if necessary to meet storage criteria)
FWY > 1,200,000 ≤ 1,600,000	< 202,500	Not less than 202,500 but may exceed beginning storage by up to 50,000 but total cannot exceed 325,000	≥ 615,000 Jun 1 – Sept 30 ≥ 450,000 Jul 1 – Sept 30 (shall be reduced if necessary to meet storage criteria)
FWY > 1,600,000	---	≥ 350,000	≥ 465,000 Jul 1 – Sept 30 (shall be reduced if necessary to meet storage criteria)

Table 3.1.4-3. Big Creek System Mammoth Pool Operating Agreement (continued).

Mammoth Pool Operating Contract September 30 Storage Constraints and Minimum Flow Constraints		
Preceding Year Computed Natural Run-off at Friant Dam (acre-feet)	**10/1 Beginning Storage (acre-feet)**	**3/1 Minimum Storage (acre-feet)**
---	≤ 300,000	Not less than beginning storage less 150,000
≤ 1,400,000	> 300,000	Not less than the greater of (I) 150,000 or (ii) beginning storage less 175,000
> 1,400,000	> 300,000	Not less than 50% of beginning storage
> 2,000,000	> 350,000	As much as 50,000 less than 50% of beginning storage

Mammoth Pool Operating Contract Maximum Flow Constraints			
Current Mar 1 Forecast of FWR Run-off at Friant Dam*	**Maximum Allowable Flow Passing Dam 7 for Month of March**	**March 1-20 Flows**	**March 21-31 Flows**
< 1,500,000	≤ 95,000 or the Dam 7 computed natural flow, whichever is greater	If the flow passing Dam 7 during the first 20 days of March does not exceed 61,000	…then allowable flow may be exceeded if the flow for the month passing Dam 7 does not exceed the natural run-off by more than 61,000 during the last 11 days of the month
≥ 1,500,000	No restrictions		

***As stipulated in the Contract

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects.

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Mammoth Pool (FERC Project No. 2085)			
Dams and Diversions			
Mammoth Pool	A		A
Rock Creek		R	
Ross Creek	R	R	
Power Generation			
Mammoth Pool PH	R		R
Mammoth Pool Fish Water Generator	R		R
Gaging Stations			
Mammoth Pool Fish Water Generator	R		
Water Conveyance - Mammoth Pool Powerhouse			
Intake Gate House	R		R
Surge Chamber, Rock Trap	R		
Rock Trap Flushing Channel	I		
Valve House	R		
Penstocks	R		R
Power Transmission Lines			
MPPH - BC3 220KV	A		
Helicopter Landing Sites			
San Joaquin River above Shakeflat Creek*	R	R	R
Mammoth Pool Dam*	R	R	R
Project Roads			
6S25 Mammoth Pool Road, from 7S20, Shake Flat Creek access to end at east abutment (#30) *	R	R	R
6S25DA Spur to Windy Point Picnic Area from 6S25D (#164) *	I	I	I
6S25G Mammoth Pool Fish Water Generator access road from 6S25 (Mammoth Pool Road) to Base of Mammoth Pool Dam (#6)	R	R	R
7S47B Access road to Rock Creek Tunnel Muck Pile (#102) *	R	R	I
8S03 from PH No. 8 to Mammoth Pool PH (#33)	R	R	R
8S03B Access road from 8S03 to Mammoth Pool penstock (#80) *	R	R	R
8S03B Access road to Mammoth Pool Transmission Line from 8S03C (#145)	R	R	I
8S03C Access road from 8S03 to Mammoth Pool transmission line (#79)	R	R	
8S03CA Spur road to Mammoth Pool Transmission Line (#144) *	R	R	I
8S03CC Access road to Mammoth Pool Transmission Line from 8S03C (#146)	R	R	I

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Mammoth Pool (FERC Project No. 2085) (continued)			
Project Roads (continued)			
8S03D Access road from 8S03 to Mammoth Pool PH Surge Chamber (#78)	R	R	
8S44 Mammoth Pool transmission line access road (#213)	R	R	
8S44Y Mammoth Pool PH Transmission Line access road from gate near 8S03 to 9S42 (#37)	R	R	
8S44YA Mammoth Pool transmission line access road (#138)	R	R	
8S44YB Mammoth Pool Transmission Line access road (#136) *	R	R	I
9S42 Mammoth Pool PH Transmission Line access road from gate near County Road 225, Italian Bar Road, to 8S44 (#18)	R	R	
9S42A Access road to Mammoth Pool transmission line from 9S42 (#135)	R	R	
Project Trail			
Trail to San Joaquin River Gage above Shakeflat Creek (#75)	I	I	I
Big Creek Nos. 1 and 2 (FERC Project No. 2175)			
Dams and Diversions			
Huntington Lake Dams 1, 2, 3, 3a	A		A
Dam 4	A		A
Balsam Creek	R	R	R
Ely Creek	R	R	R
Power Generation			
Big Creek PH No. 1	R		R
Big Creek PH No. 2	R		R
Gaging Stations			
Big Creek below Huntington Lake at Dam 1	R		
Balsam Creek at Diversion Dam	A		
Water Conveyance - Powerhouse No. 1			
Upper 84" Valve House below Huntington Lake	R		R
Upper 60" Valve House below Huntington Lake	R		R
60" & 84" Flowlines below Huntington Lake	R		R
Lower 84" Valve House at top of Ph 1 penstock	R		R
Lower 60" Valve House at top of Ph 1 penstock	R		R
42" Valve House at top of Ph 1 penstock	R		R
Vent Stacks	R		R
Penstocks	R		R

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 1 and 2 (FERC Project No. 2175) (continued)			
Water Conveyance - Powerhouse No. 2			
Vent Stacks below railroad grade	R		R
Penstocks	R		R
Adit 7&1/2, Tunnel 2	R		
Adit 8, Tunnel 2	R		R
Adit 7&1/2 Leakage Weir	R		
Balsam Creek Diversion Piping (Adit 3)	R		A
Ely Creek Diversion Piping (Adit 6)			R
Rock Trap/Surge Chamber (9' Gate House) on the railroad grade	R		R
42" Valve House and valves below railroad grade	R		R
Drain piping & Valves (10" & 24") from Surge Chamber, below railroad grade	R		R
Water Conveyance - Huntington-Pitman-Shaver			
Inlet Structure & Gate 1A and 1B at Dam 2 (10' Gate House)	R		
Weather Stations			
Big Creek No. 1	R		R
Huntington Lake	R		R
Buildings/Camps			
Big Creek PH No.1 Facilities	R		R
Storage Yards			
Big Creek PH No. 1	I		I
Utilities – Water Supply/Treatment			
Big Creek PH No. 1	R		R
Utilities – Sewage Treatment			
Big Creek PH No. 1 Community	A		A
Project Power Lines Less than 33kV			
Musick 7KV	A		A
East Incline 7KV (Not in Service)	A		A
Miscellaneous			
Fish Hatchery	R		
Helicopter Landing Sites			
Hodges (Big Creek) Heliport	R	R	R

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 1 and 2 (FERC Project No. 2175) (continued)			
Project Roads			
8S05 Canyon Road (from Huntington Lake Road to PH No. 2 and 8S05E) (#21)	R	R	
8S05C PH No.2 access road from Canyon Road (#81)	R	R	
8S05C Powerhouse No.2 access road from Canyon Road (#81)	R	R	R
8S05CA Access to Big Creek No. 2 switchyard (#160) *	R	R	R
8S05E Old housing road 1 adjacent to Powerhouse No. 2 from 8S05, Canyon Road (#16)		I	
8S05EA Old housing road 2 adjacent to Powerhouse No. 2 from 8S05E (#159)		I	
8S05EC Old housing road 3 adjacent to Powerhouse No. 2 from 8S05E (#158)		I	
8S082 Access to Hydro offices at Big Creek (#186) *	R		I
8S082A Access to Hydro offices at Big Creek (#1)	R		I
8S082B Access to Hydro offices at Big Creek (#185) *	R		I
8S082C Access to Hydro offices at Big Creek (#188) *	R		I
8S082D Access to Hydro offices at Big Creek (#187) *	R		I
8S082X Access to Hydro offices at Big Creek (#189) *	R		I
8S08A Access road south from Railroad Grade to West Portal (#69) *	R	R	R
8S13 from the gate to 8S05, the Canyon Road (#41)	R	R	
8S13K Access road to Powerhouse No. 2 penstock (#168) *	R	R	R
8S301 From gate with 8S66C to penstock surge pipes (#28)	R	R	R
8S302 Access to Big Creek No. 1 42-inch gatehouse (#47)	R	R	R
8S66 from gate to west end of Dam 2 (#23)	R	R	R
8S66 West end of Dam 2 to 8S66A (#22)	R	R	
8S66A Access road to gaging station on Big Creek below Huntington Lake (#207)	R	R	
8S66B from Dam 2 to end (#42)	R	R	R
8S66BA Short road between 8S66B and 8S66BC (#171) *	R	I	R
8S66BC East end of Dam 1 to Dam 1 drainage gates (#99) *	R	R	R
8S66C on public lands from 8S301 to gate to 8S302 (#107) *	R	R	R
8S66X Road over Dam 2 (#184)	R		R
8S82AA Access road to Warehouse (#249) *	R		I
8S82BA Upper access road to Wastewater treatment plant from 8S82B (#248) *	R	R	R
8S82BB Lower access road to Wastewater treatment plant from 8S82B (#247) *	R	R	R
8S82BC Access road to Fish Farm upper gate (#245) *	R		R

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 1 and 2 (FERC Project No. 2175) (continued)			
Project Roads (Continued)			
8S82E Upper access road to SCE company housing (#250) *	R		I
8S82EA Lower access road to SCE company housing (#252) *	R		I
8S82F Access road to Domestic water treatment plant from FRE 2710 (#251) *	R		I
8S82J Upper access road to Powerhouse No. 1 from FRE 2710 (#246) *	R		I
8S83 segment from 8S66 to 8S83A (#48)	R	R	R
8S83A Connector road between 8S66C and 8S83 (#200)	R	R	R
Project Trail			
Trail to Scott Lake Domestic Diversion (#261)	I		I
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67)			
Dams and Diversions			
Florence Lake	A		A
Shaver Lake	A		A
Bear Creek Diversion	R		
Mono Creek Diversion	R		
Pitman Creek	R		
Balsam	A		A
Dam 5	A		A
Camp 62 Creek	R		A
Bolsillo Creek	R		
Power Generation			
Big Creek PH No. 2A	R		R
Big Creek PH No. 8	R		R
Gaging Stations			
Camp 62 Creek below Diversion Dam	R		
Huntington-Shaver Conduit gate 2 release	R		
Middle Fork Balsam Creek below Balsam Meadows Forebay	R		
Stevenson Creek below Shaver Lake	R		R
South Fork San Joaquin River above Hooper Creek (with cable crossing)	R		

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)			
Water Conveyance - Powerhouse No. 2A			
Intake Gate House at Shaver Lake	I		
Surge Chamber, Rock Trap	I		
102" Valve House	R		R
Penstocks	R		R
Water Conveyance - Powerhouse No. 8			
Intake structure at Dam 5	R		R
Adit 1, Tunnel 8		R	
Surge Chamber - includes trash drain and penstocks valves	R		R
Penstocks	R		R
Water Conveyance - Eastwood Power Station			
Inlet Structure (Gate 4)	R		R
Surge Chamber	R		A
Water Conveyance - Mono-Bear Siphon			
Combined Flow Line (siphon)	I		
Water Conveyance - Huntington-Pitman-Shaver			
Siphon w 4" and 10" Drain Valves	R		R
Vent Stacks	R		R
Gate 3 Outlet to Balsam Forebay	R		R
Gate 2 Outlet to NF Stevenson Creek	R		
Water Conveyance - Diversion Channel			
Crater Creek	I		
Water Conveyance - HB Valves			
Shaver Lake	R		R
Weather Stations			
Florence Lake	R		R
Kaiser Ridge/Mt Givens	R		R
Shaver Lake	R		R
Buildings/Camps			
Florence Work Camp	R		R
Big Creek 8 Facilities	R		R

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)			
Storage Yards			
Florence Lake Work Camp	I		
Camp 62	I		
Big Creek PH No.2 & PH No.2A	I		I
Eastwood School Site	I		I
Utilities - Water Supply/Treatment			
Camp Edison	R		R
Florence Work Camp	R		R
Utilities - Fuel/Gasoline/Diesel			
Big Creek PH No. 8	A		A
Florence Work Camp	R		
Project Power Lines Less than 33kV			
Jumbo 12KV	A		A
Pitman 33KV (to diversion)	A		A
Power Transmission Lines			
EPS - BC1 220KV	A		
Switchyards			
Eastwood Switchyard	A		A
Recreation - Shaver Lake			
Camp Edison Campground	A	A	A
Camp Edison Boat Ramp/Launch	A	A	A
Day Use Areas on North Shore Roads 1 & 2	A	A	A
Day Use Area off Hwy 168 (The Point)	A	A	A
Eagle Point Boat Only Day-Use Area	A	A	A
Balsam Meadow Forebay			
Balsam Meadow Forebay Day-Use Picnic Area	A	A	A
Balsam Meadow Trailhead and Parking	A	A	A
Helicopter Landing Sites			
Eastwood School*	R	R	R
Camp 62 at junction of Kaiser Pass Road*	R	R	R
Bear Creek Diversion*	R	R	R
Florence Lake Camp*	R	R	R

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)			
Helicopter Landing Sites (Continued)			
Florence Lake Dam*	R	R	R
Florence Lake Gaging Station*	R	R	R
South Fork San Joaquin River Florence Spill Station*	R	R	R
South Fork San Joaquin River below Hooper*	R	R	R
Hooper Creek at Diversion*	R	R	R
Mono Creek at Diversion*	R	R	R
Mono Creek below Lake T.A. Edison*	R	R	R
Mt. Givens Telecom Site*	R	R	R
Summit at Shaver Hill*	R	R	R
Tiffany Pines at Camp Edison*	R	R	R
Project Roads			
5S80Z Mono Creek Diversion access road (#68)	I	I	I
7S01B Florence Work Camp access road from gate on 7S01 near picnic area (#4)	R	R	
7S01BA Florence Work Camp road from 7S01B (#219) *	I	I	I
7S370D Access road to Florence Dam and water storage tank from 7S370 (#71) *	I	I	I
7S370F Access road to Florence Dam from 7S370 (#237) *	I	I	I
8S02 from Highway 168 to 8S02B (#54) *	I	I	I
8S02B Access to Huntington-Pitman-Shaver tunnel adit (#197) *	I	I	I
8S03, Canyon Road from PH No. 8 to Mammoth Pool PH (#33)	R	R	R
8S03A Access road to Powerhouse No. 8 from 8S03 (#166) *	R	R	R
8S05, Canyon Road (from PH No. 2 and 8S05E to 8S05A PH No. 8 access road) (#21)	R	R	R
8S05F Access road off 8S05, Canyon Road, that accesses Powerhouse No. 8 penstock (#77)	R	R	R
8S05FB Access road to Powerhouse No. 8 penstock from 8S05 (#157)	R	R	R
8S05L Road to communication line near Powerhouse No. 8 (#167) *	I	I	I
8S08A Access road south from Railroad Grade to West Portal (#69)	R	R	R
8S13 from the gate to 8S05, Canyon Road (#41)	R	R	R
8S13 from the gate to 8S05, the Canyon Road (#41)	R	R	
8S303 Access road to Eastwood Overflow Campground (#174) *	I	I	I
8S47 Access road to Eastwood Powerstation Transmission Line tower - from gate to end (#258) *	R	R	R

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)			
Project Roads (Continued)			
8S83 segment from 8S83A to Huntington-Shaver Siphon (#48)	R	R	R
8S94 Pitman Creek Diversion access road (#56)	I	I	I
9S03 from 8S08 to FRE 2710 (non-project segment on SCE private lands) (#156) *	I	I	I
9S17 Access road to Eastwood Transmission line from Hwy 168 (#262) *	I	I	I
9S24 from Hwy 168 to North Fork Stevenson Creek gate No. 2 (Tunnel No. 7 Outlet) (#55)	R	R	R
9S311 Access to Eastwood Powerstation Transmission Line tower (#243) *	R	R	R
9S311A Access to Eastwood Powerstation Transmission Line tower (#244) *	R	R	R
9S312 Access to Eastwood Substation from Highway 168 (#19)	R	R	R
9S32 from gate near Highway 168 to EPH Transmission Line (#89)	I	I	I
9S32A Spur from 9S32 to east side of Balsam Forebay (#50)	R	R	R
9S32AB Spur from 9S32A to Balsam Forebay (#153) *	R	R	R
9S32C Road below Balsam Forebay Dam to EPH transmission line (#170)	I	I	I
9S32CA Access road to Eastwood Powerstation Transmission Line tower (#208) *	R	R	R
9S32CB (#232) *	R	R	R
9S32CC (#242) *	R	R	R
9S32CD (#231) *	R	R	R
9S32CE (#230) *	R	R	R
9S32CF (#241) *	R	R	R
9S58 from Shaver Marina to NF Stevenson gage (#84)	R	R	R
9S58K Access road to Eastwood Power Tunnel entrance (#114)	R	R	R
Access road to Eagle Point Boat Only Day Use Area (off of 9S58) (#109)	R	R	
Access road to Eastwood Tailrace (off of 9S58) (#110)	I	I	I
Access road to Shaver Dam north (#83)	R	R	R
Access road to Shaver Dam south (#49)	R	R	
Camp Edison Roads (#2)	R	R	
Project Trails			
Trail to Big Creek Gage below Dam 5 (#74) *	R		R
Two trails to Stevenson Creek Gage below Shaver Lake Dam (#17)	R		R
Trail to Pitman Creek Gage near Tamarack Mountain (below shaft) (#108)	I		I
Trail to Bolsillo Creek Gage above Intake (#91)	I		I

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67) (continued)			
Project Trails (Continued)			
Trail to Camp 62 Creek Gage and Diversion Dam (#12)	I		I
Trail to Chinquapin Creek Gage and Diversion Dam (#260)	I		I
Trails to North-South Slide Creek Diversions (#265)	I		I
Trail to South Fork San Joaquin River Gage downstream of Jackass Meadow (#259) *	I		I
Trail to Bear Creek Gage upstream of Bear Forebay (#92)	I		
Trail to Tombstone Creek Diversion (#14)	I		
Trail to Crater Creek Diversion Ditch (off of the Dutch Lake Trail) (#86)	I		
Big Creek No. 3 (FERC Project No. 120)			
Dams and Diversions			
Dam 6	R		R
Power Generation			
Big Creek PH No.3	R		R
Water Conveyance - Powerhouse No. 3			
Valve House	R		R
Penstocks	R		R
Adit 1, Tunnel 3		R	
Adit 2, Tunnel 3		R	
Adit 3, Tunnel 3		R	
Rock/Sand Trap Drain Piping & Valves	R		R
Manifold Structure	R		R
Buildings/Camps			
Big Creek PH No.3 Facilities	R		R
Storage Yards			
Big Creek PH No.3	I		I
Utilities - Water Supply/Treatment			
Big Creek PH No. 3	R		R
Project Power Lines Less than 33kV			
Manifold 2.4KV	A		A

Table 3.1.5-1. Vegetation Management in the Vicinity of the Four Big Creek ALP Projects (continued).

Facility	Vegetation Control		
	Trimming		
	Hand	Equipment	Herbicides
Big Creek No. 3 (FERC Project No. 120) (continued)			
Project Roads			
8S05, Canyon Road (from junction with 8S03 to junction with Italian Bar Road) (#21)	R	R	R
8S05A Access road to Powerhouse No. 3 penstocks and gate house downhill from 8S05 (#72)	R	R	R
8S05B Access road to Powerhouse No. 3 penstock from 8S05 Canyon Road (#217) *	R	R	R
8S05G Access road to Powerhouse No. 3 penstocks and gate house uphill from 8S05 (#119)	R	R	R
8S05T Access to tailings (#24) *		I	
8S05TA Access to tailings (#29) *		I	
9S20 Access to Carpenter shop (#216) *	R		R
9S20A (#85) *	R		R
9S20B Access road to carpenter shop from Italian Bar Road (#62) *	R		R
9S20C Connector road between 9S20B loop (#64) *	R		R
9S20D Access to Carpenter Shop (#13) *	R		R
9S20DA Access to garage and shops (#257) *	R		R
9S20E (#52) *	R		R
9S20F Connector road between 9S20 loop (#87) *	R		R
9S88 from Italian Bar Road to old company housing (#127)	I		I
9S88A Access to old company housing (#5)	R		R
9S88X Access road to PH No. 3 water tank and shop (#256)	R	R	R
9S88XA Access road to old company housing from 9S88X (#215) *	R		R
9S89 Access road to Big Creek Powerhouse No. 3 and administrative buildings from Italian Bar Road (#61)	R	R	R
9S89BA Access road to PH3 and switchyard (#59) *	R		R

Notes:

A = Annual (activity typically occurs each year)

R = Regular (activity will occur one or more times in a 5-year period)

I = Infrequent (activity typically will occur during a 20-year period but less than once every 5 years)

Only Project facilities, Project-related recreation features, Project roads, and trails where SCE currently implements vegetation management are included.

* Indicates Project roads and helicopter landing sites that were added to the Project after resource surveys for the Big Creek ALP Projects were conducted.

Table 3.1.5-2. Herbicides and Other Agents Used in the Vicinity of the Four Big Creek ALP Projects.

Herbicides				
	Garlon 4® at 0.6-1.5 lbs/acre[1]	**Pathfinder II®**	**Accord® at 0.6-1.0 lbs/acre[2]**	**Velpar® at 2 lbs/acre**
Active Ingredient	Triclopyr	Triclopyr	Glyphosate	Hexazinone
Other Agents				
	Hasten®	**R-11®**	**In-Place®**	
Properties	Spray Adjuvant Non-ionic Surfactant and Esterified Vegetable Oils	Wetting Agent Non-ionic Surfactant Spreader Activator	Deposition and Retention Agent	

[1]These rates represent average coverage (20%) to maximum expected coverage (50%) using a 3.0 lb. per acre mixture.
[2]These rates represent average coverage (30%) to maximum expected coverage (50%) using a 2.0 lb. per acre mixture.

Table 3.1.5-3. Operation and Maintenance Activities Conducted Along Project Roads and Trails Associated with the Four Big Creek ALP Projects.

SCE Map No.	SCE Road Name/Description	USFS Road No.	SCE Operation & Maintenance Activities						
			Road Repair/ Clearing						
			Grading	Gravel/ Paving	Snow Removal/Sanding	Culverts/Ditches/Water Bars	Signage	Fencing	Gates
Mammoth Pool Project (FERC No. 2085)									
Roads									
6	Mammoth Pool Fishwater Generator access road from 6S25, Mammoth Pool Road, to base of Mammoth Pool Dam	06S025G	I	I		R		X*	X
80	Access road from 8S03 to Mammoth Pool penstock	08S003B	R	I		R			X
79	Access road to Mammoth Pool Transmission Line from 8S03	08S003C	R	I		R			X
144	8S03CA, spur road to Mammoth Pool Transmission Line	08S003CA	R	I		R			
145	Access road to Mammoth Pool Transmission Line from 8S03C	08S003CB	R	I		R			
146	Access road to Mammoth Pool Transmission Line from 8S03C	08S003CC	R	I		R			
78	Access road from 8S03 to Mammoth Pool Powerhouse surge chamber	08S003D	R	I		R			
213	8S44, Mammoth Pool Transmission Line access road	08S044	R	I		R	X*		X
37	8S44Y, Mammoth Pool Transmission Line access road from gate near 8S03 to 9S42	08S044Y	R	I		R	X*		X
138	8S44YA, Mammoth Pool Transmission Line access road	08S044YA	R	I		R	X*		X
136	8S44YB, Mammoth Pool Transmission Line access road	08S044YB	R	I		R	X*		X
18	9S42, Mammoth Pool Powerhouse Transmission Line access road from gate near County Road 225, Italian Bar Road, to 8S44	09S042	R	I		R	X*		X
135	Access road to Mammoth Pool Transmission Line from 9S42	09S042A	R	I		R	X*		X
102	7S47B Access road to Rock Creek Tunnel Muck Pile	07S047B	R	I		R			
33	8S03 (from Powerhouse No. 8 to Mammoth Pool Powerhouse)	08S003(02)	I	I	A	R	X*	X*	X
30	6S25, Mammoth Pool Road, from 7S20, Shake Flat Creek access, to end at east abutment	06S025(03)	I	I		I			
164	6S25DA, spur to Windy Point Picnic Area from 6S25D	06S025DA	R	I		R			
Trail									
75	Trail to San Joaquin River Gage above Shakeflat Creek	27E05	I			I			

Table 3.1.5-3. Operation and Maintenance Activities Conducted Along Project Roads and Trails Associated with the Four Big Creek ALP Projects (continued).

SCE Map No.	SCE Road Name/Description	USFS Road No.	SCE Operation & Maintenance Activities						
			Road Repair/ Clearing						
			Grading	Gravel/ Paving	Snow Removal/Sanding	Culverts/Ditches/Water Bars	Signage	Fencing	Gates
Big Creek Nos. 1 and 2 Project (FERC No. 2175)									
Roads									
21	8S05, Canyon Road (from Huntington Lake Road to Powerhouse No. 2 and 8S05E)	08S005(02)	I	I	A	R	X*	X*	X
81	Powerhouse No.2 access road from Canyon Road	08S005C	I	I	A	R	X*		
160	Access to Big Creek No. 2 switchyard	08S005CA	I	I	A	R	X*		
16	Old housing road 1 adjacent to Powerhouse No. 2 from 8S05, Canyon Road	08S005E	I			I			
159	Old housing road 3 adjacent to Powerhouse No. 2 from 8S05E	08S005EA	I			I			
158	Old housing road 2 adjacent to Powerhouse No. 2 from 8S05E	08S005EC	I			I			
69	Access road south from Railroad Grade to West Portal	08S008A	R	I		R			
41	8S13 from gate to 8S05, the Canyon Road	08S013(02)	I	I	A	R	X*		
168	8S13K Access road to Powerhouse No. 2 penstock	08S013K	I	I	I	R	X*		
22	8S66, from west end of Dam 2 to 8S66A	08S066(01)	I	I	A	R			
23	8S66 from gate to west end of Dam 2	08S066(02)	I	I	A	R			
207	8S66A, access road to gaging station on Big Creek below Huntington Lake	08S066A	I	I	A	R			
42	8S66B from Dam 2 to end	08S066B	I	I	I	R	X*		
171	Short road between 8S66B and 8S66BC	08S066BA	I	I	I	R	X*		
99	East end of Dam 1 to Dam 1 drainage gates	08S066BC	I	I	A	R			
107	8S66C on public lands from 8S301 to 8S66 east	08S066C(02)	I	I	I	R			
107	8S66C on public lands from 8S301 to 8S66 east	08S066C(03)	I	I	I	R			
107	8S66C on SCE private lands from gate to 8S302	08S066C(04)	I	I	I	R			
184	Road over Dam 2	08S066X	I	I	A	R			
186	8S082 access to Hydro offices at Big Creek	08S082	I	I	A*	R	X*		
1	8S082A access to Hydro offices at Big Creek	08S082A	I	I	A*	R	X*		
249	Access road to Warehouse	08S082AA	I	I	A*	R	X*		
185	8S082B access to Powerhouse No. 1	08S082B(02)	I	I	A*	R	X*		
248	Upper access road to Wastewater treatment plant from 8S82B	08S082BA	I	I	A*	R	X*		

Table 3.1.5-3. Operation and Maintenance Activities Conducted Along Project Roads and Trails Associated with the Four Big Creek ALP Projects (continued).

SCE Map No.	SCE Road Name/Description	USFS Road No.	SCE Operation & Maintenance Activities						
			Road Repair/ Clearing						
			Grading	Gravel/ Paving	Snow Removal/Sanding	Culverts/Ditches/Water Bars	Signage	Fencing	Gates
Big Creek Nos. 1 and 2 Project (FERC No. 2175) (continued)									
Roads (continued)									
247	Lower access road to Wastewater treatment plant from 8S82B	08S082BB	I	I	A*	R	X*		
245	Access road to Fish Farm upper gate	08S082BC	I	I	A*	R	X*		
188	8S082C access to Hydro offices at Big Creek	08S082C	I	I	A*	R	X*		
187	8S082D access to Hydro offices at Big Creek	08S082D	I	I	A*	R	X*		
250	Upper access road to SCE company housing	08S082E	I	I	A*	R	X*		
252	Lower access road to SCE company housing	08S082EA	I	I	A*	R	X*		
251	Access road to Domestic water treatment plant from FRE 2710	08S082F	I	I	A*	R	X*		
246	Upper access road to Powerhouse No. 1 from FRE 2710	08S082J	I	I	A*	R	X*		
189	8S082X access to Hydro offices at Big Creek	08S082X	I	I	A*	R	X*		
48	8S83 from 8S66 to 8S83A	08S083	I	I		R			
200	8S83A, connector road between 8S66C and 8S83	08S083A	I	I					
28	8S301 from gate with 8S66C to penstock surge pipes	08S301	I	I	I	R			X
47	8S302, access to Big Creek No. 1 42-inch gatehouse	08S302	I	I	I	R	X*		
Trail									
261	Trail to Scott Lake Domestic Diversion	NA	I			I			
Big Creek No. 2A, 8 and Eastwood Project (FERC No. 67)									
Roads									
68	Mono Creek Diversion access road	05S080Z	I			I			
4	7S01B Access road to Florence Work Camp	07S001B(02)	I	I	R	R	X*		X
219	7S01BA Florence Work Camp road from 7S01B	07S001BA	I	I	R	R	X*		X
71	7S370D Access road to Florence Dam and water storage tank from 7S370	07S370D	R	I		R			X
237	7S370F Access road to Florence Dam from 7S370	07S370F	I			I			
54	8S02 from Highway 168 to 8S02B	08S002(01)							
54	8S02 from Highway 168 to 8S02B	08S002(02)	I*			I*			X
197	8S02B Access to Huntington-Pitman-Shaver tunnel adit	08S002B	I						
33	8S03 (from 8S05, Canyon Road, to 8S03A, Powerhouse No. 8 access road)	08S003(01)	I	I	A	R	X*	X*	
166	Access road to Powerhouse No. 8 from 8S03	08S003A	I	I	A	R	X*	X*	
21	8S05, Canyon Road (from Powerhouse No. 2 and 8S05E to Powerhouse No. 8)	08S005(01)	I	I	A	R	X*	X*	X

Table 3.1.5-3. Operation and Maintenance Activities Conducted Along Project Roads and Trails Associated with the Four Big Creek ALP Projects (continued).

SCE Map No.	SCE Road Name/Description	USFS Road No.	SCE Operation & Maintenance Activities						
			Road Repair/ Clearing						
			Grading	Gravel/ Paving	Snow Removal/Sanding	Culverts/Ditches/Water Bars	Signage	Fencing	Gates
Big Creek No. 2A, 8 and Eastwood Project (FERC No. 67) (continued)									
Roads (continued)									
77	8S05F Access road to Powerhouse No. 8 penstock from 8S05	08S005F	I	I		R			
157	8S05FB Access road to Powerhouse No. 8 penstock from 8S05F	08S005FB	I	I		R			
167	Road to communication line near Powerhouse No. 8	08S005L	I	I		I			
69	Access road south from Railroad Grade to West Portal	08S008A	R	I		R			X
41	8S13 from the gate to 8S05, Canyon Road	08S013(02)	I	I	A	R	X*		X
258	8S47 Access road to Eastwood Powerstation Transmission Line tower - from gate to end	08S047(02)	R			R			
48	8S83 from 8S83A to Huntington Shaver Siphon	08S083	I	I		R			
56	Pitman Creek Diversion access road	08S094	I*	I*	A*	R*			X
174	8S303 Access road to Eastwood Overflow Campground	08S303	I	I		R			
156	9S03 from 8S08 to FRE 2710	09S003(01)	R	I		R			
262	9S17 access road to Eastwood Transmission line from Hwy 168	09S017	I	I	I	R	X*		
55	9S24 from Hwy 168 to North Fork Stevenson Creek gate No. 2 (Tunnel No. 7 Outlet)	09S024	I	I	A	R			X
89	9S32 from gate near Highway 168 to EPH Transmission Line	09S032	I	I	A	R			X
50	9S32A, spur from 9S32 to east side of Balsam Forebay	09S032A	I	I	R	R			
153	9S32AB, spur from 9S32A to Balsam Forebay	09S032AB	I	I	R	R			
170	Road below Balsam Forebay Dam	09S032C	R			R			
208	9S32CA Access road to Eastwood Powerstation Transmission Line tower	09S032CA	R			R			
232	9S32CB Access road to Eastwood Powerstation Transmission Line tower	09S032CB	R			R			
242	9S32CC Access road to Eastwood Powerstation Transmission Line tower	09S032CC	R			R			
231	9S32CD Access road to Eastwood Powerstation Transmission Line tower	09S032CD	R			R			
230	9S32CE Access road to Eastwood Powerstation Transmission Line tower	09S032CE	R			R			

Table 3.1.5-3. Operation and Maintenance Activities Conducted Along Project Roads and Trails Associated with the Four Big Creek ALP Projects (continued).

SCE Map No.	SCE Road Name/Description	USFS Road No.	SCE Operation & Maintenance Activities						
			Road Repair/ Clearing						
			Grading	Gravel/ Paving	Snow Removal/Sanding	Culverts/Ditches/Water Bars	Signage	Fencing	Gates
Big Creek No. 2A, 8 and Eastwood Project (FERC No. 67) (continued)									
Roads (continued)									
241	9S32CF Access road to Eastwood Powerstation Transmission Line tower	09S032CF	R			R			
84	9S58 from Shaver Marina to North Fork Stevenson Gage	09S058	I	I	A*	R	X*	X*	X
114	Access road to Eastwood Power Tunnel entrance	09S058K	I	I	A*	R	X*	X*	X
243	9S311 Access to Eastwood Powerstation Transmission Line tower	09S311(01)	R	I		R			X
243	9S311 Access to Eastwood Powerstation Transmission Line tower	09S311(02)	R	I		R			
244	9S311A Access to Eastwood Powerstation Transmission Line tower	09S311A	R			R			
19	9S312 access to Eastwood Substation from Highway 168	09S312	I	I	A	R			X
2	Camp Edison Roads	NA	I	I	A	R			
83	Access road to Shaver Dam north	NA	I		A*	R	X*	X*	X
49	Access road to Shaver Dam south	NA	I		A*	R	X*	X*	X
109	Access road to Eagle Point Boat Only Day Use Area from 9S58	NA	I			I			
110	Access road to Eastwood Tailrace	NA	I			I			
115	Access Tunnel to Eastwood Power Station	NA	I	I	A*	R	X*	X*	X
Trails									
265	Trails to North-South Slide Creek Diversions	NA							
108	Trail to Pitman Creek Gage near Tamarack Mountain (below shaft)	NA	R			R			
74	Trail to Big Creek Gage below Dam 5	NA	R			R			
91	Trail to Bolsillo Creek Gage above Intake	NA	R			R			
12	Trail to Camp 62 Creek Gage and Diversion Dam	NA	R			R			
259	Trail to South Fork San Joaquin River Gage downstream of Jackass Meadow	NA	I			I			
260	Trail to Chinquapin Creek Gage and Diversion Dam	NA	R			R			
92	Trial to Bear Creek Gage upstream of Bear Forebay	28E01	R			R			
14	Trail to Tombstone Creek Diversion	NA							

Table 3.1.5-3. Operation and Maintenance Activities Conducted Along Project Roads and Trails Associated with the Four Big Creek ALP Projects (continued).

SCE Map No.	SCE Road Name/Description	USFS Road No.	SCE Operation & Maintenance Activities						
			Road Repair/ Clearing						
			Grading	Gravel/ Paving	Snow Removal/Sanding	Culverts/Ditches/Water Bars	Signage	Fencing	Gates
Big Creek No. 2A, 8 and Eastwood Project (FERC No. 67) (continued)									
Trails (continued)									
88	Trail from Jackass Meadow Campground to Florence Dam outlet and Gage	NA	I			I			
86	Trail to Crater Creek Diversion Ditch (off of the Dutch Lake Trail)	NA	I			I			
17	Two trails to Stevenson Creek Gage below Shave Lake Dam	NA	R			R			
Big Creek No. 3 Project (FERC No. 120)									
Roads									
21	8S05, Canyon Road (from junction with 8S03 to junction with Italian Bar Road)	08S005(03)	I	I	A	R	X*	X*	X
72	Access road to Powerhouse No. 3 penstocks and gate house downhill from 8S05, Canyon Road	08S005A	I	I		R			
217	8S05B Access road to Powerhouse No. 3 penstock from 8S05 Canyon Road	08S005B	R			R			
119	8S05G Access road to Powerhouse No. 3 surge chamber uphill from 8S05 Canyon Road	08S005G	I	I		R			
24	8S05T Access to tailings	08S005T	R	I		R			
29	8S05TA Access to tailings	08S005TA	R	I		R			
216	9S20 Access to Carpenter shop	09S020		I		I	X*	X*	X
85	9S20A Access road to transmission line tower	09S020A	I	I		R	X*	X*	X
62	9S20B Access road to transmission line tower	09S020B	I	I		R	X*	X*	X
64	9S20C Connector road between 9S20 loop	09S020C	R	I		R			
13	9S20D Access to Carpenter Shop	09S020D	R	I		R			
257	9S20DA Access to Garage and shops	09S020DA	R	I		R			
51	9S20E Access to material yard	09S020E	R	I		R			
87	9S20F Connector road between 9S20 loop	09S020F	I	I		R			
127	9S88 from Italian Bar Road to old company housing	09S088	I	I		R	X*	X*	X
5	9S88A Access to old company housing	09S088A	R	I		R			
256	9S88X Access road to Powerhouse No. 3 water tank and shop	09S088X	I	I		R	X*	X*	X

Table 3.1.5-3. Operation and Maintenance Activities Conducted Along Project Roads and Trails Associated with the Four Big Creek ALP Projects (continued).

SCE Map No.	SCE Road Name/Description	USFS Road No.	SCE Operation & Maintenance Activities						
			Road Repair/ Clearing						
			Grading	Gravel/ Paving	Snow Removal/Sanding	Culverts/Ditches/Water Bars	Signage	Fencing	Gates
Big Creek No. 3 Project (FERC No. 120) (continued)									
Roads (continued)									
215	9S88XA Access road to old company housing from 9S88X	09S088XA	R			R	X*	X*	
61	9S89 Access road to Powerhouse No. 3 administrative bldg. from Italian Bar Road	09S089	I	I		R	X*	X*	X
59	9S89BA Access road to Powerhouse No. 3 and switchyard	09S089BA	I	I		R			

X - Done
A - Annual (activity typically occurs each year)
R - Regular (activity will occur one or more times in a 5-year period)
I - Infrequent (activity typically occurs during a 20-year period, but less than once every 5 years)
* Activity occurs at less than 50% at this type of facility in the Big Creek Study Area
NA = Not Applicable
(1) Road also included in FERC boundary of Big Creek Nos. 1 and 2 Project (FERC Project No. 2175).

Table 3.1.5-4. Existing Sediment Management and Operational Practices in the Vicinity of the Four Big Creek ALP Projects.

	Sediment Control				Facility Testing		Project Operations	
	Physical Removal		Mechanical Control					
	Hand	Equipment	Sediment Trap/ Sand Box	Hydraulic Sluicing	Tunnel Inspection	Gate/Valve Testing	High Flow Release	Channel-Riparian Maintenance Flow
Mammoth Pool (FERC Project No. 2085)								
Large Dams								
Mammoth Pool							R[4]	
Moderate Diversion Dams								
San Joaquin River Dam 6		I[3]		I[3]	I[3]	R[2]		
Small Diversions								
Rock Creek	R[3]	I[3]				A[3]		
Ross Creek	R[3]	I[3]				A[3]		
Big Creek Nos. 1 and 2 (FERC Project No. 2175)								
Large Dams								
Huntington Lake Dams 1, 2, 3, 3a								
Moderate Diversion Dams								
Big Creek Dam 4					I[3]	R[2]		
Small Diversions								
Ely Creek	A[5]	I[5]				A[3]		
Adit No. 8	I[3]							
Big Creek 2A, 8 and Eastwood (FERC Project No. 67)								
Large Dams								
Florence Lake								
Shaver Lake							R[4]	
Moderate Diversion Dams								
Bear Creek Diversion		A[2]						
Mono Creek Diversion		A[2],I[3]						
Hooper Creek		A[2],I[3]						
Pitman Creek		I[2]	A[1]					
Balsam								
Big Creek Dam 5		I[3]			I[3]	R[2]		
Small Diversions								
Tombstone Creek								
North Slide Creek								
South Slide Creek								
Crater Creek								
Chinquapin Creek	A[4]					A[5]		
Camp 62 Creek	A[1]					A[5]		
Bolsillo Creek	A[1]					A[5]		
Balsam Creek	A[1]					A[3]		

A=Annual (activity typically occurs each year)
R=Regular (activity typically will occur one or more times in a 5-year period)
I=Infrequent (activity typically will occur during a 20-year period, but less than once every 5 years)

[1]Spring
[2]Summer
[3]Fall
[4]Spring/Summer
[5]Spring/Fall

Table 3.1.7-1. Existing and Recommended Minimum Instream Flow Requirements under the Proposed Action and CDFG Alternative.[1]

Stream Reach	Proposal	Water Year Types	Month																					
			Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept	
			InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]
Mammoth Pool (FERC Project No. 2085)																								
San Joaquin River - Mammoth Pool to Dam 6	Existing (No Action)	Wet, Above Normal	25	none	10	none	10	none	10	none	10	none	10	none	10/25	none	25	none	25	none	30	none	30	none	30/25	none
	Existing (No Action)	Below Normal, Dry, and Critical	12.5	none	10	none	10	none	10	none	10	none	10	none	10/12.5	none	12.5	none	12.5	none	30	none	30	none	30/12.5	none
	Proposed Action	All Years	72	80	72	80	50	55	50	55	50	55	72	80	112	125	112	125	112	125	90	100	90	100	72	80
	CDFG Alternative	Wet, Above Normal	120	none	100	none	80	none	75	none	75	none	75	none	120	none	150	none	150	none	120	none	120	none	120	none
	CDFG Alternative	Below Normal, Dry, and Critical	100	none	100	none	80	none	60	none	60	none	60	none	120	none	120	none	100	none	100	none	100	none	100	none
Rock Creek, below the Diversion	Existing (No Action)	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
	Proposed Action	All Years	0.35	0.5	0.35	0.5	0.35	0.5	0.75	1	0.75	1	0.75	1	1.5	2	1.5	2	1.5	2	0.75	1	0.35	0.5	0.35	0.5
	CDFG Alternative	Wet, Above Normal	2	none	2	none	2	none	2	none	2	none	4	none	4	none	4	none	3	none	2	none	2	none	2	none
	CDFG Alternative	Below Normal, Dry, and Critical	2	none	2	none	2	none	2	none	2	none	3	none	3	none	3	none	2	none	2	none	2	none	2	none
Ross Creek, below the Diversion	Existing (No Action)	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
	Proposed Action	Wet, Above Normal, Below Normal	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5
	Proposed Action	Dry, Critical	Turned Out	Turned Out	Turned Out	none	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	Turned Out	Turned Out	Turned Out	Turned Out	Turned Out	Turned Out
	CDFG Alternative	Wet, Above Normal	1	none	1	none	1	none	1	none	1	none	2	none	3	none	3	none	2	none	1	none	1	none	1	none
	CDFG Alternative	Below Normal, Dry, and Critical	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	2	none	2	none	2	none	1	none	0.5	none	0.5	none	0.5	none
Big Creek No. 1 and 2 (FERC Project 2175)																										
Big Creek, Huntington Lake to Dam 4	Existing (No Action)	All Years	2	none	2	none	2/0	none	0	none	0	none	0	none	0/2	none	2	none	2	none	2	none	2	none	2	none
	Proposed Action	All Years	1.5	2	1.5	2	1.5	2	1.5	2	1.5	2	1.5	2	Fully Open	none	Fully Open	none	Fully Open	none	2	3	2	3	2	3
	CDFG Alternative[3]	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Big Creek Dam 4 to Dam 5	Existing (No Action)	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
	Proposed Action	All Years	6	8	5	7	5	7	5	7	5	7	5	7	10	12	10	12	10	12	10	12	10	12	10	12
	CDFG Alternative	Wet, Above Normal	10	none	7	none	7	none	7	none	7	none	7	none	20	none	20	none	20	none	15	none	15	none	15	none
	CDFG Alternative	Below Normal, Dry, and Critical	7	none	7	none	7	none	7	none	7	none	7	none	15	none	15	none	15	none	10	none	10	none	10	none
Balsam Creek, Diversion to Big Creek	Existing (No Action)	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
	Proposed Action	All Years	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.75	1	0.75	1	0.75	1
	CDFG Alternative	Wet, Above Normal	2	none	1	none	1	none	1	none	1	none	2	none	3	none	3	none	2	none	2	none	2	none	2	none
	CDFG Alternative	Below Normal, Dry, and Critical	1	none	1	none	1	none	1	none	1	none	1	none	2	none	2	none	1	none	1	none	1	none	1	none

Table 3.1.7-1. Existing and Recommended Minimum Instream Flow Requirements under the Proposed Action and CDFG Alternative.[1]

Stream Reach	Proposal	Water Year Types	Month																					
			Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept	
			InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]
Big Creek No. 1 and 2 (FERC Project 2175) (continued)																								
Ely Creek	Existing (No Action)	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
	Proposed Action	All Years	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.75	1	1.5	2	1.5	2	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5
	CDFG Alternative	Wet, Above Normal	1	none	1	none	1	none	1	none	1	none	1	none	3	none	3	none	3	none	2	none	2	none	1	none
	CDFG Alternative	Below Normal, Dry, and Critical	1	none	1	none	1	none	1	none	1	none	1	none	2	none	2	none	1	none	1	none	1	none	1	none
Big Creek 2A, 8 and Eastwood (FERC Project No. 67)																								
SF San Joaquin River, Florence Lake to Bear Creek	Existing (No Action)	Wet, Above Normal	17	none	15	none	15	none	15	none	15	none	15	none	15	none	27	none	27	none	27	none	27	none	27	none
	Existing (No Action)	Below Normal, Dry, and Critical	13	none	11	none	11	none	11	none	11	none	11	none	11	none	20	none	20	none	20	none	20	none	20	none
	Proposed Action	All Years	27	30	22	25	22	25	22	25	22	25	22	25	36	40	36	40	36	40	32	35	32	35	32	35
	CDFG Alternative	Wet, Above Normal	40	none	35	none	30	none	30	none	30	none	30	none	45	none	45	none	45	none	40	none	40	none	40	none
	CDFG Alternative	Below Normal, Dry, and Critical	35	none	35	none	25	none	25	none	25	none	25	none	40	none	40	none	40	none	35	none	35	none	35	none
Bear Creek, below the Diversion	Existing (No Action)	Wet, Above Normal	2	none	2	none	2	none	2	none	2	none	2	none	2	none	3	none	3	none	3	none	3	none	3	none
	Existing (No Action)	Below Normal, Dry and Critical	1	none	1	none	1	none	1	none	1	none	1	none	1	none	2	none	2	none	2	none	2	none	2	none
	Proposed Action	All Years	5	7	5	7	4	6	3	4	3	4	3	4	8	10	8	10	8	10	5	7	5	7	5	7
	CDFG Alternative	Wet, Above Normal	7	none	7	none	6	none	4	none	4	none	4	none	12	none	12	none	10	none	8	none	7	none	7	none
	CDFG Alternative	Below Normal, Dry, and Critical	7	none	7	none	5	none	4	none	4	none	4	none	10	none	10	none	9	none	7	none	7	none	7	none
Mono Creek, Downstream of Mono Diversion	Existing (No Action)	Wet, Above Normal	9	none	7.5	none	7.5	none	7.5	none	7.5	none	7.5	none	7.5	none	13	none	13	none	13	none	13	none	13	none
	Existing (No Action)	Below Normal, Dry and Critical	6	none	5	none	5	none	5	none	5	none	5	none	5	none	9	none	9	none	9	none	9	none	9	none
	Proposed Action	All Years	22	25	22	25	22	25	16	18	16	18	16	18	22	25	22	25	22	25	27	30	27	30	22	25
	CDFG Alternative	Wet, Above Normal	30	none	25	none	20	none	20	none	20	none	30	none	35	none	35	none	30	none	30	none	30	none	30	none
	CDFG Alternative	Below Normal, Dry, and Critical	25	none	25	none	20	none	20	none	20	none	20	none	30	none	30	none	25	none	25	none	25	none	25	none
Bolsillo Creek, below the Diversion	Existing (No Action)	All Years	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none	0.4	none
	Proposed Action	All Years	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.75	1	0.75	1	0.75	1	0.35	0.5	0.35	0.5	0.35	0.5
	CDFG Alternative	Wet, Above Normal	1	none	1	none	1	none	1	none	1	none	1	none	3	none	4	none	4	none	3	none	2	none	1	none
	CDFG Alternative	Below Normal, Dry and Critical	1	none	1	none	1	none	1	none	1	none	1	none	3	none	3	none	3	none	1	none	1	none	1	none

Table 3.1.7-1. Existing and Recommended Minimum Instream Flow Requirements under the Proposed Action and CDFG Alternative.[1]

Stream Reach	Proposal	Water Year Types	Month																					
			Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept	
			InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]
Big Creek 2A, 8 and Eastwood (FERC Project No. 67) (continued)																								
Camp 62 Creek, below the Diversion	Existing (No Action)	All Years	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none
	Proposed Action	All Years	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.75	1	0.75	1	0.75	1	0.35	0.5	0.35	0.5	0.35	0.5
	CDFG Alternative	Wet, Above Normal	1	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	5	none	5	none	5	none	2	none	2	none	1	none
	CDFG Alternative	Below Normal, Dry, and Critical	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	4	none	4	none	4	none	1	none	1	none	1	none
Camp 61[2]	Proposed Action	Wet, Above Normal, Below Normal	1.5	2	1.5	2	1.5	2	1.5	2	1.5	2	1.5	2	3	4	3	4	3	4	2	3	2	3	2	3
	Proposed Action	Dry, Critical	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25	0.75	1.25
Chinquapin Creek, below the Diversion	Existing (No Action)	All Years	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	1	none	1	none	1	none	1	none	1	none
	Proposed Action	All Years	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.35	0.5	0.75	1	0.75	1	0.75	1	0.35	0.5	0.35	0.5	0.35	0.5
	CDFG Alternative	Wet, Above Normal	1	none	1	none	1	none	0.5	none	0.5	none	0.5	none	3	none	3	none	2	none	1	none	1	none	1	none
	CDFG Alternative	Below Normal, Dry, and Critical	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	2	none	2	none	2	none	1	none	1	none	1	none
Crater Creek, below the Diversion	Existing (No Action)	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
	Proposed Action[6]	All Years	Remove Diversion From Service																					
	CDFG Alternative	Wet, Above Normal	2	none	2	none	2	none	2	none	2	none	2	none	8	none	8	none	6	none	4	none	3	none	2	none
	CDFG Alternative	Below Normal, Dry, and Critical	2	none	2	none	2	none	2	none	2	none	2	none	5	none	5	none	5	none	2	none	2	none	2	none
North Slide Creek, Diversion to SF San Joaquin River	Existing (No Action)	All Years	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none
	Proposed Action[6]	All Years	Remove Diversion From Service																					
	CDFG Alternative	Wet, Above Normal	1	none	1	none	1	none	1	none	1	none	1	none	3	none	2	none	1	none	1	none	1	none	1	none
	CDFG Alternative	Below Normal, Dry, and Critical	0.75	none	0.75	none	0.75	none	0.75	none	0.75	none	0.75	none	2	none	2	none	0.75	none	0.75	none	0.75	none	0.75	none
South Slide Creek, below the Diversion	Existing (No Action)	All Years	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none	0.2	none
	Proposed Action[6]	All Years	Remove Diversion From Service																					
	CDFG Alternative	Wet, Above Normal	1	none	1	none	1	none	1	none	1	none	1	none	3	none	2	none	1	none	1	none	1	none	1	none
	CDFG Alternative	Below Normal, Dry, and Critical	0.75	none	0.75	none	0.75	none	0.75	none	0.75	none	0.75	none	2	none	2	none	0.75	none	0.75	none	0.75	none	0.75	none
Tombstone Creek, below the Diversion	Existing (No Action)	All Years	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
	Proposed Action[6]	All Years	Remove Diversion From Service																					
	CDFG Alternative	Wet, Above Normal	6	none	4	none	4	none	4	none	4	none	4	none	6	none	6	none	6	none	6	none	6	none	6	none
	CDFG Alternative	Below Normal, Dry, and Critical	4	none	3	none	3	none	3	none	3	none	3	none	4	none	4	none	4	none	4	none	4	none	4	none

Table 3.1.7-1. Existing and Recommended Minimum Instream Flow Requirements under the Proposed Action and CDFG Alternative.[1]

Stream Reach	Proposal	Water Year Types	Month																					
			Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept	
			InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]
Big Creek 2A, 8 and Eastwood (FERC Project No. 67 (continued)																								
Hooper Creek, below the Diversion	Existing (No Action)	All Years	2	none	2	none	2	none	2	none	2	none	2	none	2	none	2	none	2	none	2	none	2	none	2	none
	Proposed Action	All Years	1.5	2	1.5	2	1.5	2	1.5	2	1.5	2	1.5	2	3	4	3	4	3	4	2	3	2	3	2	3
	CDFG Alternative	Wet, Above Normal	3	none	2	none	2	none	2	none	2	none	2	none	6	none	6	none	6	none	4	none	4	none	3	none
	CDFG Alternative	Below Normal, Dry, and Critical	2	none	2	none	2	none	2	none	2	none	2	none	4	none	4	none	4	none	3	none	3	none	3	none
Balsam Creek, Forebay to Balsam Creek Diversion	Existing (No Action)	All Years	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	0.5	none	1	none	1	none	1	none	1	none
	Proposed Action	All Years	0.75	1	0.75	1	0.75	1	0.75	1	0.75	1	0.75	1	1.5	2	1.5	2	1.5	2	0.75	1	0.75	1	0.75	1
	CDFG Alternative	Wet, Above Normal	2	none	1.5	none	1.5	none	1.5	none	1.5	none	1.5	none	3	none	4	none	3	none	2	none	2	none	2	none
	CDFG Alternative	Below Normal, Dry, and Critical	1.5	none	1.5	none	1.5	none	1.5	none	1.5	none	1.5	none	3	none	3	none	3	none	1.5	none	1.5	none	1.5	none
Big Creek Dam 5 to San Joaquin River	Existing (No Action)	Wet, Above Normal	3	none	3/2	none	2	none	2	none	2	none	2	none	3	none	3	none	3	none	3	none	3	none	3	none
	Existing (No Action)	Below Normal, Dry and Critical	2	none	2/1	none	1	none	1	none	1	none	1	none	2	none	2	none	2	none	2	none	2	none	2	none
	Proposed Action	All Years	6	8	5	7	5	7	5	7	5	7	5	7	10	12	10	12	10	12	10	12	10	12	10	12
	CDFG Alternative	Wet, Above Normal	10	none	8	none	8	none	8	none	8	none	8	none	20	none	20	none	20	none	15	none	15	none	10	none
	CDFG Alternative	Below Normal, Dry, and Critical	8	none	8	none	8	none	8	none	8	none	8	none	15	none	15	none	15	none	10	none	10	none	10	none
NF Stevenson Creek, below tunnel 7 to Shaver Lake	Existing (No Action)	Wet, Above Normal	4	none	4	none	4	none	3.5	none	3.5	none	3.5	none	5	none	5	none	5	none	4.5	none	4.5	none	4.5	none
	Existing (No Action)	Below Normal, Dry, and Critical	3	none	3	none	3	none	3	none	3	none	3	none	4	none	4	none	4	none	3.5	none	3.5	none	3.5	none
	Proposed Action	All Years	12	none	12	none	12	none	12	none	12	none	12	none	12	none	12	none	12	none	12	none	12	none	12	none
	CDFG Alternative	Wet, Above Normal	12	none	12	none	12	none	8	none	8	none	8	none	25	none	25	none	20	none	15	none	15	none	12	none
	CDFG Alternative	Below Normal, Dry, and Critical	12	none	12	none	12	none	8	none	8	none	8	none	20	none	20	none	20	none	12	none	12	none	12	none
Pitman Creek, below the Diversion	Existing (No Action)	All Years	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none	0.3	none
	Proposed Action	All Years	0.5	0.8	0.5	0.8	0.5	0.8	0.5	0.8	0.5	0.8	0.5	0.8	2	2.5	2	2.5	2	2.5	0.5	0.8	0.5	0.8	0.5	0.8
	CDFG Alternative	Wet, Above Normal	2	none	1.5	none	1.5	none	1.5	none	1.5	none	1.5	none	5	none	5	none	5	none	3	none	2	none	2	none
	CDFG Alternative	Below Normal, Dry, and Critical	1.5	none	1.5	none	1.5	none	1.5	none	1.5	none	1.5	none	3	none	3	none	3	none	1.5	none	1.5	none	1.5	none

Table 3.1.7-1. Existing and Recommended Minimum Instream Flow Requirements under the Proposed Action and CDFG Alternative.[1]

Stream Reach	Proposal	Water Year Types	Month																					
			Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept	
			InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]	InstQ[4]	AvgQ[5]
Big Creek 2A, 8 and Eastwood (FERC Project No. 67 (continued)																								
Stevenson Creek, Shaver Lake to San Joaquin River	Existing (No Action)	All Years	3	none	3/2	none	2	none	2	none	2	none	2	none	3	none	3	none	3	none	3	none	3	none	3	none
	Proposed Action	All Years	4	5	4	5	4	5	4	5	4	5	4	5	8	10	8	10	8	10	6	8	6	8	6	8
	CDFG Alternative	Wet, Above Normal	8	none	5	none	5	none	5	none	5	none	5	none	15	none	15	none	10	none	8	none	8	none	8	none
	CDFG Alternative	Below Normal, Dry, and Critical	5	none	5	none	5	none	5	none	5	none	5	none	10	none	10	none	9	none	8	none	8	none	8	none
Big Creek No. 3 - FERC Project No. 120																								
San Joaquin River, Dam 6 to Redinger Lake	Existing (No Action)	All Years	3	none	3	none	3	none	3	none	3	none	3	none	3	none	3	none	3	none	3	none	3	none	3	none
	Proposed Action	All Years	45	50	22	25	18	20	18	20	18	20	45	50	72	80	72	80	72	80	54	60	45	50	45	50
	CDFG Alternative	Wet, Above Normal	75	none	25	none	25	none	25	none	25	none	75	none	100	none	100	none	100	none	75	none	75	none	75	none
	CDFG Alternative	Below Normal, Dry, and Critical	50	none	25	none	20	none	20	none	20	none	60	none	80	none	80	none	80	none	60	none	50	none	50	none

[1]Only streams for which minimum instream flows are proposed either in the Proposed Action or CDFG Alternative are included.

[2]Portal Project (FERC Project No. 2174) bypass stream reach

[3]Not included in the CDFG Alternative Proposal

[4]Flow refers to the minimum instantaneous flow, which is the flow value used to construct the average daily flow value measured in time increments of at least 15 minutes.

[5]Avg. refers to the 24-hour average flow of the incremental readings from midnight of one day to midnight of the next day.

[6]Small diversion will be decommissioned under the proposed action.

Table 3.1.7-2. Recommended Channel Riparian Maintenance Flows under the Proposed Action.

Bypass and Flow Augmented Reaches[1]

Stream Reach	Water Year	Implementation Timing	Flow Days 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Big Creek Nos. 2A, 8, and Eastwood Project (FERC Project No. 67)																																
South Fork San Joaquin River (Florence to San Joaquin River)	Wet Years	Release to be made starting between Jun 1 and Jul 7	400	800	1,200	1,600	1,600	1,600	1,000	750	750	500	500	500	150	ramp down[2]																
	AN Years	Release to be completed prior to Memorial Day weekend to the extent feasible	ramp up[3]	peak flow[4]	peak flow[4]	700	500	500	500	ramp down[2]																						
Bear Creek (Diversion to South Fork San Joaquin River)	Wet Years	May 15 to June 30	Starting between May 15 and June 30 in Wet Years, SCE shall not divert water at the Bear Creek Diversion for 10 consecutive days																													
Mono Creek[5] (Diversion to South Fork San Joaquin River)	Wet Years ($V^* > 0.2$)[6]	Release to be made starting between Jul 1 and Aug 5	400	400	400	800	800	800	500	500	350	350	ramp down[2]																			
	Wet Years ($V^* < 0.2$)[6]	Release to be made starting between Jul 1 and Aug 5	ramp up[7]	450	450	450	450	450	450	450	450	ramp down[2]																				
	AN Years	Release to be made starting between Jul 1 and Aug 5	ramp up[7]	ramp up[7]	450	450	345	240	ramp down[2]																							
Bolsillo Creek (Diversion to South Fork San Joaquin River)	Wet Years	April 1 to June 30	Beginning April 1 and June 30 in Wet Years, SCE shall not divert water at the Bolsillo Creek Diversion																													
Camp 62 Creek (Diversion to South Fork San Joaquin River)	Wet Years	April 1 to June 30	Beginning April 1 and June 30 in Wet Years, SCE shall not divert water at the Camp 62 Creek Diversion																													
Chinquapin Creek (Diversion to South Fork San Joaquin River)	Wet Years	April 1 to June 30	Beginning April 1 and June 30 in Wet Years, SCE shall not divert water at the Chinquapin Creek Diversion																													
Portal Project (FERC Project No. 2174)[8]																																
Camp 61 Creek[7] (Diversion to South Fork San Joaquin River)	Wet Years Initial Flow Schedule	Release to be made starting between May 1 and Jun 30	ramp up[7]	28	28	40	40	40	40	28	28	ramp down[2]																				
	AN Years Initial Flow Schedule	Release to be made starting between May 1 and Jun 30	ramp up[7]	22	22	30	30	30	30	22	22	ramp down[2]																				
	Wet Years Modified Flow Schedule[9]	Release to be made starting between May 1 and Jun 30	ramp up[7]	28	28	40	40	40	40	40	40	28	28	ramp down[2]																		
	AN Years Modified Flow Schedule[9]	Release to be made starting between May 1 and Jun 30	ramp up[7]	22	22	30	30	30	30	30	30	22	22	ramp down[2]																		

[1] Only streams for which a specified Channel Riparian Maintenance Flow (CRMF) schedule is proposed are included. NOTE: The existing license conditions (No Action) do not require any scheduled CRMF releases or releases through timing of diversion operations.

[2] Ramp down represents a gradual flow decrease, from the CRMF release to minimum instream flow.

[3] Ramp Up represents gradual flow increase from base flow to a peak flow that will provide approximately 75% of the areal extent of inundation measured at 1,600 cfs.

[4] Peak Flow will provide approximately 75% of the areal extent of inundation measure at 1,600 cfs.

[5] CRMF releases into Mono Creek must begin during the period between July through August 5.

[6] Wet water year CRMF release schedules in Mono Creek are based on V* monitoring results from the last sediment monitoring event.

[7] Ramp up represents a gradual flow increase, over one day, from minimum instream flow to the subsequent days prescribed flow.

[8] Camp 61 Creek is the bypass stream reach associated with the Portal Project that is undergoing the Traditional Licensing Process.

[9] Modified flow release schedule is implemented if the results from sediment monitoring conducted after two wet water year releases yields a V* value greater than 0.25.

Table 3.1.7-3. Sediment Issues and Proposed Sediment Management Prescriptions for the Four Big Creek ALP Projects.[1]

Facility	FERC Project Number(s)	Sediment Issue	Sediment Management Prescriptions and Monitoring
Balsam Creek Diversion Bolsillo Creek Diversion Camp 62 Diversion Chinquapin Creek Diversion Hooper Creek Diversion Pitman Creek Diversion Ross Creek Diversion Rock Creek Diversion Ely Creek Diversion	67 67 67 67 67 67 2085 2085 2175	Accumulation of sediment behind the diversion may block the intake structure.	**Sediment Pass Through[2,3]** To reduce the accumulation of sediment behind the diversion, the low-level outlet will be opened during each spring runoff period in wet years when the diversion is turned out. **Physical Removal of Sediment** If necessary, physical removal of sediment by hand or equipment will be conducted during the low flow period in the spring prior to runoff, or in the fall. If feasible, any trapped sediment will be removed. Sediments removed from the channel will be either placed above the high water elevation (mean annual flood elevation) where they will not be re-entrained or the sediments will be removed to an offsite location, which will be pre-approved by the USDA-FS and CDFG if the agencies have jurisdiction over the disposal location.
Dam 4 Forebay	2175	Accumulation of sediment behind the dam may block the low-level outlet valves or intake structure.	**Sediment Pass Through[2,3]** Within five years of approval of this sediment prescription by FERC, SCE will implement the sediment pass through activities. This prescription will be implemented subsequently at least once every five years thereafter. Sediment pass through activities will be completed over one or two days and will occur between January 1 and March 31. SCE will open the low-level outlet and repeatedly fluctuate the water surface elevation (WSE) of the forebay, between the elevation of the tunnel invert intake and the low-level outlet. This approach will assist in mobilization of sediment from the banks of the forebay. During implementation of the sediment pass through prescription, a flow not less than the minimum instream flow (MIF) downstream of the dam will be maintained through the low-level outlet (opened at its maximum capacity). Following the first day of implementation, the licensee will inspect the forebay for the presence of residual sediment and determine if a second day of sediment pass through activities are necessary. If it is determined that a second day is necessary, the approach described above will be implemented for a second day. After sediment pass through is completed and the low-level outlet has been closed, a minimum of 600 cfs will be spilled over the dam for at least 24 hours (clear water release). This additional release will allow for continued mobilization of sediment downstream. **Monitoring** Monitoring of pools downstream of the dam will be conducted prior to, and after implementation of the prescription, to determine if the sediment prescription has resulted in deposition of fine sediment in the stream. The weighted mean value of the level of fine sediments (V^*_w) in a representative set of five pools below the diversion will be measured according to the procedures defined by Hilton and Lisle (1993). V^*_w values shall be initially determined (baseline condition) prior to implementation of the sediment management prescription. Additional V^*_w will be determined following implementation of the sediment prescription. The monitoring measurement locations will be approved by the USDA-FS, CDFG and the State Water Resources Control Board (State Water Board) and other interested governmental agencies. When scheduling sampling site selection or field data collections, SCE will give interested governmental agencies 30-days advance notice to provide them with the opportunity to participate or observe. If field conditions or operational situations preclude a 30-day notification, SCE will provide notice as far in advance as feasible.

Table 3.1.7-3. Sediment Issues and Proposed Sediment Management Prescriptions for the Four Big Creek ALP Projects.[1]

Facility	FERC Project Number(s)	Sediment Issue	Sediment Management Prescriptions and Monitoring
Dam 4 Forebay	2175	Accumulation of sediment behind the dam may block the low-level outlet valves or intake structure.	**Monitoring (continued)** V^*_w results will be reported to the USDA-FS, CDFG and State Water Board, and other interested government agencies within six months of completing sediment prescriptions[4]. Following submittal of the monitoring results, SCE will consult with USDA-FS, CDFG and State Water Board and other interested government agencies to determine if modifications to the sediment prescription are warranted. Monitoring will be discontinued in subsequent years, upon approval of the USDA-FS, CDFG and State Water Board. SCE will also monitor turbidity during implementation of sediment prescriptions at three locations (upstream of the forebay, immediately downstream of the forebay and 1,000 feet downstream of the forebay). Monitoring will be conducted on an hourly basis from 8 hours prior to initiation of sediment prescriptions to at least 8 hours after the clear water release). In each year prior to implementation of sediment prescriptions, SCE will also monitor turbidity during two storm events at the same locations described above. Monitoring during the storm event will be conducted on an hourly basis for 24 hours. Turbidity monitoring results will be reported to the USDA-FS, CDFG and State Water Board and other interested government agencies within six months of completing sediment prescriptions[4]. Following submittal of the monitoring results, SCE will consult with USDA-FS, CDFG and State Water Board and other interested government agencies to determine if modifications to the sediment prescription are warranted. Monitoring will be discontinued in subsequent years, upon approval of the USDA-FS, CDFG and State Water Board.
Dam 5 Forebay	67	Accumulation of sediment behind the dam may block the low level outlet valves or intake structure.	**Sediment Removal and Pass Through[2,3]** Within five years of approval of this sediment prescription by FERC, SCE will implement the sediment prescriptions described below. Any sediment prescriptions will be initiated between January 1 and March 31 and will be implemented at least every five years after the initial implementation. **Sediment Removal** After implementing any sediment pass through prescription, described below, an inspection of the forebay will be conducted to determine if physical removal of sediment is necessary. If SCE determines it to be necessary, SCE will implement this sediment removal prescription. First the low-level outlet will be opened to drawdown the forebay. Once the forebay is drained, SCE will use mechanical equipment (e.g., dozer, excavator) to remove sediment. During sediment removal activities, MIF required downstream of the dam will be maintained. In areas where heavy equipment must cross the channel in the forebay, culverts will be installed. Sediment will be transported to a sediment disposal site pre-selected in consultation with USDA-FS and CDFG if the agencies have jurisdiction over the disposal location. **Sediment Pass Through** Implement sediment pass through prescription as described under Dam 4 Forebay. **Monitoring** Implement monitoring as described under Dam 4 Forebay.

Table 3.1.7-3. Sediment Issues and Proposed Sediment Management Prescriptions for the Four Big Creek ALP Projects.[1]

Facility	FERC Project Number(s)	Sediment Issue	Sediment Management Prescriptions and Monitoring
Dam 6 Forebay	120	Accumulation of sediment behind the dam may block the low-level outlet valves or intake structure.	**Sediment Removal and Pass Through[2,3]** SCE will conduct sediment prescriptions at Dam 6 Forebay at least every five years beginning the year following implementation of sediment prescriptions at Dam 4 and Dam 5. Sediment prescriptions at Dam 6 Forebay will be initiated between January 1 and March 31. **Sediment Removal** An inspection of the forebay will be initiated to determine if physical removal of sediment is necessary. If SCE determines it to be necessary, SCE will implement this sediment removal prescription. During sediment removal, two of the four low-level outlets will be opened to drawdown the forebay. No more than two of the four low-level outlets will be opened at any time. Once the forebay is drained, SCE will use mechanical equipment (e.g., dozer, excavator) to remove sediment. MIF required downstream of the dam will be maintained through the forebay. In areas where heavy equipment must cross the channel in the forebay, culverts will be installed. Sediment will be transported to a sediment disposal site pre-selected in consultation with USDA-FS and CDFG if the agencies have jurisdiction over the disposal location. **Sediment Pass Through** Implement the sediment pass through prescription, as described above under Dam 4 Forebay, with the following modifications. During each forebay WSE fluctuation, a different sequence of two of the four low-level outlets will be opened. During implementation of the sediment pass through prescription, a flow not less than the MIF will be maintained downstream of the dam through the two low-level outlets (opened to their maximum capacities). After the sediment pass through is completed and the low-level outlets have been closed, a minimum of 3,000 cfs will be spilled over the dam for at least 24 hours. This additional release will allow for continued mobilization of sediment downstream. **Monitoring** Implement monitoring as described under Dam 4 Forebay.
Mono Creek Diversion	67	Accumulation of sediment behind the dam may block the outlet valves or intake structure.	**Sediment Removal[2,3]** Within five years of approval of this sediment prescription by FERC, SCE will inspect the forebay to determine if physical removal of sediment is necessary. If physical removal of sediment is necessary, the following prescription will be implemented. Any sediment removal activities will occur in Wet Years prior to the implementation of channel riparian maintenance (CRM) flows. An inspection of the forebay will be completed at least every five years thereafter. The forebay will be drawn down for a period no longer than two weeks between July 1 and August 31 to allow for removal of sediment from the forebay using mechanical equipment. A trench will be created within the forebay from the confluence of Mono Creek and the forebay to the low-level outlet prior to sediment removal activities. This trench will be used to transport the 25 cfs MIF or the maximum flow through the lower level outlet valve, whichever is less. Once the trenching is completed, mechanical equipment will be used to remove sediment from the forebay. This sediment will be transported to a sediment disposal site pre-selected in consultation with USDA-FS and CDFG if the agencies have jurisdiction over the disposal location. Upon completion of the sediment removal, the low-level outlet will be closed and a flow will be spilled over the dam consistent with the CRM flow condition for Mono Diversion for at least 24 hours. Once sediment prescriptions are complete, flows will be returned to the MIF (25 cfs).

Table 3.1.7-3. Sediment Issues and Proposed Sediment Management Prescriptions for the Four Big Creek ALP Projects.[1]

Facility	FERC Project Number(s)	Sediment Issue	Sediment Management Prescriptions and Monitoring
Mono Creek Diversion	67	Accumulation of sediment behind the dam may block the outlet valves or intake structure.	**Sediment Removal[2,3] (continued)** **Monitoring** Fine sediment monitoring will be done in Mono Creek as part of the proposed CRM flow license requirement. SCE will monitor turbidity during implementation of sediment prescriptions at three locations (upstream of the forebay, immediately downstream of the forebay and 1,000 feet downstream of the forebay). Monitoring will be conducted on an hourly basis from 8 hours prior to initiation of sediment prescriptions to at least 8 hours after the clear water release. Turbidity monitoring results will be reported to the USDA-FS, CDFG and State Water Board and other interested government agencies within six months of completing sediment prescriptions[4]. Following submittal of the monitoring results, SCE will consult with USDA-FS, CDFG and State Water Board and other interested government agencies to determine if modifications to the sediment prescription are warranted. Monitoring will be discontinued in subsequent years, upon approval of the USDA-FS, CDFG and State Water Board.
Mammoth Pool Dam	2085	Accumulation of sediment at intake structure leading to Howell-Bunger (HB) valve.	**Sediment Pass Through[2,3]** During wet years, SCE will comply with its whitewater obligations for the Mammoth Pool Project license and the project's Recreation Plan. The operation of the Howell-Bunger (HB) valve to provide pre-spill release flows from Mammoth Pool Reservoir for whitewater boating opportunities may allow sediment accumulated at the intake structure to pass downstream. **Monitoring** SCE will monitor turbidity during implementation of pre-spill release at two locations (downstream of the dam and just upstream of Mammoth Pool Powerhouse). Monitoring will be conducted on an hourly basis from 8 hours prior to initiation of pre-spill releases to 48hours after HB value is opened. Turbidity monitoring results will be reported to the USDA-FS, CDFG and State Water Board and other interested government agencies within six months of completing the monitoring activities. Following submittal of the monitoring results, SCE will consult with USDA-FS, CDFG and State Water Board and other interested government agencies to determine if modifications to the pre-spill release is warranted. Monitoring will be discontinued in subsequent years, upon approval of the USDA-FS, CDFG and State Water Board.
Portal Forebay Balsam Meadow Forebay	2174 67	Accumulation of sediment behind the dam may block low-level outlets or intake structure.	**Sediment Removal[2,3]** Within five years of approval of this sediment prescription by FERC, SCE will inspect the forebays to determine if physical removal of sediment is necessary. If physical removal of sediment is necessary, this prescription will be implemented. An inspection of the forebays will be completed at least every five years thereafter. If necessary, the forebay will be drawn down in the late fall to allow for removal of sediment using mechanical equipment. A trench will be created within the forebay from the point of inflow to the low-level outlet prior to sediment removal activities. This trench will be used to transport the required MIF around the sediment removal area. Once the trenching is completed, mechanical equipment will be used to remove sediment from the forebay. This sediment will be transported to a sediment disposal site pre-selected in consultation with USDA-FS and CDFG if the agencies have jurisdiction over the disposal location. If the licensee determines that "flushing" flows are required as part of the sediment management, such flows will only be released within the time frames and peak magnitudes specified in the Portal CRM flow unless otherwise agreed to by the USDA-FS and other interested governmental agencies.

Table 3.1.7-3. Sediment Issues and Proposed Sediment Management Prescriptions for the Four Big Creek ALP Projects.[1]

Facility	FERC Project Number(s)	Sediment Issue	Sediment Management Prescriptions and Monitoring
Portal Forebay Balsam Meadow Forebay	2174 67	Accumulation of sediment behind the dam may block low-level outlets or intake structure.	**Sediment Removal[2,3] (continued)** **Monitoring** SCE will monitor turbidity during implementation of sediment prescriptions at three locations (upstream of the forebay, immediately downstream of the forebay and 1,000 feet downstream of the forebay). Monitoring will be conducted on an hourly basis from 8 hours prior to initiation of sediment prescriptions to at least 8 hours after the completion of sediment removal activities. Turbidity monitoring results will be reported to the USDA-FS, CDFG and State Water Board and other interested government agencies within six months of completing sediment prescriptions[4]. Following submittal of the monitoring results, SCE will consult with USDA-FS, CDFG and State Water Board and other interested government agencies to determine if modifications to the sediment prescription are warranted. Monitoring will be discontinued in subsequent years, upon approval of the USDA-FS, CDFG and State Water Board.

[1]SCE will consult with the USDA-FS, CDFG and other regulatory agencies regarding information needs and permitting requirements for the sediment activities. If additional information is needed in order to obtain approval of necessary permits, then SCE will provide that information.

[2]Other regulatory or operational constraints may take precedence of sediment management prescriptions. These constraints may include, but not be limited to: (i) necessary repairs to the dam(s) or associated equipment; (ii) providing water supplies during drought periods to downstream water users or for environmental purposes; (iii) operating generating facilities to address power shortages in California due to unscheduled power outages of other power generation facilities, State declared energy emergencies, or orders from a State agency with authority to dispatch power generated by the Projects; (iv) reducing downstream flooding risks; (v) meeting the terms of the Mammoth Pool Operating Contract or other obligations to downstream water rights holders; or (vi) meeting other Project license water release requirements. In the event that sediment management prescriptions are not conducted due to conflicting operational constraints, SCE will make a good faith effort to complete the sediment management prescription(s) in the following year.

[3]SCE will provide notification of Sediment Pass Through or Sediment Removal activities to the USDA-FS, State Water Board, CDFG and other interested parties, including the Whitewater Boating Community, 30 – days prior to commencing work.

[4]Deviations from turbidity standards in the Basin Plan will not be considered violations during the first two cycles of sediment prescriptions, but will be reported to the State Water Board, who will determine whether modifications should be made to the sediment management prescriptions, monitoring programs, or whitewater pre-spill releases contained in this Plan.

Table 3.1.7-4. Major Rehabilitation of Existing Recreation Facilities.

Facility	Year Rehabilitation Activity Begins Post-Settlement Agreement[1]	Years Post-Settlement Agreement (2007)																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Mammoth Pool (FERC Project No. 2085)																												
Mammoth Pool Reservoir																												
Boat Ramp-Mammoth Pool Boat Launch	12												Planning	Designing	Contract	Construction	Construction											
China Bar Boat Camp	16																Planning	Designing	Contract	Construction	Construction							
Mammoth Pool Campground	11											Planning	Designing	Contract	Construction	Construction												
Windy Point Day-Use Picnic Area	14														Planning	Designing	Contract	Construction	Construction									
Windy Point Boat Launch	14														Planning	Designing	Contract	Construction	Construction									
Big Creek Nos. 1 and 2 (FERC Project No. 2175)																												
Huntington Lake																												
Boat Ramp and Parking-Huntington Lake, East	21																					Planning	Designing	Contract	Construction	Construction		
Boat Ramp-Huntington Lake, West	5					Planning	Designing	Contract	Construction	Construction																		
Upper Billy Creek Campground	4				Planning	Designing	Contract	Construction	Construction																			
Lower Billy Creek Campground	4				Planning	Designing	Contract	Construction	Construction																			
Catavee Campground	22																						Planning	Designing	Contract	Construction	Construction	
College Campground	2		Planning	Designing	Contract	Construction	Construction																					
Deer Creek Campground	23																							Planning	Designing	Contract	Construction	Construction
Kinnikinnick Campground	23																							Planning	Designing	Contract	Construction	Construction
Rancheria Campground	1	Planning	Designing	Contract	Construction	Construction																						
Bear Cove Day-Use Picnic Area	4				Planning	Designing	Contract	Construction	Construction																			
Billy Creek Day-Use Picnic Area	4				Planning	Designing	Contract	Construction	Construction																			
Deer Creek Day-Use Picnic Area	23																							Planning	Designing	Contract	Construction	Construction
Dowville Day-Use Picnic Area	3			Planning	Designing	Contract	Construction	Construction																				
Eastwood Overlook and Parking	6						Planning	Designing	Contract	Construction	Construction																	
Big Creek Nos. 2A, 8 and Eastwood (FERC Project No. 67)																												
Florence Lake																												
Boat Ramp-Florence Lake	10										Planning	Designing	Contract	Construction	Construction													
Jackass Meadow Campground	8								Planning	Designing	Contract	Construction	Construction															
Florence Lake Day-Use Picnic Area	10										Planning	Designing	Contract	Construction	Construction													
Shaver Lake																												
Camp Edison Campground[2]																												
Camp Edison Boat Ramp/Launch[2]																												
Dorabelle Campground	3			Planning	Designing	Contract	Construction	Construction																				
Dorabelle Day-Use Picnic Area	3			Planning	Designing	Contract	Construction	Construction																				
Day-Use Areas on North Shore Roads 1 and 2[2]																												
Day-Use Area off of Hwy 168 (The Point)[2]																												
Eagle Point Boat Only Day-Use Area[2]																												
Balsam Meadow Forebay																												
Balsam Meadow Forebay Day Use Picnic Area[2]																												
Balsam Meadow Trailhead and Parking[2]																												
Mono Creek Forebay																												
Mono Creek Campground	17																	Planning	Designing	Contract	Construction	Construction						
Mono Creek Day-Use Picnic Area	17																	Planning	Designing	Contract	Construction	Construction						
Big Creek No. 3 (FERC Project No. 120)																												
Dam 6 Forebay																												
Angler Access Stairway at Mammoth Pool Powerhouse	11											Planning	Designing	Contract	Construction	Construction												
Parking Area near Mammoth Pool Powerhouse Gate	11											Planning	Designing	Contract	Construction	Construction												

Footnotes:
[1] Initiation of the recreation facility rehabilitation schedule is based on the establishment of a settlement agreement in year 2007.
[2] These facilities are maintained by SCE and the rehabilitation of these facilities is conducted on an ongoing basis during the term of the License as part of the routine maintenance and repair activities.

FIGURES

Placeholder for Figures

Figure 3.1.3-1
Mammoth Pool Project FERC Project No. 2085 Current and Proposed FERC Project Boundary

Figures 3.1.3-2 through 3.1.3-5
Big Creek Nos. 1 and 2 (FERC Project No. 2175) Current and Proposed FERC Project Boundary

Figures 3.1.3-6 through 3.1.3-19
Big Creek Nos. 2A, 8, and Eastwood (FERC Project No. 67) Current and Proposed FERC Project Boundary

Figure 3.1.3-20
Big Creek No. 3 (FERC Project No. 120) Current and Proposed FERC Project Boundary

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ELEVATION — FEET

8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000

PORTAL PH
10,800 kW

EL 8,004'

LAKE THOMAS A EDISON
125,035 AF
EL 7,642.5'

HUNTINGTON LAKE
89,166 AF
EL 6,950'

EL 6,998'

HD 230'

WARD TUNNEL

FLORENCE LAKE
64,406 AF, EL 7,327.5'

EL 8,762'

EL 7,350'

EL 7,535'

EL 7,257'

EL 7,273'

EL 7,350'

MONO BEAR SIPHON

PORTAL FOREBAY
325 AF, EL 7,180'

BALSAM MEADOWS FOREBAY
1,547 AF, EL 6,669.9'

HD 2131'

HD 1338'

EL 4,881'

EL 4,845'

EASTWOOD PS
199,800 kW

SHAVER LAKE
135,568 AF, EL 5,370'

BC PH 1
88,150 kW

DAM 4
60 AF
EL 4,810'

EL 4816'

HD 1868'

HD 2418'

BC PH 2
66,500 kW

BC PH 2A
110,000 kW

DAM 5
49 AF
EL 2,943'

HD 713'

BC PH 8
75,000 kW

DAM 6
993 AF
EL 2,230'

HD 827'

MAMMOTH POOL RESERVOIR
119,940 AF
EL 3,330'

EL 3,359'

EL 3,336'

HD 1100'

MAMMOTH POOL PH
190,000 kW

REDINGER LAKE
26,119 AF
EL 1,403'

BC PH 3
174,450 kW

BC PH 4
100,000 kW

HD 418'

PG&E WISHON PH
22,000 kW

USBR
MILLERTON LAKE
503,200 AF
EL 578'

HD 442'

PG&E KERCKHOFF PH2
140,000 kW

PG&E KERCKHOFF PH1
38,000 kW

PG&E KERCKHOFF RESERVOIR
4140 AF, EL 985'

Northern Hydro Region	FERC Nos.	License Expiration	Dependable Operation Capacity (MW)
Big Creek Nos. 1 & 2	2175	02/28/09	150.00
Big Creek Nos. 2A, 8 & Eastwood	67	02/28/09	370.00
Big Creek No. 3	120	02/28/09	181.90
Big Creek No. 4	2017	11/30/39	100.20
Portal*	2174	03/31/05	10.50
Mammoth Pool	2085	11/30/07	187.00
Vermilion Valley*	2086	08/31/03	0.00

* - The Vermilion Valley Project and Portal Project are operating under annual licenses.

Notes: Rated capacities shown
AF = Acre-Feet
HD = Static Head

Figure 3.1.4-1
SCHEMATIC PROFILE
OF THE BIG CREEK SYSTEM
Southern California Edison Company Rosemead, California
November 2005