Hydropower Project License Summary

PIT RIVER, CA

PIT 3, 4, 5 HYDROELECTRIC PROJECT (P-233)

Pit 3 Dam

Photo: Hydropower Reform Coalition

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Hydropower Reform Coalition

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DESCRIPTION:
The 312.33-megawatt (MW) Pit 3, 4, 5 project is located on the Pit River in Shasta County, California. The project occupies 4,330 acres, of which 3,259 acres are owned by PG&E, 746 acres are part of the Shasta National Forest, and 325 are privately owned. It is located in the northeastern portion of Shasta County, approximately 75 miles east of Redding. The Pit's naturally high, cold flows make it one of the finest wild trout fisheries in the state.

A. SUMMARY

1. License application filed: October 19, 2001
2. License Issued: July 2, 2007
3. License expiration: February 28, 2043
4. Capacity: 312.33 MW
5. Waterway: Pit River
6. Counties: Shasta
7. Licensee: Pacific Gas and Electric (PG&E)
8. Agreement: The Pit River Collaborative Team (PRCT) agreement signed in October 2003 addresses reservoir operations, minimum streamflows, freshet flow releases, out-of-season spill flows, recreation streamflow releases, ramping rates, and streamflow information. The agreement was signed by PG&E, FWS, Forest Service, Interior's National Park Service, Parks and Recreation, Cal Fish and Game, Modoc County, South Fork Irrigation District, Trout Unlimited, California Trout, American Whitewater, and Iverson Reservoir.
9. Project Facilities:

The project consists of three developments, with a total of four dams, four reservoirs, three powerhouses. The developments extend along the Pit River, with Pit 3 the furthest upstream and Pit 5 the furthest downstream.

Pit 3 Development

The Pit 3 development includes the 1,293-acre Pit 3 reservoir, known as Lake Britton, with a gross storage capacity of 41,877 acre-feet at elevation 2,737.5 feet National Geodetic Vertical Datum (NGVD) and a usable capacity of 14,443 acre-feet. Lake Britton is impounded by the Pit 3 dam, having a maximum height of 130 feet, a crest length of 494 feet, and a 254-foot-wide spillway with three bays and three gated outlets.

Water from Lake Britton passes into either the Pit 3 powerhouse intake or the Pit 3 bypassed reach, which is about six miles long. The powerhouse intake is connected to a concrete tunnel with two sections, having a total length of 4 miles. Water passing through the tunnel enters a surge chamber and three penstocks en route to the Pit 3

powerhouse, which contains three generating units driven by three vertical Francis turbines, with a total normal operating capacity of 69.9 MW. The Hat Creek fish barrier dam is located on Hat Creek, just upstream of its confluence with Lake Britton.

Pit 4 Development

Water that passes through the Pit 3 powerhouse and Pit 3 bypassed reach converges at the upper end of the 105-acre Pit 4 reservoir, having a usable storage capacity of 1,970 acre-feet at elevation 2,422.5 feet NGVD. The Pit 4 reservoir is impounded by the Pit 4 dam, which comprises an overflow section with a spillway, three sluice gates, a 213-foot-long minimum flow outlet with a maximum height of 115 feet, a 202-foot-long section with a maximum height of 65 feet, and a 115-foot-long wing wall approximately 3 to 5 feet high. Water from the Pit 4 reservoir passes into either the Pit 4 powerhouse intake or the approximately 7.5-mile-long Pit 4 bypassed reach. The powerhouse intake is connected to an approximately 4.1-mile-long pressure tunnel. Water passing through the tunnel enters a surge chamber and two 780-foot-long penstocks en route to the Pit 4 powerhouse, which has two generating units driven by two vertical Francis turbines, with a combined normal operating capacity of 95 MW. The 6.7-mile-long, 230-kV Pit 4 transmission line delivers electricity produced at the Pit 4 powerhouse to PG&E's interconnected transmission system.

Pit 5 Development

Water that passes through the Pit 4 powerhouse and Pit 4 bypassed reach converges at the upper end of the 32-acre Pit 5 reservoir, having a usable storage capacity of 202 acre-feet at elevation 2,040.5 feet NGVD. The Pit 5 reservoir is impounded by the 340-foot-long, 67-foot-high Pit 5 dam, which includes four spill bays. Water from the Pit 5 reservoir passes into either the Pit 5 powerhouse intake or the approximately 9-mile-long Pit 5 bypassed reach. Water that passes into the intake travels through the approximately 0.97 mile-long tunnel No. 1 into the 48-acre Pit 5 Tunnel Reservoir, also known as the open conduit, with a usable storage capacity of 645 acre-feet at elevation 2,040.5 feet NGVD. The Pit 5 Tunnel Reservoir is impounded by the 3,100-foot-long, 66-foot-high Tunnel Reservoir dam. Water passes out of the Pit 5 Tunnel Reservoir into the 4.38 mile-long tunnel No. 2 before entering a surge chamber and four 1,380-foot-long penstocks en route to the powerhouse, which contains four generating units driven by 4 vertical Francis turbines, with a combined normal operating capacity of 160 MW.

Pit 5 Bypass Reach

The Pit 5 bypassed reach receives most of its water from releases from the Pit 5 dam. Although the minimum inflow is 100 cfs, this minimum is adjusted when necessary to maintain at least 120 cfs as measured at Big Bend, downstream of Nelson Creek. The Pit 5 bypassed reach is characterized by large amplitude meanders upstream of Big Bend with longer meanders and relatively straight sections downstream. Two main tributaries enter the Pit 5 bypassed reach: Nelson Creek about 3.7 miles downstream of Pit 5 dam and Kosk Creek about 1.8 miles downstream of the confluence of Nelson Creek.

Other Projects in the Immediate Area
In addition to the Pit 3, 4, 5 Project, PG&E owns and operates other projects within the Pit River and Hat Creek basins: Pit I Project (FERC No. 2687); Hat Creek Project (FERC No. 2661); and James B. Black, Pit 6, and Pit 7 developments (FERC No. 2106, McCloud-Pit Project). Pit 1 is located upstream of the Pit 3, 4, 5 Project and upstream of Hat Creek. Pit 6 and 7 are located downstream of Pit 5 and upstream of Shasta Lake. The James B. Black powerhouse, whose source is the Iron Canyon reservoir, is located along the Pit River, just upstream, but is not a factor in the operation, of the Pit 5 powerhouse.

B. IMPORTANT PROVISIONS AND REQUIREMENTS IN LICENSE

1. **Flows** [Reference: Appendix A of the license]

As part of the Water Quality Certification, California State Water Resources Control Board (SWRCB) required minimum stream flows as follows:

Pit 3 Reach			
Season	*Start Date*	*End Date*	*Required Minimum Streamflow*
Summer	April 21	August 31	300 cfs
Fall	September 1	Between Nov 1 and Nov 30	280 cfs
Winter (after spill occurs)	November 1 - April 20	April 20	350 cfs
Winter (prior to spill)	December 1	April 20	300 cfs
Winter Spill Cessation	March 16 - June 15	June 15	Following cessation of spill: 450 cfs for 14 days then 400 cfs for 10 days then 350 cfs for 10 days then 300 cfs

Pit 4 Reach			
Season	*Start Date*	*End Date*	*Required Minimum Stream Flow*
Summer	June 16	August 31	375 cfs
Fall	September 1	Between November 1 and November 30	350 cfs

Winter (after spill occurs)	Between November 1 and June 15	June 15	450 cfs
Winter (prior to spill)	December 1	June 15	375 cfs
Winter Spill Cessation	March 16 May 1 June 1	April 30 May 31 June 15	600 cfs 550 cfs 500 cfs
Pit 5 Reach			
Season	*Start Date*	*End Date*	*Required Minimum Stream Flow*
Summer	April 21	August 31	400 cfs
Fall	September 1	Between November 1 and November 30	350 cfs
Winter (after spill occurs)	Between November 1 and April 20	April 20	450 cfs
Winter (prior to spill)	December 1	April 20	400 cfs
Winter Spill Cessation	Between March 16 and June 15	June 15	Following cessation of spill: 550 cfs for 14 days then 500 cfs for 10 days then 450 cfs for 10 days then 400 cfs

2. **Threatened and Endangered Species** [Reference: Threatened and Endangered Species Pg 13 of the License]

The Department of Interior and Fish and Wildlife Service (FWS) identified four federally listed species that could occur in the project area: the threatened valley elderberry longhorn beetle, bald eagle, and northern spotted owl, and the endangered Shasta crayfish.

3. **Forest Service Conditions** [Reference: Appendix B, Pg 104 of the License]

Pursuant to Section 4(e) of the Federal Power Act, Forest Service filed 4(e) terms and conditions for adequate protection and utilization of the Shasta National Forest lands and resources. Of the 27 conditions, Conditions 1 through 14 were general conditions while conditions 15 through 27 were project specific conditions.

C. MAP

There are two convenient ways to become familiar with this project on the Hydropower Reform Coalition website, www.hydroreform.org.

- Go directly to the project page http://www.hydroreform.org/projects/pit-3-4-5-p-233
- To understand the geographical context of the project, visit the *On Your River* section of the site. This link (http://www.hydroreform.org/on-your-river/California) will take you to the section for rivers in California. Then zoom in toward northeasters region of the state until you can see Shasta Lake. The Pit 3-4-5 project is located northeast of the Lake along Hwy 299.