ASHTON HYDROELECTRIC PROJECT

FERC No. P-2381

EXHIBIT A

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Introduction

This Exhibit A is a description of the Ashton Hydroelectric Project. The project is, as of September 13, 2013, comprised of one development. Its description includes the location, general configuration, physical composition, and dimensions of the project structures. The description also includes information on the project reservoir; turbine-generator units; primary transmission lines; and appurtenant mechanical, electrical, and transmission equipment.

This Exhibit A is organized into five sections; introduction, an overview and history of the project, a description of project facilities, a description and tabulation of federally owned lands of the United States that are within the project boundary, and citations from the Code of Federal Regulations (CFR) applicable to this exhibit.

Overview and History of the Project

The Ashton Project is 2.5 miles west of the town of Ashton, in Fremont County, Idaho. The Ashton Project is on the Henry's Fork of the Snake River.

Construction

In 1918, the Ashton and St. Anthony Power Company completed the dam and powerhouse that comprise the Ashton Project. The powerhouse was built to house three generating units but was only outfitted with one in 1918. Six years later in 1924, Utah Power & Light Company acquired the project. The following year, Utah Power & Light set about installing two more generating units in the powerhouse and repairing sloughing on the upstream dam face that was apparent when the reservoir was lowered. In addition to the installation of the two units, the original unit and the station were modernized, the transformers were removed from the transformer room, a new 46 kV outdoor substation was constructed, and the dam was strengthened by changing the upstream slope from 2:1 to 2-1/2:1. In 1958, repairs were made to stabilize the powerhouse and a section of the dam west of the powerhouse to prevent erosion.

Following the merger of Utah Power and Light with Pacific Power, the project was transferred to PacifiCorp in 1988. A major project to accommodate the maximum probable flood was undertaken by PacifiCorp in 1991 that entailed removing the top five feet of the dam crest to allow the dam crest to function as an overflow spillway. As part of this project, the dam crest and downstream dam face were covered in roller-compacted concrete, additional ballast rock was added to the upstream dam face for seismic loading, wood spillway gate skins were replaced with steel, a bypass valve was installed in the No. 1 turbine pit, and the original 1917 turbine No. 1 was replaced and its generator was rewound.

Repeated discovery of sinkholes, evidence of piping, and embankment settlement issues on the Ashton Dam led to the start of a project in 2006 to remediate these defects. The new facilities constructed as part of this project are described in subsequent sections of this Exhibit A and include reconstruction of the rock- and earth-fill embankment structure, repair of powerhouse and crib wall buttress structures, repair of spillway gates, and construction of the right embankment bypass tunnel.

To guide the project an Ashton Board of Consultants was convened and maintained technical review of the mitigation design, construction, and surveillance monitoring along with Federal Energy Regulatory Commission (FERC) D2SI. FERC D2SI-PRO granted authorization to commence construction in an August 2, 2010 letter, and Phase 1 of the construction began that month. The first monthly construction report was filed September 15, 2010, and monthly construction reports continued until the construction and post-construction dam safety and surveillance and monitoring activities were completed on January 23, 2013. The final construction report with certifications of completion was filed on April 23, 2013.

Developments

The Ashton Hydroelectric Project was originally licensed to Utah Power and Light Company on December 19, 1977[1] as the Ashton-St. Anthony Hydroelectric Project. This original license had an effective date of 1938. Although licensed together, the St. Anthony and the Ashton Projects shared no facilities, lands or any portion of project boundaries. The Ashton-St. Anthony Hydroelectric Project received a new 40-year license under the same name on August 3, 1987[2]. Following the merger of Pacific Power and Utah Power & Light, the project was transferred to PacifiCorp on November 23, 1988[3].

On June 11, 2013, in a Notice of Application for Partial Transfer and Amendment of License and Request for Expedited Action, and Soliciting Comments and Motions to Intervene, PacifiCorp and St. Anthony Hydro, LLC jointly proposed mutual terms of sale and transfer of the entirety of St. Anthony Development from PacifiCorp to St. Anthony Hydro, LLC. FERC accepted the proposal and sale in a September 13, 2013 Order[4], removed the St. Anthony Development from the project, and renamed it the Ashton Hydroelectric Project. The Ashton Hydroelectric Project retained the original P-2381 designation.

Description of the Ashton Hydroelectric Project

When licensed in 1987 and as stated in the September 13, 2013 Order, the Ashton Project is comprised of the following:

[1] *Utah Power & Light Co.* 1 FERC ¶ 61,263 (1977). The license was made effective January 1, 1938, with an expiration date of December 31, 1987.

[2] *Utah Power & Light Co.* 40 FERC ¶ 61,139 (1987). The new license was issued effective January 1, 1988, with an expiration date of December 31, 2027.

[3] *Utah Power & Light Co. and PC/UP&L Merging Corp.*, 45 FERC ¶ 62,145 (1988). The license transfer was a result of a merger of PacifiCorp and Utah Power & Light Corp. into PacifiCorp.

[4] Order Amending License, Designating New Docket Number, Approving Transfer of License, and Revising Annual Charges; Ashton Hydroelectric Project FERC No. P-2381, and St. Anthony Hydroelectric Project FERC No. P-14552: 144 FERC ¶ 62,239: September 13, 2013.

Project Works

a) a 56-foot-high, 222-foot-long, earth- and rock-filled dam having its downstream slope covered with roller-compacted concrete and a crest elevation at 5,156.6 feet[5];
b) an 82-foot-long reinforced concrete spillway surmounted by six 10-foot-high radial gates;
c) a reservoir having a normal maximum water surface area of 392.9 acres[6], an approximate volume of 6,080 acre-feet[7] at a maximum full pool surface elevation of 5,155.9 feet ;
d) a reinforced-concrete powerhouse located at the right bank, having integral intakes controlled by vertical slide gates and containing three generating units, two rated at 2,000 kW, and one rated at 2,700 kW;
e) a tailrace;
f) a 46/2.3-kV step-up transformer;
g) a 133-foot-long, 46-kV transmission line; and
h) appurtenant facilities.

Powerhouse

The powerhouse is a reinforced concrete structure 71 feet wide in the cross-canyon direction extending 65 feet 8 inches in the upstream-downstream direction, including the buttress slab. It is founded on a reinforced concrete slab with an average thickness of two feet and a base elevation of 5,094.0 feet. A 2.5-foot thick concrete armoring layer was placed on the downstream side of the powerhouse from elevation 5,114 to 5,150 feet in 2012. There is also a small office/equipment structure 16 feet by 27 feet attached to the west end of the building (formerly the bus room). Located within the powerhouse is an electrically operated 20-ton traveling crane.

Generators and Turbines

The powerhouse contains three vertical Francis turbine-generator units (see Table 1) having a combined capacity of 6.7 megawatts. Integral to the powerhouse are three intakes and tailraces for all three generating units. Unit 1 has a vertical shaft and no spiral case (open flume) with three intake gates 5 feet 4 inches wide by 8 feet high. Units 2 and 3 have intake spiral cases and three intake gates 5 feet 4 inches wide by 11 feet 5 inches high.

[5] All elevations in this Exhibit are PacifiCorp local datum. To change to NAVD 88 add 2.972 feet.

[6] Electrical Consultants Inc., 2015 Ashton Hydro Property Resolution Project.

[7] Ashton Dam Hydroelectric Project Bathymetry and Sediment Study. Cirrus Ecological Solutions & Ecosystems Research Institute, July 16, 2010. From this report a reservoir volume of 6,119.4 acre feet was provided at an elevation of 5,156.0 feet. PacifiCorp adjusted this reservoir volume for a maximum full pool elevation of 5,155.9 feet elevation resulting in a volume of 6,080.1 acre feet.

Table 1. Description of Generators and Turbines at the Ashton Hydroelectric Project when Licensed in 1987 and As Stated in the September 13, 2013 Order.			
Equipment	**Unit 1**	**Unit 2**	**Unit 3**
Generator			
Date Installed	1992	1925	1925
Generator Mfg.	G.E.	G.E.	G.E.
Capacity (kW)	2,700	2,000	2,000
kVA	3,000	2,500	2,500
Voltage	2,400	2,400	2,400
Power Factor	0.9	0.8	0.8
Exciter	Solid State	Solid State	Solid State
Governor	Woodward	Woodward	Woodward
Turbine			
Turbine	Vertical Reaction	Vertical Reaction	Vertical Reaction
Manufacturer	American Hydro	S. Morgan Smith	S. Morgan Smith
Rated H. P.	4,000	3,000	3,000
Gross Head	48'	48'	48'
CFS Capacity	875	850	850
Water Passage	Open Wheel Pit	Concrete Scroll Case	Concrete Scroll Case
RPM	225	180	180

A 42-inch bypass valve was installed in the No. 1 turbine pit as part of the 1991-1992 upgrade work on the No. 1 unit. The valve centerline is at elevation 5,123.0 feet, and the hydraulic operator (with manual backup) for the valve is located on the generator floor. The valve is used to pass a minimum of 300 cfs downstream, should the plant trip off for any reason.

Appurtenant Electrical Equipment for Plant Operation

The items listed in Table 2 are installed at the Ashton Hydroelectric Project as appurtenant electrical equipment to the operation of the plant. Not included are electrical items considered to be part of the overall PacifiCorp "system" – items which are independent of the Ashton plant in use:

Table 2. Appurtenant Electrical Equipment Installed at the Ashton Hydroelectric Project.			
Appurtenant Equipment	**Quantity**	**Type**	**Details**
Generator Breakers	3	Vacuum circuit	5 kV, 1200 ampere
Generator Step-Up Transformer	1	Three phase	9,375 kVA, 46-2.3 kV
Station Service Transformer	1	Dry Three phase	75 kVA, 2,400-120/240 v.
Station Service Back-up Transformer	1	Three-single phase	15 kVA, 2,400-120/240 v.
Battery Bank	1	DC	48 v.
Battery Bank	1	DC	125 v.
Emergency Generator	1	Three phase	75 kW

Embankment Dam

Ashton Dam is a zoned earth- and rock-fill embankment dam that has a maximum height of 56 feet, a length of 222 feet, and a crest at elevation 5,156.6 feet. The crest of the dam consists of a reinforced concrete crest slab 50 feet wide by 3.5 feet thick and a 10-foot-deep concrete cutoff wall on the upstream edge. The downstream face of the earth- and rock-fill embankment is protected with roller-compacted concrete (RCC) to accommodate passage of the probable maximum flood (overflow spillway). The upstream rock fill has an upstream slope of 4 horizontal to 1 vertical. The earth- and rock-fill embankment was reconstructed in 2012 consisting of (upstream to downstream) a rock-fill buttress, a granular transition/bedding zone, a compacted silt core, and a three-stage filter zone placed against the original rock-fill embankment. The upstream side of the original rock-fill embankment is inclined at a slope of 1 horizontal to 1 vertical. A foundation transition zone was placed beneath the silt core footprint.

The foundation contact beneath the embankment generally occurs between elevation 5,104 and 5,100 feet and consists of dense to very dense alluvial deposits of sands, gravels and cobbles ranging between 3 to 6 inches in diameter and the interstitial spaces tightly filled by the well-graded dense to very dense sands and gravels. A 2.5-foot-thick concrete core wall with a top at elevation 5,110.0 feet is located approximately 100 feet upstream from the centerline of the concrete crest slab and extends the full valley width.

The left abutment contact for the embankment dam consists of basalt rock that was treated during the 2012 modifications. The right abutment contact for the embankment dam consists of a 50-foot- high reinforced concrete retaining headrace wall founded on top of the abandoned low-level conduits extending upstream from the powerhouse 50 feet.

Abandoned Low Level Outlet Conduit

The original project included a low level outlet consisting of two 7-foot-wide by 10-foot-high, 215-foot-long reinforced concrete conduits extending under the embankment, and a control shaft

extending to the crest of the dam, adjacent to the powerhouse. The conduits were abandoned by grouting in 1991. The upper portion of the control shaft was removed to elevation 5,129.0 feet during the dam remediation project in 2012.

Diversion Tunnel

The diversion tunnel is 280 feet long and 15 feet high, located through the right abutment. The tunnel walls and arched roof are shotcrete lined and supported by steel sets, rock bolts, cable bolts, and spiling. The floor is reinforced concrete. The intake consists of a reinforced concrete control structure, two 7.5-foot-wide by 15-foot-tall stainless steel slide gates with an invert at elevation 5,110.0 feet with electrically powered hoists, steel trash racks and a single removable bulkhead gate. The maximum invert to the approach channel to the intake control structure is at elevation 5,114.0 feet. The exit portal is located approximately 100 feet downstream of the powerhouse and has an invert at elevation 5,107.8 feet.

Gated Spillway

The 82-foot-wide gated spillway is located on the left abutment and separated from the dam-crest-overflow spillway by a reinforced concrete training wall. The reinforced concrete spillway gate piers are 2 feet wide and are anchored to the bedrock at the heel with eight ¾-inch bars embedded 2 feet into rock. The six 10-foot-high by 12-foot-wide radial spillway gates are set on a sill at elevation 5,146.6 feet and their top is at elevation 5,155.9 feet. The approach channel and spillway chute are excavated into bedrock. The spillway gates are operated using the single movable, electric hoist or the single hand-operated, overhead chain hoist.

Overflow Spillway

The RCC overflow spillway located on the downstream side of the earth- and rock-fill embankment is 222 feet wide and 12 to 20 feet thick and has an effective slope of 1 vertical to 1.5 horizontal with 2-foot-high by 3-foot-wide steps. The overflow transition section consists of a short ogee section from the concrete crest slab to the RCC. An RCC apron extends approximately 40 feet downstream from the toe of the embankment toe with a top at elevation 5,100 feet. There are three levels of horizontal drains located at elevations 5,101, 5,110, and 5,120 feet. The RCC overflow spillway extends the full width of the downstream slope by the reinforced concrete slab varying in width from 14 to 19 feet, adjacent to the powerhouse.

Right Abutment Crib Wall

The right abutment crib wall structure is composed of three concrete walls in series anchored to the right abutment rock and founded on the alluvial foundation material. The upstream wall extends from the right abutment to the headrace wall upstream of the powerhouse at an elevation of 5,130 feet and extends into the foundation to an unknown depth. The central and downstream walls are approximately 66 feet long by 56 feet high and extend from the right abutment to the powerhouse with the top of the central wall at elevation 5,169.6 feet. The crib wall structure retains grouted rock fill.

A reinforced concrete stability block at the toe, and 3.5-foot thick concrete armoring layer from elevation 5,114 to 5,150 feet were added to the downstream wall in 2012.

Reservoir
The normal maximum water surface area of Ashton Reservoir is 392.9 acres at a maximum full pool elevation of 5,155.9 feet. The gross storage capacity of the reservoir is 6,080 acre-feet.

Access Road
Access to the facility is by two-lane county road on both sides of the river.

Miscellaneous Structures
Other structures included in this project are four cottages, one garage, two shop buildings, two sheds, two boat launch ramps and one dock at the recreation site, and two railroad flat-car bridges. There is a small structure on the west end of the crib wall that houses the emergency power unit transformer.

Transmission Lines
The transmission line from the powerhouse to the substation is a 133-foot-long, 46,000 volt overhead line.

Recreation
The Ashton Reservoir and tailrace waters provide desirable fishing opportunities. The reservoir is stocked annually in compliance with the License-mandated fish stocking plan. The reservoir fishery is utilized for bank fishing at the upstream end and near residences, for boat fishing and for winter ice fishing. Upstream access to the reservoir is provided at the Ashton Boat Launch (Jim's Dock). This recreation site has two launch ramps: one for drift boaters to take out when they reach the reservoir headwater and the second for reservoir power boat access. The recreation site has accessible parking and toilet facilities. Directly downstream of the dam, angler access to the river is provided along a project access road. This road allows anglers to access an island directly below the dam and the river reach downstream to Ora Bridge.

Federally Owned Lands
The Ashton Hydroelectric Project Boundary includes 15.6 acres that are administered by the US Bureau of Land Management (Table 3). The federal lands within the Project boundary are not occupied by Project transmission lines.

Table 3. Description of Federal Lands within the Ashton Hydroelectric Project Boundary				
PLSS Township and Range, Boise Meridian	PLSS Section	Subdivision Description	Acres	Agency Jurisdiction
T9N, R42E	15	Portions of the NW 1/4 of the NW 1/4	0.3	BLM
T9N, R42E	15	Portions of the SW 1/4 of the NW 1/4	2.7	BLM
T9N, R42E	15	Portions of the SE 1/4 of the NW 1/4	2.0	BLM
T9N, R42E	15	Portions of the NW 1/4 of the SE 1/4	3.7	BLM
T9N, R42E	21	Portions of the NE 1/4 of the NE 1/4	1.1	BLM
T9N, R42E	21	Portions of the SW 1/4 of the NE 1/4	4.7	BLM
T9N, R42E	22	Portions of the SW 1/4 of the SW 1/4 (Lot 8)	1.2	BLM

Code of Federal Regulation Citation

18 CFR, Subchapter B, Subpart E, 4.41(b) Exhibit A is a description of the project. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The description for each development must contain:

(1) The physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces or other structures proposed to be included as part of the project;

(2) The normal maximum water surface area and normal maximum water surface elevation (mean sea level); gross storage capacity of any impoundments to be included as part of the project;

(3) The number, type, and rated capacity of any proposed turbines or generators to be included as part of the project;

(4) The number, length, voltage and interconnections of any primary transmission lines proposed to be included as part of the project [See 16 U.S.C. 796(11)];

(5) The description of any additional mechanical, electrical, and transmission equipment appurtenant to the project; and

(6) All lands of the United States, including lands patented subject to the provisions of section 24 of the Act, 16 U.S.C. 818, that are enclosed within the project boundary described under paragraph (h) of this section (Exhibit G), identified and tabulated by legal subdivisions of a public land survey by the best available legal description. The tabulation must show the total acreage of the lands of the United States within the project boundary.