Application for Low Impact Hydropower Institute Recertification

Prospect No. 3 Hydroelectric Project
(FERC No. P-2337; LIHI Certificate No. 109)
Jackson County, Oregon

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PACIFICORP

February 2020

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ACRONYMS AND ABBREVIATIONS

7DMAX—7-day, rolling average of 24-hour, maximum water temperatures
ACOE—Army Corps of Engineers
APE—area of potential effect
BLM—Bureau of Land Management
BMP—best management practice
CEII—critical energy infrastructure information
CFR—Code of Federal Regulations
cfs—cubic feet per second
CH—critical habitat
CLNP—Crater Lake National Park
Commission—Federal Energy Regulatory Commission
COPCO—California Oregon Power Company
CWA—Clean Water Act
DO—dissolved oxygen
DEQ—Department of Environmental Quality
EA—environmental assessment
EQC—Environmental Quality Commission
EPA—Environmental Protection Agency
ESCP—Erosion and Sediment Control Plan
FERC—Federal Energy Regulatory Commission
FPA—Federal Power Act
FPC—Federal Power Commission
fps—feet per second
FS—Forest Service
ft.—feet
FWS—Fish and Wildlife Service
hp—horse-power
HCC—Hydro Control Center in Ariel, Washington
HPMP—Historic Properties Management Plan
HSC—habitat suitability curve
HUC—Hydrologic Unit Code
IFIM—instream flow incremental method
IMCI—Imnaha Creek Inflow (i.e., above diversion) water quality monitoring site
in.—inches
kVA—kilovolt amps
kW—kilowatts
kWh—kilowatt hours
L—liters
LIHI—Low Impact Hydropower Institute
LUCS—land use compatibility statement
LWM—large woody material
m.—meters
m^3—cubic meters
mg—milligrams
mi.—miles

MW—megawatts
MWh—megawatt hours
NEPA—National Environmental Policy Act
NFP—Northwest Forest Plan
NOAA—National Oceanic and Atmospheric Administration
NPDES—National Pollutant Discharge Elimination System
NPS—National Park Service
NRCS—Natural Resources Conservation Service
NTU—nephelometric turbidity unit
OAR—Oregon Administrative Rules
ODEQ—Oregon Department of Environmental Quality
ODFW—Oregon Department of Fish and Wildlife
OPRD—Oregon Parks and Recreation Department
ORS—Oregon Revised Statues
ORV—outstanding remarkable values
OWRD—Oregon Water Resources Department
pH—power of hydrogen ions
PLC—programmable logic controller
PM&E—protection, mitigation, and enhancement
PRV—pressure relief valve
RM—river mile
rpm—revolutions per minute
RR-SNF—Rogue River-Siskiyou National Forest
SCADA—Supervisory Control and Data Acquisition
SCORP—Statewide Comprehensive Outdoor Recreation Plan
SFBL—South Fork Bypass Lower water quality monitoring site
SFBM—South Fork Bypass Middle water quality monitoring site
SFBU—South Fork Bypass Upper water quality monitoring site
SFRI—South Fork Rogue Inflow (i.e., above diversion) water quality monitoring site
SHPO—State Historic Preservation Office
SPCC—spill prevention, control, and counter-measure
SRG—Siskiyou Research Group
TIV—turbine isolation valve
TMDL—Total Maximum Daily Load
UGB—urban growth boundary
USDA—United States Department of Agriculture
USDI—United States Department of Interior
USDOD—United States Department of Defense
USGS—United States Geological Survey
VQO—visual quality objective
WQC—water quality certification
WSE—water surface elevation
WUA—weighted useable area

1.0 PROJECT DESCRIPTION

On September 27, 2019, FERC issued a new 40-year license to PacifiCorp to continue operating the Prospect No. 3 Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC or Commission) Project No. P-2337, on the South Fork Rogue River in Jackson County, Oregon. The Project has a generation capacity of 7.2 megawatts (MW) and is located on private lands primarily owned by PacifiCorp and federal lands managed by the Rogue River-Siskiyou National Forest (RR-SNF).

The Project is certified by the Low Impact Hydropower Institute (LIHI) with Certificate Number 109. The current LIHI certification, issued on December 31, 2014, expired on December 31, 2019. This recertification application includes information on the Project facilities, history, setting, operations, compliance during the certification term, and zones of effect, as well as new license requirements and their impact on achievement of the LIHI criteria.

1.1 PROJECT FACILITIES

A summary of Project facilities is provided below in Table 1 in the format of LIHI's Table B-1.1. Additional narrative descriptions of the facilities are provided in the following sub-sections. Project Facilities are depicted spatially in Figure 1. Photos of the Project facilities are provided in Appendix B.

Table 1. Project facilities (LIHI Table B-1.1.)

Item	***Information Requested***	***Response (include references to further details)***
Name of the Facility	Facility name (use FERC project name or other legal name)	Prospect No. 3 Hydroelectric Project
Location	River name (USGS proper name)	South Fork Rogue River
	Watershed name (Select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: https://water.usgs.gov/wsc/map_index.html)	17100307 - Upper Rogue
	Nearest town(s), county(ies), and state(s) to dam	Prospect, Jackson County, Oregon
	River mile of dam	10.5
	Geographic latitude of dam	42.706220

Item	*Information Requested*	*Response (include references to further details)*
	Geographic longitude of dam	-122.388541
Facility Owner	Application contact names (Complete the Contact Form in Table 14 also):	Mark Sturtevant, Renewable Resources Vice President Todd Olson, Director of Compliance Steve Albertelli, License Program Manager
	Facility owner company and authorized owner representative name. **For recertifications: If ownership has changed since last certification, provide the date of the change.**	PacifiCorp Mark Sturtevant, Renewable Resources Vice President
	FERC licensee company name (if different from owner)	PacifiCorp
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates, or date of exemption	P-2337, Issued September 27, 2019, Expires August 31, 2059
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", “non-jurisdictional”)	Major
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	Prospect No. 3 Hydroelectric Project Certification; Issued February 6, 2020; Issued by Oregon Department of Environmental Quality Available on-line at: https://www.oregon.gov/deq/wq/wqpermits/Pages/Section-401-Hydropower.aspx

Item	*Information Requested*	*Response (include references to further details)*
	Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories[1]	License: https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15363858 Environmental Assessment: https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14889420 Revised Proposed Project: https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14819714 Final License Application: https://elibrary.ferc.gov/idmws/File_list.asp?document_id=14526879 Pre-Application Document https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13295286
Powerhouse	Date of initial operation (past or future for pre-operational applications)	April 22, 1932
	Total installed capacity (MW) **For recertifications: Indicate if installed capacity has changed since last certification**	7.2 MW; No change since last certification
	Average annual generation (MWh) and period of record used **For recertifications: Indicate if average annual generation has changed since last certification**	35,050 MWh (1986-2015; 30-year average) 30-year rolling average includes additional information since last certification. In general, average annual generation will decline with increased minimum flows required by the new license.
	Mode of operation (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) **For recertifications: Indicate if mode of operation has changed since last certification**	Run-of-river; No change since last certification

1 For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service, 3rd-party agreements about water or land management, grants of right-of-way, U.S. Army Corps of Engineers permits, and other regulatory documents. If extensive, the list of hyperlinks can be provided separately in the application.

Item	*Information Requested*	*Response (include references to further details)*
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	One 47-inch diameter, 10,700-hp, vertical-shaft, Francis-type turbine with single runner reaction and spiral case manufactured by American Hydro Corporation and operating under 693 feet of net head. During standard operation (automated mode), the minimum hydraulic capacity is approximately 200 kW/3 cfs. The maximum hydraulic capacity is 7,200 kW/150 cfs.
	Trashrack clear spacing (inches), for each trashrack	Intake rack: 3 inches on-center Penstock rack: 3 inches on-center
	Dates and types of major equipment upgrades	Turbine runner (1997)
	Dates, purpose, and type of any recent operational changes	On September 27, 2019, in response to issuance of a new FERC license, minimum flows were increased from the previous minimum of 10 cfs to the new, seasonal minimum of 30 cfs. Diversions were reduced accordingly.
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	No powerhouse upgrades or license amendments planned.
Dam or Diversion	Date of original construction and description and dates of subsequent dam or diversion structure modifications	Originally constructed between 1931 and 1932.
	Dam or diversion structure height including separately, the height of any flashboards, inflatable dams, etc.	24.7'-high, including 8" x 16" beveled timber weir boards
	Spillway elevation and hydraulic capacity	3,375.7' above msl, ungated, ogee-style spillway
	Tailwater elevation (provide normal range if available)	2,633' above msl

Item	*Information Requested*	*Response (include references to further details)*
	Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse	The 15,894-foot-long Project waterway consists of, in order, (a) a 273'-long concrete-lined canal section; (b) a 66"-diameter, 5,448'-long woodstave pipe; (c) a 5,805'-long concrete-lined canal section; (d) a 5'-wide by 6.5'-high, 698'-long, concrete-lined, horseshoe type tunnel; (e) a 416'-long canal to penstock transition (i.e. forebay) with a 2,486'-long side channel spillway that discharges to Daniel Creek; and (f) a 66" to 48"-diameter , 3,254'-long, riveted steel penstock.
	Dates and types of major infrastructure changes	Fish screen, control building, and associated infrastructure (1996)
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Diversion of water for electrical power generation
	Source water	South Fork Rogue River
	Receiving water and location of discharge	Project water from the tailrace is conveyed to the Middle Fork Canal of the Prospect Nos. 1, 2, and 4 Hydroelectric Project and is ultimately discharged into the North Fork Rogue at North Fork Reservoir.
Conduit	Date of conduit construction and primary purpose of conduit	Constructed in 1931 for the purpose of power generation
Impoundment and Watershed	Authorized maximum and minimum water surface elevations **For recertifications: Indicate if these values have changed since last certification**	Run-of-river project with no appreciable storage. Impoundment elevation of 3,375.7' above msl. No change since last certification.
	Normal operating elevations and normal fluctuation range **For recertifications: Indicate if these values have changed since last certification**	Run-of-river project with no appreciable storage. Average and maximum depths are approximately five feet and eight feet, respectively. No change since last certification.

Item	*Information Requested*	*Response (include references to further details)*
	Gross storage volume and surface area at full pool **For recertifications: Indicate if these values have changed since last certification**	The impoundment has a gross storage capacity of approximately 19 acre-feet. At normal maximum pool, the impoundment has a surface area of approximately one acre. No change since last certification.
	Usable storage volume and surface area **For recertifications: Indicate if these values have changed since last certification**	Useable capacity of less than 5 acre-feet and surface area of approximately one acre. No change since last certification.
	Describe requirements related to impoundment inflow, outflow, up/down ramping and refill rate restrictions.	Project must be operated in a run-of-river mode such that, at any point in time, the sum of project outflows approximates the sum of inflows to the project. Minimum flows in the bypassed reach are equal to or greater than 30 cubic feet per second from March 1 through July 31 and equal to or greater than 20 cubic feet per second from August 1 through February 28. Ramping rates in the bypassed reach shall not exceed 0.2 foot per hour.
	Upstream dams by name, ownership, and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage.	None
	Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage	William L. Jess Dam, owned and operated by U.S. Army Corps of Engineers, on Rogue River mile 157 does not have upstream fish passage.
	Operating agreements with upstream or downstream facilities that affect water availability and facility operation	None
	Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control.	367.2 acres of Project lands, of which 52.5 acres are federal land administered by US Forest Service. Project waters include approximately 1-acre impoundment.

Item	*Information Requested*	*Response (include references to further details)*
Hydrologic Setting	Average annual flow at the dam, and period of record used	170 cfs (WY 1934 to 1949; discontinued upstream gages)
	Average monthly flows and period of record used	Jan 166 cfs, Feb155 cfs, Mar 176 cfs, Apr 275 cfs, May 357 cfs, Jun 270 cfs, Jul 132 cfs, Aug 92 cfs, Sep 79 cfs, Oct 74 cfs, Nov 109 cfs, Dec 150 cfs (WY 1934 to 1949; discontinued upstream gages)
	Location and name of closest stream gauging stations above and below the facility	Above: None Below: USGS 14332000 South Fork Rogue River Near Prospect, OR at river mile 10.25
	Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration.	83.1 square miles
Designated Zones of Effect	Number of zones of effect	3
	Upstream and downstream locations by river miles	ZOE 1 (Project Facilities): South Fork Rogue RM 10.5 to Project sag-pipe ZOE 2 (Project Bypassed Reach): South Fork Rogue RM 0.0 to RM 10.5 ZOE 3 (Project Water Discharge): Rogue RM 172
	Type of waterbody (river, impoundment, bypassed reach, etc.)	ZOE 1: Impoundment and Project waterway ZOE 2: Bypassed reach ZOE 3: Non-Project Reservoir
	Delimiting structures or features	ZOE 1: Impoundment to sag-pipe ZOE 2: South Fork Diversion Dam to South Fork Rogue confluence with North Fork Rogue ZOE 3: 200’ radius from discharge of Middle Fork Canal into North Fork Reservoir
	Designated uses by state water quality agency	Beneficial uses designated for “Rogue River Main Stem above Lost Dam & Tributaries”: Public Domestic Water Supply; Private Domestic Water Supply; Industrial Water Supply; Irrigation; Livestock Watering; Fish and Aquatic Life; Wildlife and Hunting; Fishing; Boating; Water Contact Recreation; Aesthetic Quality; and Hydro Power

1.1.1 South Fork Diversion Dam

The South Fork Diversion Dam is a 172-foot-long, 24.7-foot-high concrete dam with a 98-foot-long, un-gated ogee spillway at River Mile 10.5 of the South Fork Rogue River. The 18-foot-wide waterway intake structure is located on the north end of the dam on the right bank of the river. The intake structure has a trash rack with bars spaced three inches on-center, which are cleaned via an automated Atlas Polar trash rake. There is a control and communications building above the intake structure. Continuous data provided by a water surface elevation level logger over the upstream impoundment determines the aperture of the waterway intake sluice gates.

1.1.2 South Fork Impoundment

The South Fork Diversion Dam impounds the South Fork Rogue River at the elevation of the un-gated spillway crest at 3,375.7 feet above sea level. At normal maximum pool, the impoundment has a surface area of approximately one acre. The retention time of impounded water is less than one hour. The impoundment has a gross storage capacity of approximately nineteen acre-feet and useable capacity of less than five acre-feet. Average and maximum depths are approximately five feet and eight feet, respectively.

1.1.3 Fish Passage Facilities

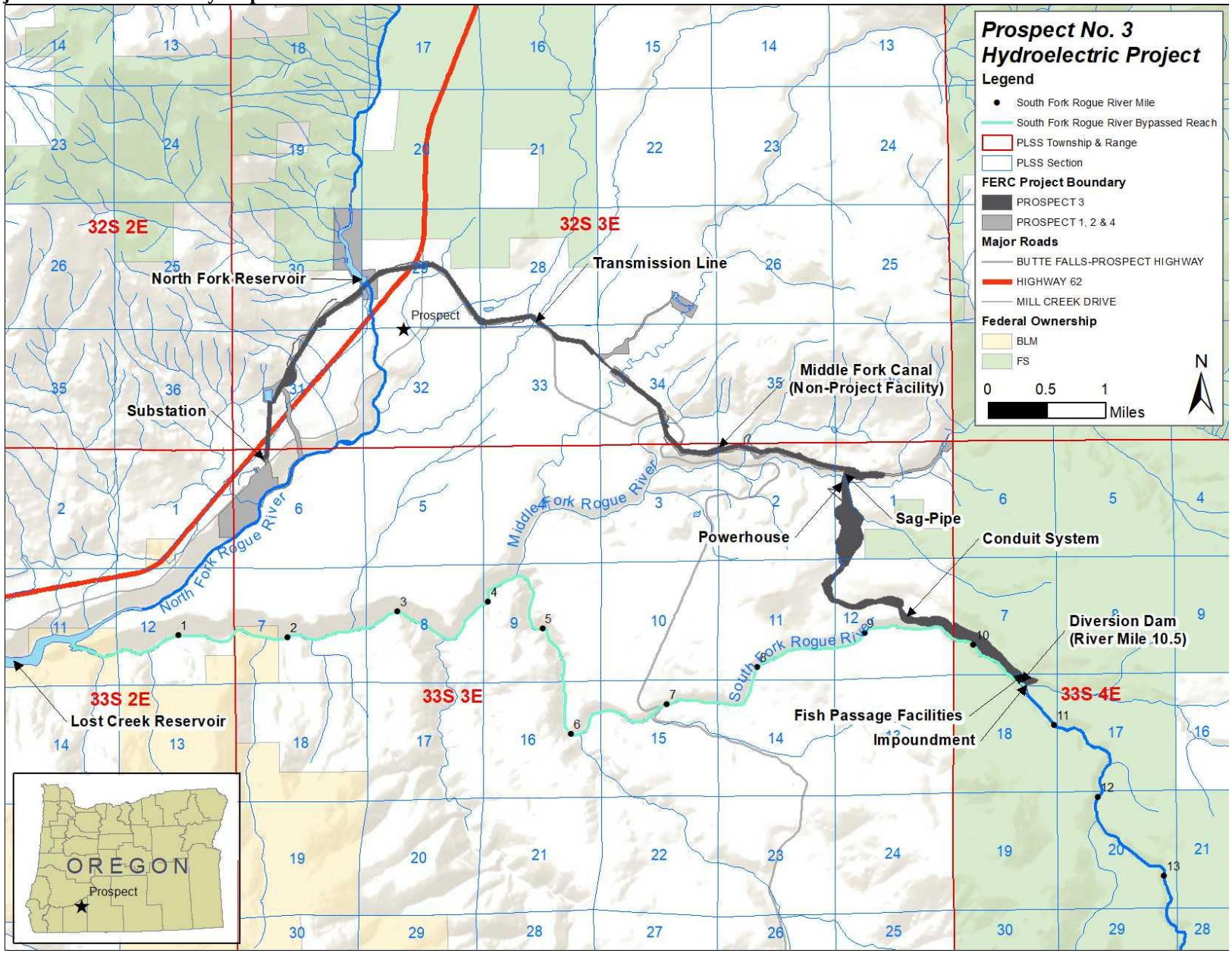
1.1.3.1 Fish Ladder

The fish ladder is a concrete pool-and-weir-type ladder with 15 pools of varying dimensions and an approximate running length of 86 feet, providing upstream fish passage over the diversion dam. The ladder is located on the north bank of the South Fork Rogue River adjacent to the waterway intake structure. Pools 1 through 6 of the ladder ascend from the river in a westerly direction to the switchback between Pools 6 and 7, after which the ladder ascends in an easterly direction toward the dam. The fish ladder exit is provided by two submerged, sluice-gated 2.5’ x 1.3’ rectangular orifices at the upstream face of the dam to the south of the intake structure. The ladder was originally constructed in 1931 and was modified in 1973 and again in 1996 to its current form.

1.1.3.2 Fish Screen

The fish screen is located within the Project waterway approximately 215’ downstream of the dam. The inclined-plane screen is 25’ in length, 9’ 9” in width, and composed of 0.25” wedge-wire, with a surface area of approximately 193 square feet. Perforated plate baffles were temporarily installed to create a more uniform flow through the screen following hydraulic assessments in 1998. The baffles were redesigned and replaced in 2015. The screen rotates at its mid-point along the horizontal axis from the inclined position to a plane or declined position to facilitate debris removal via backwashing the screen face with canal flows (see FLA E.6.3.2 for additional information on fish screen cleaning cycles). Converging channel walls over the downstream 11’ 5” of the screen direct fish to the fish return pipe.

Figure 1. Project facilities and vicinity map



A backwater sluice gate downstream of the fish screen automatically adjusts its aperture to regulate water surface elevations over the fish screen and into the fish return pipe at varying diversion flow rates. Continuous data provided by water surface elevation level loggers on the upstream and downstream sides of the screen are used to initiate rotation of the screen for cleaning cycles.

1.1.3.3 Fish Bypass Return Pipe

The fish bypass begins at the converging walls of the fish screen with an 18”-wide, 28”-high steel flume with a 5’ radius, 180 degree turn. The bypass is designed to accommodate bypass flows of 6 to 15 cubic feet per second (cfs). An approximately 60”-long, 30”-high slide conveys fish from the steel flume to the 18”, steel bypass return pipe. The bypass return pipe descends approximately 48” in elevation in a southeasterly direction for approximately 159.5’ to the pipe outlet above Pool 6 of the fish ladder. Fish bypass pipe flows increase attraction flows to the fish ladder.

1.1.4 Proposed Auxiliary Minimum Flow Release System

PacifiCorp proposes to construct an auxiliary flow release system in the canal approximately 150’ downstream of the intake headgate to provide minimum flows to the bypassed reach. As of the date of this document, the auxiliary flow release system is in the conceptual design phase. The auxiliary flow system will include a 3 foot-wide, adjustable, automated, downward-opening slide gate installed on the downstream end of the existing canal overflow. The auxiliary flow gate will work in tandem with the backwater gate downstream of the fish screen to maintain sufficient water surface elevation (WSE) in the canal to provide flows to both the fish return bypass at the fish screen and auxiliary flow system. The proposed auxiliary flow gate opening will spill into an 8 foot-long and 5 foot-wide plunge pool before entering a 2 foot-diameter pipe. The 2 foot-diameter pipe from the plunge pool will be 130 feet long with a slope of 0.058. A long-radius, 90° bend will be used to turn the new auxiliary flow pipe toward the discharge adjacent to the existing fishway entrance. The auxiliary flow discharge is expected to be 3 feet above the existing low tail water level and result in a maximum impact velocity of less than 25 feet per second.

Article 402 of the new license requires PacifiCorp to file with the Commission within six months of license issuance (i.e., on or before March 27, 2020) a construction schedule for the auxiliary minimum flow release system.

1.1.5 Conduit System

Existing

The 15,894-foot-long Project waterway, with a primarily southeast-to-northwest alignment, consists of, in order, (a) a 273-foot-long concrete-lined canal section, which contains the fish screen; (b) a 66-inch-diameter, 5,448-foot-long woodstave pipe; (c) a 5,805-foot-long concrete-lined canal section; (d) a 5-foot-wide by 6.5-foot-high, 698-foot-long, concrete-lined, horseshoe type tunnel; (e) a 416-foot-long canal to penstock transition (i.e. forebay) with a 2,486-foot-long

side channel spillway that discharges to Daniel Creek; and (f) a 66-inch to 48-inch-diameter[2], 3,254-foot-long, riveted steel penstock with a south-to-north alignment.

Other components appurtenant to the waterway include, in order, a 77-foot-long side channel spillway upstream of the fish screen and adjacent to the fish ladder; a trash rack at the transition structure to the woodstave pipe; a trash rack at the transition to the tunnel; a trash rack at the penstock transition structure with bars spaced three inches on-center, which are cleaned via an automated Atlas Polar trash rake; and a valve house at the top of the penstock that houses the excess velocity valve.

Proposed

PacifiCorp proposes to replace the existing woodstave flowline with a 63-inch-diameter, 5/16-inch-thick, steel flowline in the same alignment as the existing flowline. The steel flowline would be supported by concrete piers spaced at intervals of 40-feet on-center. Construction is proposed for calendar year 2021.

1.1.6 Powerhouse

The powerhouse contains one generating unit with a rated capacity of 7,200 kW operating under a static head of 713.37 feet[3] and producing a 30-year (1986-2015) average annual energy output of 35,050 megawatt hours (MWh). A pressure relief valve (PRV) is automated to respond to forebay water surface elevations and allow penstock flows to bypass the turbine in the event of a generating unit trip or planned outage. The turbine isolation valve (TIV) closes automatically upon a unit trip, and subsequent increases in forebay water surface elevation resulting from the TIV closure will initiate a corresponding response in aperture of the PRV, allowing diverted flows to continue to the tailrace.

1.1.7 Tailrace

The concrete tailrace structure is approximately 20 feet by 20 feet by 5 feet with a 172-foot-long, concrete lined overflow spillway that discharges in an easterly direction to Daniel Creek. The tailrace backwater sluice gate is automated to respond to penstock flows and prevent routine discharge of flows to Daniel Creek.

1.1.8 Inverted Siphon (Sag-Pipe)

Existing

A 66-inch, 887-foot-long, inverted siphon routes flow from the Project tailrace to the Middle Fork Canal of the Prospect Nos. 1, 2, and 4 Hydroelectric Project (FERC Project No. P-2630). The existing siphon is primarily wood-stave construction with the exception of an approximately 250-foot-long section of steel pipe over the Middle Fork Rogue River that was installed following high flow damage to the original woodstave pipe in December 1964.

[2] The penstock includes 66”, 60”, 54”, and 48” segments.

[3] The static head is measured from the hydraulic gradient (3,352.37’) to the centerline of the penstock where it enters the turbine (2,639.0’).

Proposed

PacifiCorp proposes to replace the existing woodstave sag-pipe with a 63-inch-diameter, 5/16-inch-thick, steel flowline in the same alignment as the existing flowline. The steel flowline would be supported by concrete piers spaced at intervals of 40-feet on-center. The existing approximately 250-foot-long steel segment over the Middle Fork Rogue River would remain in-place. Construction is proposed for calendar year 2021.

1.1.9 Project Water Discharge

Water diverted from the South Fork Rogue to the Project powerhouse (Project Water) is conveyed directly from the Project tailrace to the Middle Fork Canal of the Prospect Nos. 1, 2, and 4 Hydroelectric Project located north of the Middle Fork Rogue on the slope opposite the powerhouse. This water is ultimately discharged from Middle Fork Canal into the North Fork Rogue at North Fork Reservoir. In general, Project Waters are not discharged to either the South Fork Rogue or Middle Fork Rogue. Therefore, the Project bypassed reach encompasses the South Fork Rogue River for 10.5 river miles to its confluence with the North Fork Rogue.

1.2 PROJECT HISTORY

1.2.1 Construction History

The Prospect Hydroelectric Plant (now known as the Prospect No. 1 powerhouse) was constructed on the North Fork Rogue River in 1911 by Condon Water and Power Company. By 1926, Condon Water and Power Company's successor, California Oregon Power Company (COPCO), initiated research and development of an expanded hydroelectric development incorporating multiple forks of the Rogue River, including the original 1911 Prospect facilities. New diversion dams were planned for the South, Middle, and North Forks of the Rogue River and Red Blanket Creek.

Byllesby Engineering and Management Company (Byllesby) of Chicago, Illinois was responsible for the design, engineering, and management of the South Fork development. The South Fork Rogue River was initially surveyed in September 1924. Additional survey and conceptual design work completed in 1926 shows three potential powerhouse and penstock locations for the South Fork development. The eventual layout and alignment for the South Fork development was proposed in July 1929.

The original application for the South Fork development was submitted to the Federal Power Commission (FPC) by Byllesby on April 20, 1931. The application identified the diversion dam site and 0.75 miles of conduit on 40 acres of Crater National Forest (now known as the Rogue River-Siskiyou National Forest), with the balance of lands owned by Rogue River Timber Company. A statement of intent to purchase timber lands within the proposed Project boundary was included with the application. The application identified a planned completion date of June 1, 1932.

Construction of the South Fork development known as Prospect No. 3 was initiated in 1931. The Project was placed in service on April 22, 1932. The current Project is largely unaltered in materials, massing, and/or alignment from its original construction condition with the exception of a section of the sag-pipe over the Middle Fork Rogue River; the forebay canal and associated side channel spillway; the fish passage facilities; and turbine runner. These alterations are discussed below in additional detail.

An original minor-part license (FPC No. 1163) was issued to COPCO on July 30, 1931 for a period of 50 years. This minor license covered the upper Project facilities, including the diversion dam and approximately 4,000 linear feet of the flowline, located on lands administered by the federal government. The initial major-part license (FPC No. P-2337) covering the downstream facilities, including the remaining waterway, penstock, and powerhouse, was issued in 1931 for a period of 30 years. COPCO merged with Pacific Power and Light on June 21, 1961, and the January 25, 1963 license application requested transfer of the license to Pacific Power and surrender of the minor-part license. By order dated July 8, 1964, the Commission issued a new license for the Project, including all Project facilities under one license for a period of 25 years. A subsequent license was issued on January 30, 1989 for a period of 30 years. A final license application (FLA) was submitted to FERC on December 30, 2016, and the current license was issued on September 27, 2019 for a period of 40 years, effective the first day of the month it was issued.

Construction plans dated July 1951 indicate that somewhere in this time frame a short section of the canal near the forebay was realigned, presumably because of observed slope instability. In 1982 a simple vertical and horizontal displacement monitoring system was installed on a head scarp identified immediately adjacent to this lower canal section. In April 1989, accelerated movement of approximately eight inches was measured over a five week period following snowmelt. Four borings were made in the area and equipped with slope inclinometer casings in addition to adjacent groundwater detection borings. It was determined that partial filling of the overflow spillway channel with rock was needed to provide protection for the toe of slope and to stabilize the block of soil immediately down slope from the canal. In September 1989, repairs were initiated, including installation of filter fabric over exposed soil surfaces and placement of 20,000 cubic yards of riprap material to a depth of approximately 25 feet and a distance of approximately 400 feet. Continued post-construction monitoring revealed that, after a period of initial settling, the slope had been stabilized.

A winter storm on December 21 and 22, 1964 resulted in the highest recorded flows during the Project era. High flows and extensive debris mobilization in the Middle Fork Rogue River resulted in damage to the sag-pipe piers and trestles and subsequent loss of the original woodstave sag-pipe crossing. Approximately 250 feet of the sag-pipe were replaced with steel pipeline in early 1965.

Prior to 1989, the Project included five existing wildlife crossings of the open canal and sporadic fencing. In fulfillment of License Article 406, PacifiCorp improved the five existing crossings, installed a new crossing over the open canal, repaired or replaced the fencing around the open canal with 7’-high wildlife fencing, installed two under-crossings of the woodstave flowline, and installed five under-crossings of the penstock.

Original construction of the Project diversion dam and intake canal included a fourteen-pool fish ladder and two eight-foot-wide rotating drum fish screens. Minor modifications were made to the upstream and downstream fish passage facilities in 1976, but significant modifications were made to both facilities in 1996 based on the requirements of License Articles 403, 404, and 405 of the 1989 license and interim design criteria provided by Oregon Department of Fish and Wildlife (ODFW) to PacifiCorp on September 7, 1994. Fish passage facility construction was initiated and completed in 1996. The rotating drum screens, which were located approximately 43' downstream of the intake, were removed, and the inclined plane screen was installed approximately 215' downstream of the intake. The fish bypass return pipe was installed from the new fish screen location to its terminus at Pool 6 of the fish ladder. Pool 14 of the existing ladder was bifurcated into two pools and several of the pool walls and weirs were modified to meet the provided design criteria. An access road to the diversion site and a bridge over the flowline were constructed to facilitate the fish passage construction effort. In addition to the backwater sluice gate, screen hoists, and other associated fish screen operation and maintenance infrastructure, a new cinder block control building and the automated Atlas Polar trash rake were installed at the diversion concurrent with the fish passage facilities construction in 1996.

The turbine runner was replaced in 1997. The original turbine was a vertical-shaft, Francis-type hydraulic turbine manufactured by Pelton Water Wheel and rated at 10,000 horsepower (7,460 kW) at a designed head of 693 feet. The new runner was manufactured by American Hydro and fabricated out of 304L stainless steel. In addition to the runner, new wicket gates and associated bushings were installed. Although the turbine capacity increased from 7,460 kW to 7,900 kW, generator capacity limits the installed capacity at 7,200 kW.

Following hydraulic assessments of fish passage facilities in 1998, perforated plate baffles were temporarily installed on the fish screen to create a more uniform flow through the screen. The baffles were redesigned and installed on the downstream side of the screen assembly in 2015.

Automation of the pressure-relief valve and tailrace backwater gate in response to forebay water levels was completed in 2015 and 2016, respectively.

The Project construction history is summarized below in Table 2.

Table 2. Project construction history

Facility	Construction Year
South Fork Diversion Dam	1931-1932
Fish ladder	1931-1932
Rotating drum fish screen	1931-1932
Conduit system	1931-1932
Powerhouse	1931-1932
Tailrace	1931-1932
Sag-pipe	1931-1932
Transmission Line	1931-1932
Forebay realignment	ca. 1951
Steel pipeline segment of sag-pipe	1965

Facility	Construction Year
Stabilization of forebay overflow spillway channel	1989
Wildlife crossings and canal fencing	1989
Modifications to fish ladder pool walls and weirs	1996
Inclined plane fish screen	1996
Fish return bypass pipe	1996
Turbine runner replacement	1997
Fish screen baffles	1998, 2015
Pressure-relief valve automation	2015
Tailrace backwater gate automation	2016

1.2.2 Compliance History

PacifiCorp has not been cited for a license violation during the current certification term, and has never received a Notice of Violation from the Commission related to the Project. No compliance variances were recorded during the current certification term.

The current LIHI certification included a single condition to notify LIHI of receipt of a new FERC license within 30 days of the FERC order issuing new license. The notification is required to describe all differences between the previous and new licenses that may be relevant to the LHI criteria. On October 2, 2019, Steve Albertelli, PacifiCorp License Program Manager, conducted a telephone conference with Maryalice Fischer of LIHI regarding issuance of the new FERC license of September 27, 2019. Ms. Fischer confirmed that she had a copy of the new license. Ms. Fischer concluded that the required description of differences between the previous and current FERC license could be provided by PacifiCorp in the pending recertification application contained herein. This conclusion was reached due to the short period remaining on the existing certification and the pre-existing need for a recertification application. Therefore, Condition 1 of the current certification is satisfied with submittal of this document from PacifiCorp to LIHI.

1.3 PROJECT OPERATIONS

The Project generator is operated automatically by a programmable logic controller (PLC), and may also be operated manually by an on-site operator, as needed. After normal working hours, plant functions may be monitored remotely over the supervisory control and data acquisition (SCADA) network by control operators at PacifiCorp's Hydro Control Center, in Ariel, Washington. Although control operators have the ability to adjust generation through the SCADA network, they generally allow the plant to run in automatic mode, and will call out an on-site operator for any unplanned outages or alarms.

The previous Project license identified a minimum instream flow of 10 cfs that must be maintained in the South Fork Rogue River below the diversion dam. The new Project license requires minimum in-stream flows in the South Fork Rogue River below the diversion dam to be 30 cfs from March 1 through July 31 and 20 cfs from August 1 through February 28. If natural inflow to the Project is less than the minimum flow requirement, then all flow will be discharged

into the bypassed reach. While there was no ramping requirement in the previous license, the new license requires PacifiCorp to implement an operational ramping rate of 0.2 feet per hour.

The Project is operated in run-of-river mode during low, mean, and high water years, as the small impoundment on the South Fork Rogue River lacks storage. A unit PLC, located in the plant, adjusts the aperture of the wicket gates in order to maintain a constant forebay elevation in response to input from level sensors at the forebay. The adjustments to the wicket gates directly affect the rate of water diversion at the dam, and ultimately result in a near-constant reservoir level for much of the year. When natural inflows exceed the sum of project hydraulic capacity and the minimum flow requirement, spill occurs at the diversion over the un-gated, ogee-style weir.

1.4 PROJECT WATERSHED

The Rogue River Basin of southwestern Oregon covers a drainage area of approximately 5,156 square miles from its headwaters on the west slope of the Cascade Mountains to its terminus at the Pacific Ocean in Gold Beach, Oregon. The approximately 215-mile Rogue River is delineated in three unique reaches or sub-basins (USGS, 2015):

- the Upper Rogue, from Boundary Springs, on the border of Klamath and Douglas Counties within the northern border of Crater Lake National Park (CLNP), downstream to the confluence with Little Butte Creek, three miles southwest of Eagle Point;
- the Middle Rogue, from Little Butte Creek downstream to the confluence with the Applegate River, six miles west of Grants Pass; and
- the Lower Rogue, from the Applegate River to the Pacific Ocean at Gold Beach.

The Project diversion dam is located at river mile (RM) 10.5 on the South Fork Rogue River, which is one of three major forks of the Upper Rogue—North, Middle, and South (Figure 2)—in the approximately 1,616-square-mile Upper Rogue River sub-basin. The South and Middle Forks of the Rogue originate from headwater springs, small lakes, and/or runoff in the Sky Lakes Wilderness Area of the Rogue River-Siskiyou National Forest (RR-SNF).

The South Fork Rogue River is approximately 26 miles in length and has a drainage area of approximately 251 squares miles, representing approximately five percent of the area in the Rogue River Basin. The stream originates at elevations between 5,600 feet and 5,700 feet in the South Blue Lake Group, a series of small lakes and springs in Sky Lakes Wilderness. For the first ten miles, the South Fork flows through a wide valley with a relatively low gradient. An elevation loss of approximately 1,000 feet occurs in this ten-mile headwater reach. At approximately ten miles below the source, the river flows into a canyon with a steep gradient. For the next five miles, the channel drops in elevation from approximately 4,600 feet to 3,400 feet as it flows through the canyon to the South Fork diversion dam at RM 10.5. The total drainage area upstream of the dam is approximately 83.1 square miles. There are no dams upstream of the Project. Downstream of the diversion, the Project-bypassed reach of the South Fork Rogue River enters a narrow canyon. For the majority of its course from the diversion dam to its confluence with North Fork Rogue River at Lost Creek Reservoir, the channel of the South Fork Rogue River is confined by the steep, sometimes sheer, walls of the canyon.

Downstream of the bypassed reach, Lost Creek Reservoir is impounded by the U.S. Army Corps of Engineers' William L. Jess Dam located on Rogue River mile 157 (see Figure 2). Jess Dam is the furthermost upstream barrier to anadromous fish passage in the Rogue River Basin.

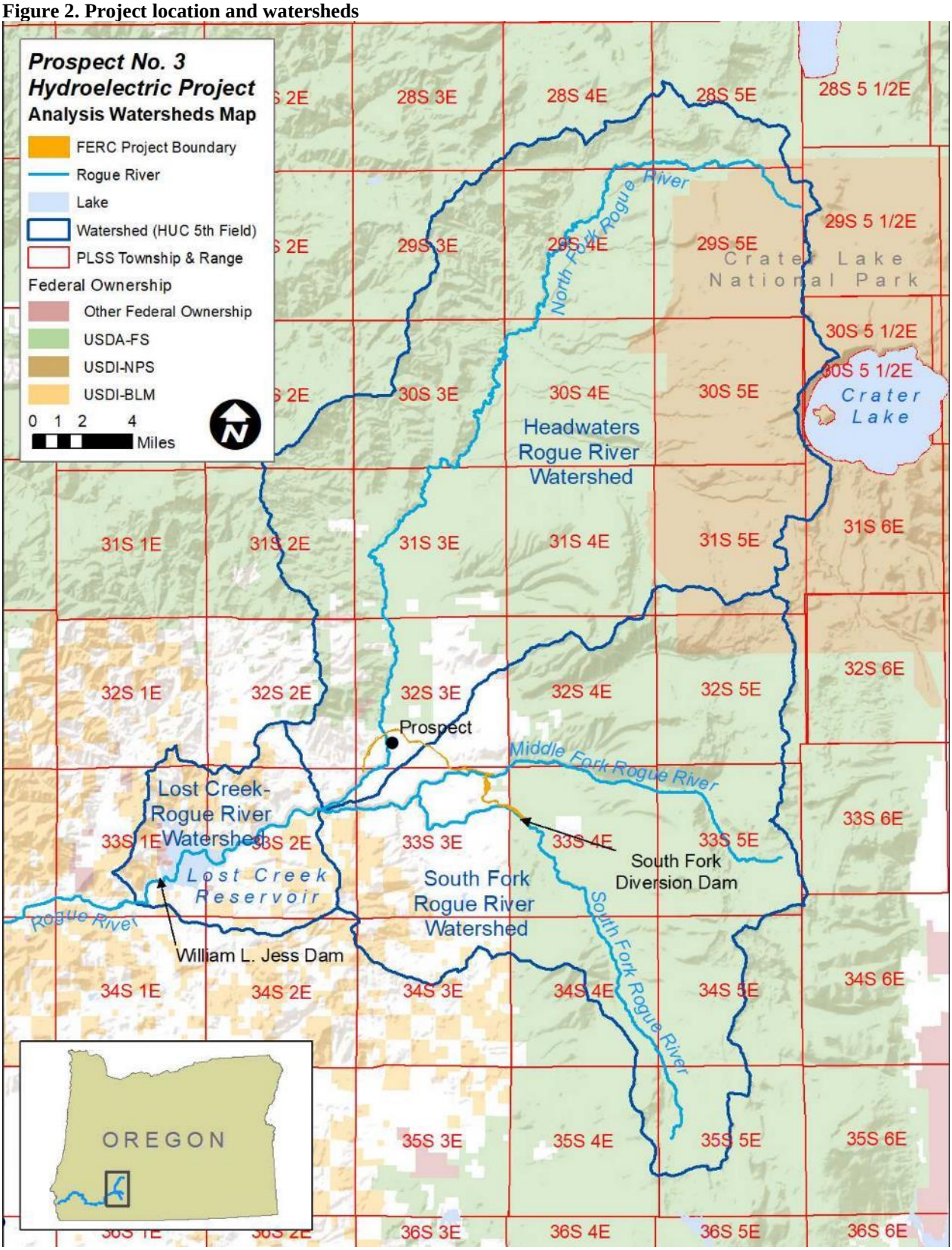
1.5 ZONES OF EFFECT

The waters affected or potentially affected by the current or proposed Project are the South, Middle, and North Forks of the Rogue River and Daniels Creek. The Project diversion dam is located at RM 10.5 of the South Fork Rogue. There are no agreements in place to regulate water inflows to the Project. Water diverted for generation from the impoundment at the South Fork diversion dam does not reenter the South Fork drainage, but is diverted northwest to the North Fork Rogue River via the sag-pipe from the Prospect No. 3 powerhouse tailrace to the Middle Fork Canal of the Prospect Nos. 1, 2, and 4 Hydroelectric Project (FERC No. P- 2630), which ultimately discharges flows to North Fork Rogue River at North Fork Reservoir. Thus, the reach of the South Fork Rogue River that is bypassed by the Project extends downstream from the dam to the terminus of the river at its confluence with the North Fork Rogue, a length of 10.5 miles.

Potential effects to Middle Fork Rogue and Daniels Creek are limited to emergency (i.e., non-routine) discharge of diverted flows via the forebay and tailrace spillways, which discharge to Daniels Creek. Daniels Creek is tributary to the Middle Fork Rogue immediately upstream of the Project powerhouse. The Middle Fork Rogue is ultimately tributary to the bypassed reach of the South Fork Rogue. In the event of a generating unit trip and subsequent rise in forebay water surface elevation, the generator pressure relief valve will automatically open to provide continuation of flow past the generating unit, into the tailrace, into the sag pipe, and ultimately into the Middle Fork Canal of the Prospect Nos. 1, 2, and 4 Project. Similarly, automation of the tailrace backwater gate has eliminated routine spill from the tailrace overflow to Daniels Creek and Middle Fork Rogue River. Any spill to these receiving waters from the forebay or tailrace overflow spillways would be on an emergency or non-routine (i.e., contrary to normal operations) basis. Therefore, normal operation does not impact water quality in Daniels Creek or Middle Fork Rogue River, and additional analysis of these waters is not provided herein.

Flows downstream of the South Fork diversion remain relatively consistent for approximately two miles. At approximately 2.4 miles downstream from the diversion, springs and groundwater inflows begin to contribute flow to the river. Significant groundwater sources have been identified between 2.8 and 3.5 miles downstream of the diversion (Campbell-Craven Environmental Consultants, 1986). In 2014, PacifiCorp measured groundwater contributions of approximately 26 cfs and 20 cfs in the South Fork bypassed reach at RM 7.0 in June and August, respectively (PacifiCorp, 2015). Additional flow sources further downstream include Buck Creek, Beaver Dam Creek, Smith Creek, the Middle Fork Rogue River, and four unnamed tributaries.

Figure 2. Project location and watersheds



There are three distinct zones of effect for the purposes of LIHI certification standards analysis. These zones are, in order from upstream to downstream:

(1) the Project facilities (see Section 1.1) within the FERC Project boundary from the South Fork impoundment to the discharge of the sag-pipe at Middle Fork Canal,

(2) the area within the ordinary high water mark of the bypassed reach from South Fork diversion dam to the confluence of South Fork Rogue River with North Fork Rogue River[4], and

(3) the portion of North Fork Reservoir that receives the discharge of Project Water via Middle Fork Canal, represented by the area within a 200-foot radius of the discharge point.

A flow chart and aerial overview map of the zones of effect are provided in Figures 3 and 4, respectively. Additional detail is provided in the aerial maps of Zones 1 and 3 in Figures 5 and 6, respectively. The zones of effect are individually evaluated for compliance with LIHI alternative standards in Section 2.0 of this application.

1.6 CHANGES SINCE LAST CERTIFICATION

On September 27, 2019, FERC issued a new 40-year operating license to PacifiCorp. The new license includes protection, mitigation, and enhancement measures that are different from the previous license, which was effective during the current LIHI certification term prior to September 1, 2019. The only immediate change at the time of License issuance was an increase in the minimum flow to the bypassed reach from 10 cfs to 30 cfs (see Section 1.3). PacifiCorp is also required to adhere to an operational ramping rate of 0.2 feet per hour in the bypassed reach. To date no other facility or operational changes have been implemented. Proposed facility changes are detailed in pertinent sub-sections of Section 1.1. Implementation of new protection, mitigation, and enhancement measures required by the FERC license are on-going and in compliance with the due dates established by the License as discussed in Section 2.0.

[4] Represented for display purposes only on map figures as a 50’ buffer on either side of the center line of the river.

Figure 3. Zones of effect conceptual flowchart

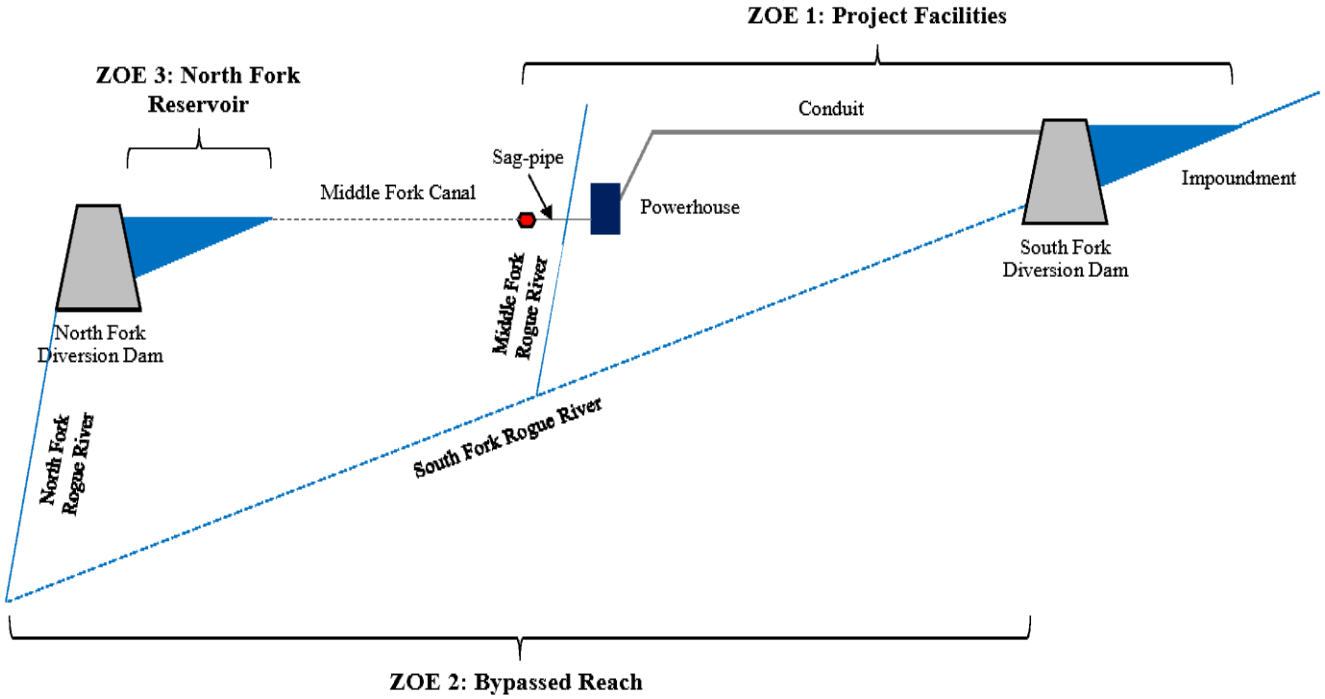


Figure 4. Aerial overview of zones of effect

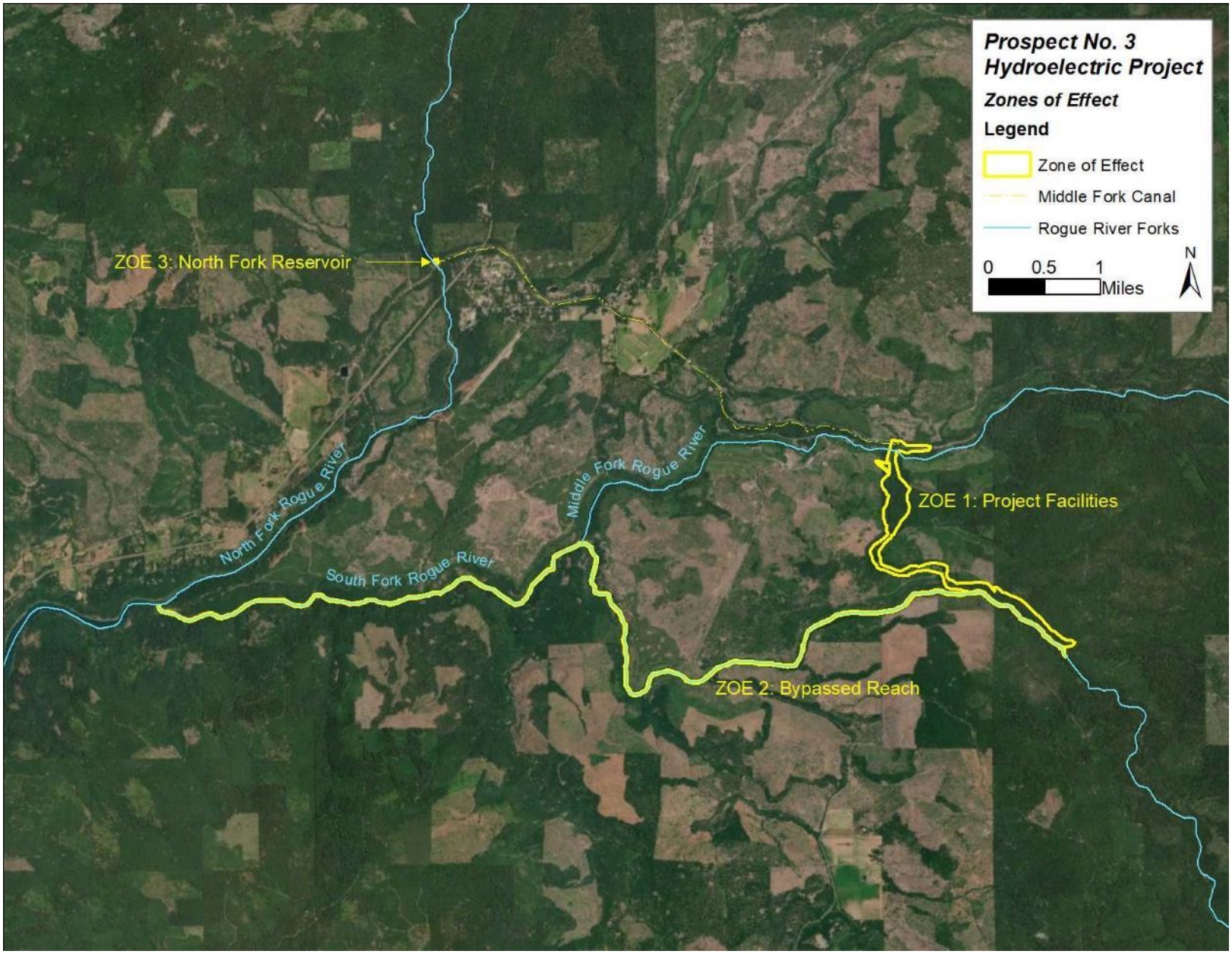


Figure 5. ZOE 1: Project facilities aerial map

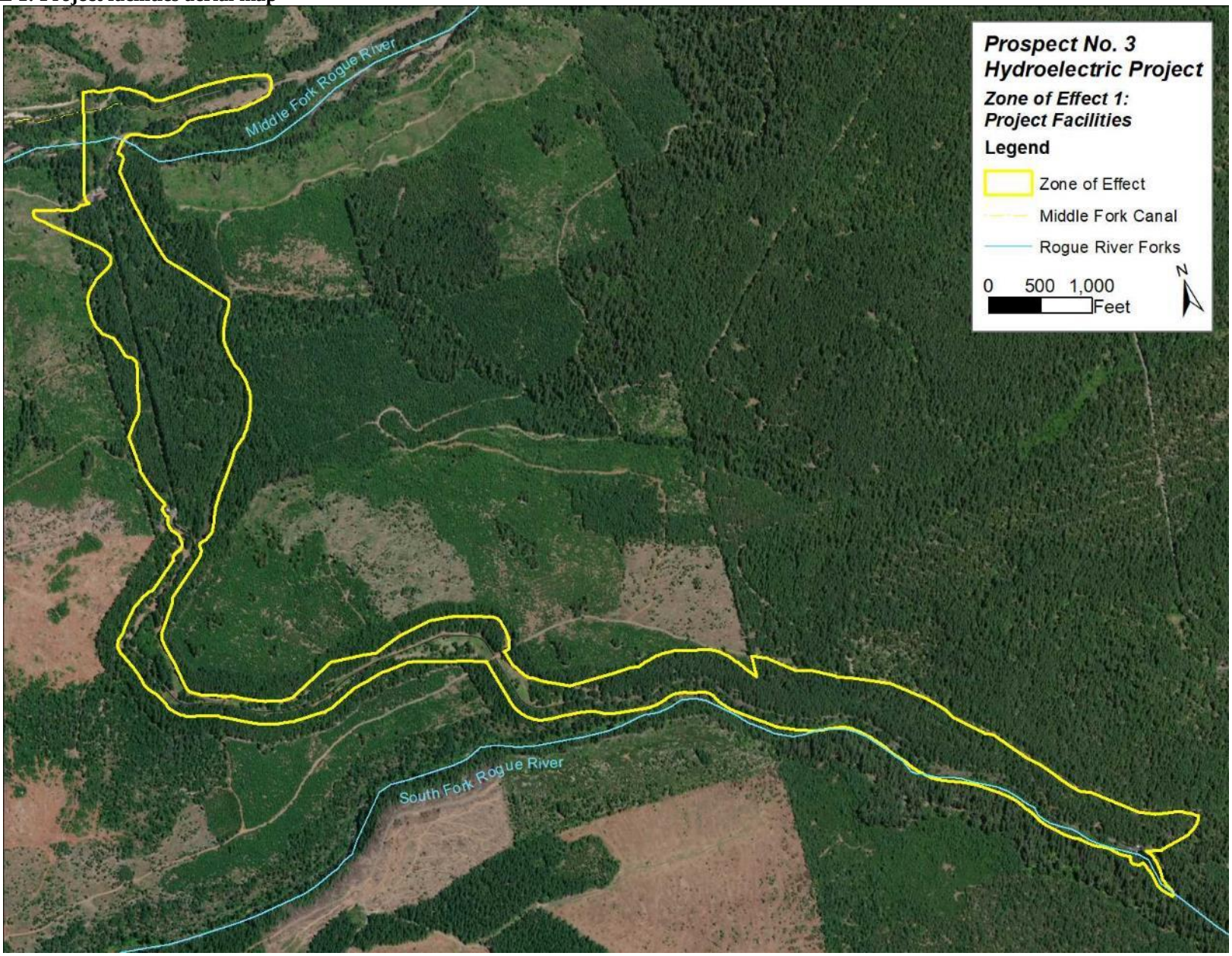
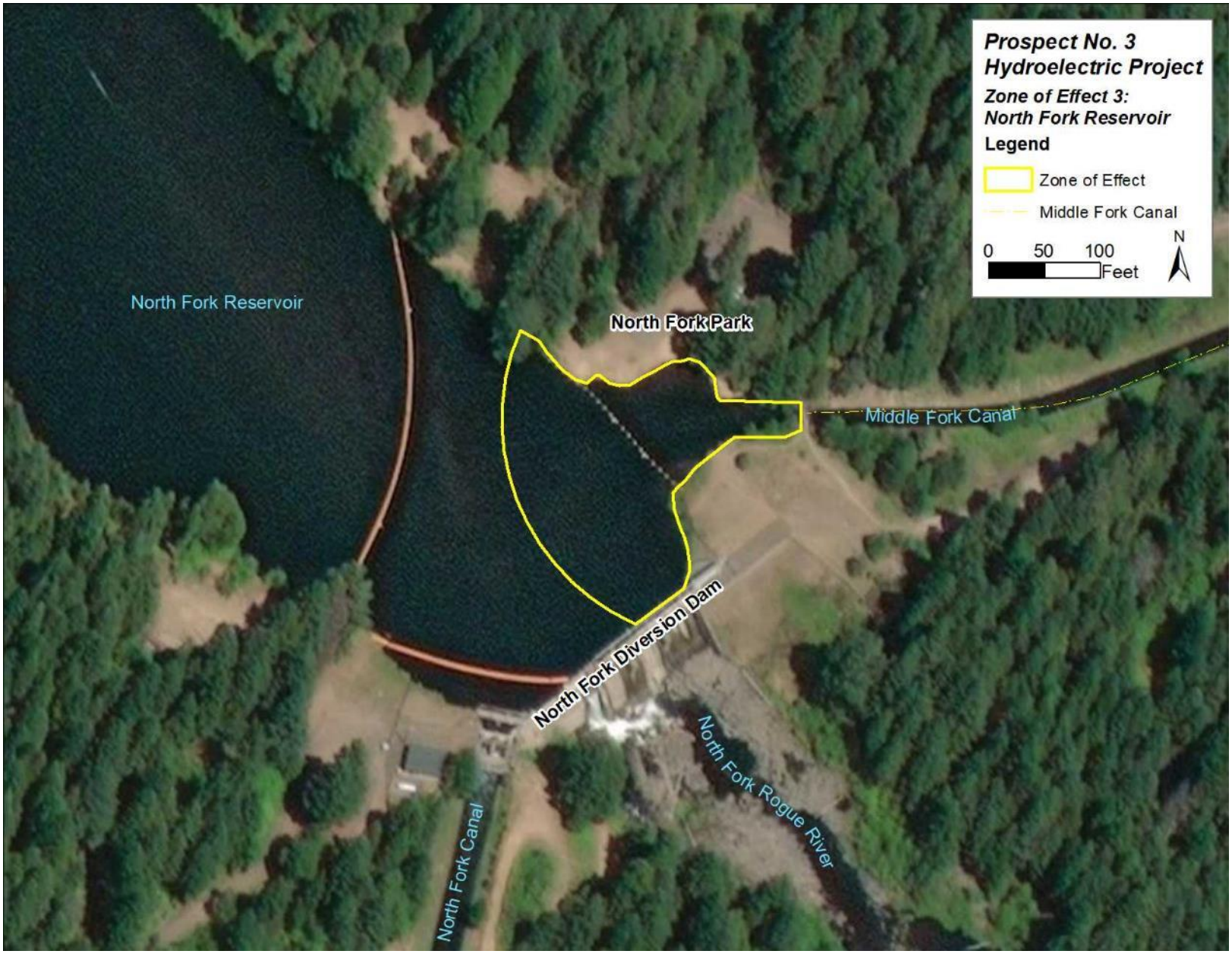


Figure 6. ZOE 3: North Fork Reservoir



2.0 CERTIFICATION STANDARDS

PacifiCorp reviewed the certification criteria and alternative standards outlined in LIHI's *Low Impact Hydropower Certification Handbook, 2nd Edition* (Revision 2.03: December 20, 2018) for each of the Zones of Effect (ZOE) identified in Section 1.5. Alternative standards matrices (Handbook Table B-1.2) were completed for each ZOE, as presented below, and the selected alternative standards for each ZOE are grouped by criterion and presented in the applicable sub-sections. The Project meets one or more of the alternative standards for each criterion and ZOE, and therefore, the Project is a candidate for recertification of low impact.

Table 3. Alternative standards matrix for ZOE 1: Project Facilities

Criterion		*Alternative Standards*				
		1	***2***	***3***	***4***	***Plus***
A	**Ecological Flow Regimes**		***X***			
B	**Water Quality**	***X***				
C	**Upstream Fish Passage**	***X***				
D	**Downstream Fish Passage**			***X***		
E	**Watershed and Shoreline Protection**		***X***			
F	**Threatened and Endangered Species Protection**		***X***			
G	**Cultural and Historic Resources Protection**		***X***			
H	**Recreational Resources**			***X***		

Table 4. Alternative standards matrix for ZOE 2: Bypassed Reach

Criterion		*Alternative Standards*				
		1	***2***	***3***	***4***	***Plus***
A	**Ecological Flow Regimes**		***X***			
B	**Water Quality**		***X***			
C	**Upstream Fish Passage**			***X***		
D	**Downstream Fish Passage**	***X***				
E	**Watershed and Shoreline Protection**		***X***			
F	**Threatened and Endangered Species Protection**		***X***			
G	**Cultural and Historic Resources Protection**	***X***				
H	**Recreational Resources**			***X***		

Table 5. Alternative standards matrix for ZOE 3: North Fork Reservoir

Criterion		*Alternative Standards*				
		1	***2***	***3***	***4***	***Plus***
A	**Ecological Flow Regimes**		***X***			
B	**Water Quality**	***X***				
C	**Upstream Fish Passage**	***X***				
D	**Downstream Fish Passage**	***X***				
E	**Watershed and Shoreline Protection**	***X***				
F	**Threatened and Endangered Species Protection**		***X***			
G	**Cultural and Historic Resources Protection**		***X***			
H	**Recreational Resources**		***X***			

2.1 CRITERION A - ECOLOGICAL FLOW REGIMES

Table 6. Ecological flow regime alternative standards matrix

Zone of Effect	*Criterion A Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities		***X***			
ZOE 2: Bypassed Reach		***X***			
ZOE 3: North Fork Reservoir		***X***			

STANDARD A-2. Agency Recommendation: The flow regime at the facility was developed in accordance with a science-based, agency recommendation.

2.1.1 ZOE 1: Project Facilities

The presence of a Project bypassed reach precludes selection of Alternative Standard A.1. ZOE 1 is subject to a flow regime developed in accordance with a science-based agency recommendation as detailed in the Project license, and therefore, Standard A-2 was selected for this zone. The relevance of ecological flow regimes in ZOE 1 is limited to the impoundment as the remainder of ZOE 1 is the Project conduit (i.e., non-fish or –wildlife habitat). Water Quality Certification Condition (Certification Condition) 1.a. and License Article 403 require the Project to be operated in run-of-river mode to minimize fluctuation of the impoundment surface elevation by maintaining discharge from the Project such that the sum of Project outflows approximates the sum of inflows to the Project.

At normal maximum pool, the impoundment has a surface area of approximately one acre. The retention time of impounded water is less than one hour. The impoundment has a gross storage capacity of approximately nineteen acre-feet and useable capacity of less than five acre-feet. Average and maximum depths are approximately five feet and eight feet, respectively.

There are no signs of shoreline instability as of the date of this application. There is no known recreational use in the impoundment to warrant a boat barrier. Accumulated sediments upstream of the diversion dam near the intake gate are removed as needed pursuant to requirements and conditions of the U.S. Army Corps of Engineers and Oregon Department of State Lands removal-fill permitting programs for jurisdictional Waters of the U.S./State. Removal of sediments from the impoundment was last conducted in 2010. There is currently minimal debris accumulation in the impoundment upstream of the dam and, therefore, minimal impact on Project operations.

2.1.2 ZOE 2: Bypassed Reach

ZOE 2 is subject to a flow regime developed in accordance with a science-based agency recommendation as detailed in the Project license, and therefore, Standard A-2 was selected for this zone. Certification Condition IV.e. requires a continuous minimum flow released from the diversion dam to the bypassed reach of equal to or greater than 30 cfs from March 1 through July 31 and equal to or greater than 20 cfs from August 1 through February 28 as measured at the United States Geological Survey (USGS) gage 14332000. If natural inflow to the Project is less than the minimum flow requirement, then all flow will be discharged into the bypassed reach. The required minimum flow is based on an in-stream flow study (PacifiCorp, 2015) conducted during Project relicensing. Certification Condition IV.f. and License Article 403 require year-round operational ramping rates of 0.2 feet per hour.

The reduction of "unimpaired flows" in the bypassed reach resulting from the diversion has the potential to impact native rainbow (*Oncorhynchus mykiss*) and cutthroat trout (*Oncorhynchus clarkii*) habitat, as well as other physical and biological processes, particularly in the upper 2.8 miles of the bypassed reach (RM 7.7 to RM 10.5), where water releases at the dam comprise 100 percent of instream baseflows. Although Project operations result in flow reductions throughout the 10.5-mile length of the bypassed reach, potential Project-related effects on habitat are considerably less below RM 7.7, due to flow augmentation from spring inflows, groundwater contributions, and tributaries, including the Middle Fork Rogue River.

An instream flow analysis was prepared pursuant to the current relicensing effort to assess expected changes in hydraulic conditions and fish habitat under various minimum flow scenarios in the bypassed reach of the South Fork Rogue River below the Project diversion dam. The analysis considers the effects of instream flow scenarios on the habitat of all life stages of cutthroat and rainbow trout. The instream flow analysis was directed at the upper section of the bypass reach from RM 10.5 (just below the dam) downstream to RM 7.0 (at the Butte Falls Highway Bridge). This upper section represents the portion of the bypass reach that is directly influenced by Project operations, prior to any downstream tributary input. This upper 3.5-mile section of the bypass reach consists of: (a) a 2.8-mile reach below the diversion dam where instream baseflows are comprised only of releases from the dam; and (b) a subsequent 0.70-mile reach where springs and groundwater inflows contribute to the instream baseflows. This analysis did not extend below RM 7.0, because flow augmentation from additional sources, including major tributaries, appreciably lessens the Project's operational influence over instream flows.

During the development of the Study Plan for instream flow analysis, resource agencies requested that PacifiCorp measure baseflow augmentation between RM 7.7 and 7.0. PacifiCorp measured river flows in the lower portions of the study reach in mid-June and early-August 2014 and found that appreciable baseflow augmentation was occurring. PacifiCorp measured flows of approximately 38 and 41 cfs in mid-June and early-August of 2014, respectively, at RM 7.0 (the Butte Falls Highway Bridge). At the same time, flows at the USGS gage at RM 10.25 (USGS gaging station 14332000) were recorded to be 12 cfs and 20 cfs, respectively. Comparison of the these measurements indicated that augmentations of approximately 26 cfs and 20 cfs were occurring in the bypassed reach between the two points in June and August, respectively. The current instream flow analysis assumes a conservative, reach-representative baseflow contribution of 16 cfs. This value was derived via a GIS-based area-weighted average calculation of baseflow contributions at mapped points of inflow.

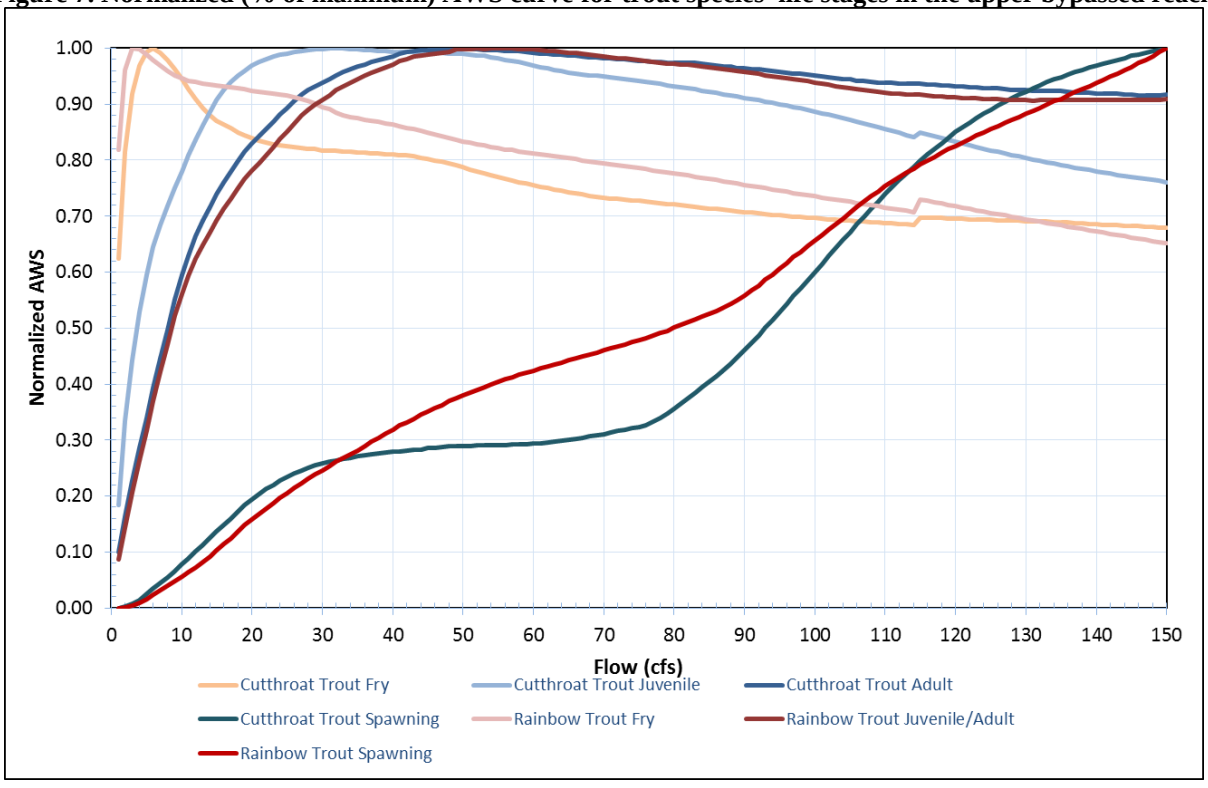
The instream flow analysis sought to: (1) model the hydraulic parameters (e.g. water surface elevation, velocity, wetted perimeter, etc.) of the bypassed reach under varying instream flow scenarios; and (2) compute the fish habitat expected to occur as a result of these hydraulic conditions under the various scenarios. The hydraulic and habitat simulations for this analysis were performed using the physical data collected from a 1986 (Campbell-Craven Environmental Consultants) study and refined by the 2014 fish habitat stream inventory conducted by Siskiyou Research Group. The instream flow models used for this analysis produce outputs and results that are assumed to remain applicable over time in a stream reach that is in a state of dynamic equilibrium.

The results of the analysis indicate that there is a lack of suitable trout spawning habitat, and this may be an important limiting factor to native trout in the bypassed reach. Spawning habitat limitations were also discussed as a likely limiting factor in the 1986 study report (Campbell-Craven Environmental Consultants). Spawning habitat in the bypassed reach may only be available in small patches in and around boulders, behind fallen logs, and other areas that allow gravel to accumulate. Although the transects used in this analysis are representative of the bypass reach, spawning area composed of small gravel patches (i.e., "pocket spawning") may not be adequately captured by the model.

PacifiCorp used the System for Environmental Flow Analysis (SEFA; Jowett et al., 2014) model to develop hydraulic models that predict velocity and depth across study transects placed in various habitat types in the bypassed reach. The output of the hydraulic models was then used in conjunction with approved habitat suitability curves (HSC) to produce habitat-flow relationships for target rainbow trout and cutthroat trout life stages, including fry, juvenile, adult, and spawning. The "habitat" value computed by the SEFA model is a value of Average Weighted Suitability (AWS) in units of square-feet of habitat per lineal foot of channel (ft^2 per ft.). To compare the relative abundance of the calculated habitat for each species' life stage to each other, the habitat-to-flow relationships are "normalized" so that AWS values at each flow are in terms of the percent of the highest simulated AWS across all flows. The normalized curves are shown in Figure 7.

Determining the inflection point of the habitat/flow relationship is a common procedure for assessing minimum flow requirements using habitat methods (Jowett 1997). For this analysis, the inflection point is defined as the point on the habitat/flow curve where the curve's slope changes from being greater than to less than 1:1. In other words, the curve's rise goes from being greater than to less than the run.

Figure 7. Normalized (% of maximum) AWS curve for trout species' life stages in the upper bypassed reach



Cutthroat Trout

Fry. Cutthroat trout fry habitat increases steeply as flows rise in the bypass to a peak habitat level that occurs at 6 cfs. At flows above 6 cfs, cutthroat trout fry habitat drops back down until

14 cfs after which the habitat essentially levels off, decreasing only gradually as flows increase. The habitat curve shape for cutthroat trout fry indicates a strong preference for low velocities, which occur mainly in habitat cells along the sides of the channel that are usually maximized at or below the inflection point of the wetted perimeter of the channel. Velocities tend to stay low along the stream margins even as flows rise. The shape of the fry habitat curve for the bypassed reach is similar to most habitat-flow curves for fry of most trout species in the western U.S, including rainbow trout.

Juvenile. Habitat for juvenile cutthroat trout increases steeply as flows rise to a peak habitat level at 32 cfs. The inflection point on the habitat-flow curve is at 20 cfs. At flows above 32 cfs, juvenile cutthroat trout habitat declines gradually as flow increases. The amount of computed habitat for juvenile cutthroat trout was relatively high across the range of simulated flows compared to the other species' life stages.

Adult. The adult cutthroat trout habitat-flow relationship is similar to the juvenile cutthroat trout relationship, except adult habitat does not increase quite as much as flows initially rise, and the peak occurs at a higher flow of 50 cfs. The inflection point on the habitat-flow curve is at 28 cfs. Habitat levels drop gradually at flows above 50 cfs.

Spawning and Egg Incubation. The total amount of spawning and egg incubation habitat for cutthroat trout is the lowest of all the life stages evaluated. There is little spawning habitat at lower flows, and cutthroat spawning habitat increases very gradually as flow increases. The HSC for spawning cutthroat show a relatively narrow preferred range of stream velocities from approximately 0.5 to 2.0 feet per second, which might partially explain why the calculated habitat quantities are low, but that is not likely the factor limiting spawning habitat. The limiting factor is most likely the high suitability assigned to gravel-only spawning substrates, with a very small level of spawning suitability assigned to cobble substrates. This limited substrate preference also limits the amount of habitat calculated. Gravel was only shown to exist at the edges of two transects. As flows increase, water levels rise, providing more of these edge cells with suitable depths and velocities, thereby increasing the habitat with increasing flows.

Rainbow Trout

Fry. The habitat-flow relationship for rainbow trout fry is similar to that described above for cutthroat trout. The habitat rises steeply with increasing flow to a peak habitat level at 3 cfs and then decreases gradually as flows increase above 3 cfs. Rainbow trout exhibit a slightly wider range of depth preference than cutthroat trout. As flows increase, the resultant depths are slightly more suitable over a slightly greater area for rainbow trout fry than for cutthroat fry.

Juvenile and Adult. Rainbow trout juvenile and adult habitat suitability are combined in the habitat calculations because their HSC were the same. Habitat rises as flows initially increase to a peak at 50 cfs. The inflection point on the habitat-flow curve is at 30 cfs. The HSC for rainbow trout are almost identical to adult cutthroat trout, and therefore, their respective habitat-flow relationships are nearly identical.

Spawning and Egg Incubation. The habitat-flow relationship calculated for rainbow trout spawning and egg incubation is similar to that described above for cutthroat trout spawning and

egg incubation. However, because the rainbow trout HSC for velocities is higher over a wider range of velocities, the amount of rainbow trout spawning habitat is slightly higher in the range of flows from 30 cfs to 90 cfs compared to cutthroat trout spawning habitat.

PacifiCorp proposed to implement minimum in-stream flows of 30 cfs from March 1 through July 31 and 20 cfs from August 1 through February 28 within the bypassed reach of the South Fork Rogue River below the South Fork Diversion Dam as measured at the USGS gage at RM 10.25. One method of evaluating normalized habitat graphs is to follow the lowest combined curve of the collective curves to see where the peak of the lowest combined curve occurs (i.e., where does the lowest ascending curve first cross a descending curve). The premise behind this method is that the peak of the combined lowest normalized line is at a flow that provides the maximum amount of habitat for the species' life stages being considered as a group. In Figure 10, the "bottom-line" peak, excluding spawning curves, occurs at 24 cfs, at which point, the maximum amount of habitat (approximately 82 percent of maximum AWS) for the combination of remaining curves would be achieved. More specifically, additional gains in juvenile/adult rainbow trout AWS are at the expense of cutthroat trout fry habitat. All other flows along the curve provide lesser AWS levels for at least one life stage in the group, with the exception of spawning, which increases to the limits of the model at 150 cfs. Inclusion of the spawning curves in the "bottom-line" analysis yields a peak of approximately 70 percent of maximum AWS at approximately 108 cfs. Additionally, the mean of the inflection points for cutthroat juveniles (20 cfs), cutthroat adults (28 cfs), and rainbow adults and juveniles (30 cfs) is 26 cfs. Finally, the hydraulic simulations of WSE prediction and velocities illustrated water surfaces rising relatively steeply as flows increase up to approximately 25 cfs and leveling off at higher flows. These modelled results justify scientifically-balanced selection of 30 cfs from March 1 through July 31 and 20 cfs from August 1 through February 28 for protection of fishery resources below the diversion dam. FERC supported this proposal in the EA, and Certification Condition IV.e. adopts PacifiCorp's proposed minimum flow regime.

Differences between PacifiCorp's proposed minimum flow regime and the flow regime identified in DEQ's initial Certification Conditions of February 7, 2019 were, in part, resolved by settlement agreement between PacifiCorp and DEQ signed on December 31, 2019. PacifiCorp agreed to complete four actions in lieu of DEQ's proposed flow regime and fish passage modifications. The four actions include the following:

1. PacifiCorp will provide, no later than December 31, 2020, $187,770 to WaterWatch of Oregon to fund implementation of or otherwise support the removal of three small, privately-owned diversion dams on Slate Creek and its tributary, Welter Creek ("Harboldt Dam Removal Project"). PacifiCorp will undertake follow-up monitoring to confirm that the dams have been removed and to provide a final report to DEQ, copying the Oregon Department of Fish and Wildlife (ODFW), at the completion of that project.

2. PacifiCorp will replace the two existing round, corrugated metal pipe culverts on Big Ben Creek below Forest Road 37 (T34S, R4E, S2, NESW) with a new culvert designed to U.S. Forest Service aquatic organism passage stream-simulation standards to restore upstream fish passage by December 31, 2021. The work includes timely obtaining all needed permits and approvals to carry out that work, subject to factors outside PacifiCorp's reasonable control, and to undertake follow-up monitoring to confirm that

the new culvert has been installed as designed to restore upstream fish passage and to provide a final report to the Department, copying the ODFW, at the completion of that project.

3. PacifiCorp will replace the existing round, 67' X 10', corrugated metal pipe culvert on Imnaha Creek below Forest Road 3775 (T33S, R4E, S17, NENW) with a new culvert designed to U.S. Forest Service aquatic organism passage stream-simulation standards to restore upstream fish passage by December 31, 2021. The work includes timely obtaining all needed permits and approvals to carry out that work, subject to factors outside PacifiCorp's reasonable control, and to undertake follow-up monitoring to confirm that the new culvert has been installed as designed to restore upstream fish passage and to provide a final report to the Department, copying the ODFW, at the completion of that project.

4. PacifiCorp will construct and install a self-cleaning, rotary drum screen that meets the 2011 National Marine Fisheries Service fish screening criteria to prevent fish entrainment in an irrigation ditch that diverts flows from Mill Creek into the North Fork Rogue River by December 31, 2021. The work includes timely obtaining all needed permits and approvals to carry out that work, subject to factors outside PacifiCorp's reasonable control, and to undertake follow-up monitoring to confirm that the fish screen has been installed as designed to prevent fish entrainment and to provide a final report to the Department, copying the ODFW, at the completion of that project.

The settlement agreement activities include the removal of three dams and the replacement of two culverts, all of which are barriers to upstream fish passage, and the screening of one diversion channel. Removal of the dams, which are downstream of the Project in the Applegate River watershed of the Lower Rogue sub-basin, would provide access to 15 miles (7.5 miles of pro-rated benefit for PacifiCorp's 50-percent share of funding) of year-round, high-quality habitat for native resident and anadromous fish, including threatened coho salmon. Replacement of the two culverts, which are upstream of the Project in the South Fork Rogue watershed, would provide access to approximately 14.32 miles of year-round habitat for native resident trout in the vicinity of the Project.

DEQ's initial flow regime of February 7, 2019 provides only an additional 9 percent increase in resident trout habitat via an increase of 10 cfs for three months over 2.8 miles of the bypassed reach. This must be weighed against providing year-round access to an additional 14.32 miles of in-proximity habitat to resident fish and an additional 7.5 miles of habitat to resident and anadromous fish, including threatened coho salmon, within the basin. These normalized 21.82 miles of overall fish habitat benefit are more than 2.5 times greater than the 8.1 miles of normalized fish habitat that would have benefited from the certification conditions of February 7, 2019. PacifiCorp's settlement agreement actions have a greater net benefit for ecological flows than the contested Certification Conditions of February 7, 2019. Therefore, DEQ's final Certification Conditions of February 6, 2020 adopt PacifiCorp's proposed minimum flow regime.

ODFW's recommended ramping rates were (1) one inch per hour during the period of May 1 – September 30 and (2) two inches per hour during the period of October 1 to April 30. ODFW

noted that the proposed ramping rates are consistent with FERC conditions at other hydroelectric projects and based in part on the results of PacifiCorp's Ramp Rate Study (2015) and recommendations from Hunter (1992). (ODFW. May 2017. Page 22). ODFW relies on the report produced by Hunter (1992) to help determine the ramping rate at hydroelectric facilities. Hunter recommended a ramping rate of 1 inch per hour to help protect salmon and steelhead fry. ODFW proposed 1 inch/hour from May 1 through September 30 to protect vulnerable emergent fry. After this date, the fish are larger and not as susceptible to stranding and thus the ramping rate can increase to 2 inch/hour. DEQ determined that implementing a year round operational ramping rate of 0.2 foot/hour will address PacifiCorp's concern that there is "noise" that may be as high as 0.1 foot/hour at the stage gage (USGS 14332000), and this requirement was included as Certification Condition IV.f.

License Article 406 requires PacifiCorp to prepare and file a sediment and dredging plan for dredging the impoundment and placing the dredged material along the bypassed reach stream bank for the purpose of enhancing downstream trout habitat. In addition, License Article 407 requires PacifiCorp to place any large woody debris removed upstream of the dam to locations downstream of the dam that, during high flow events, could reasonably be expected to result in the transport of large woody debris. The pass-through of sediments and large woody debris from upstream of the dam to downstream of the dam will partially restore hydrogeomorphic function and potentially ameliorate the lack of suitable spawning gravels in the bypassed reach.

2.1.3 ZOE 3: North Fork Reservoir

The presence of a Project bypassed reach precludes selection of Alternative Standard A.1. ZOE 3 is subject to a flow regime developed in accordance with a science-based agency recommendation as detailed in a FERC license (though not the Prospect No. 3 License), and therefore, Standard A-2 was selected for this zone. Project Water is discharged to receiving waters at the North Fork Reservoir, an impoundment of North Fork Rogue River created by the North Fork Dam, a licensed facility of the Prospect Nos. 1, 2, and 4 Hydroelectric Project (FERC No. P-2630). Project Waters mix with diversions from Middle Fork Rogue and Red Blanket Creek within the Middle Fork Canal upstream of North Fork Reservoir. The ultimate disposition of Project Waters is subject to the flow regimes required by the P-2630 license, but the influence of Project Waters within North Fork Reservoir is limited. During March through June (the period when the Project can attain the maximum diversion of 150 cfs) of Water Year (WY) 2019, Project Waters accounted for, on average, less than 9 percent of the total inflow assuming maximum P-2630 diversions (total maximum diversion of 225 cfs) and hourly average inflow of 1,488 cfs from the North Fork Rogue upstream of the dam. License Article 403 for P-2630 requires PacifiCorp to operate the project in run-of-river mode for the protection of aquatic resources and to minimize fluctuation of North Fork Reservoir surface elevations such that the sum of outflows approximates the sum of inflows to the reservoir. Project Waters do not contribute to non-attainment of License Article 403.

2.2 CRITERION B - WATER QUALITY

There are no Clean Water Act Section 303(d) listings of impaired water bodies in the South Fork Rogue River watershed or other Project-affected waters (DEQ 2008).

Table 7. Water quality alternative standards matrix

Zone of Effect	*Criterion B Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities	***X***				
ZOE 2: Bypassed Reach		***X***			
ZOE 3: North Fork Reservoir	***X***				

STANDARD B-1. Not Applicable/De Minimis Effect: The facility does not alter the physical, chemical, or biotic water characteristics necessary to support fish and wildlife resources or human water uses (e.g., water supply or recreation); or

STANDARD B-2. Agency Recommendation: The facility is in compliance with all water quality conditions contained in a recent Water Quality Certification or science-based resource agency recommendation providing reasonable assurance that water quality standards will be met for all waterbodies that are directly affected by the facility. Such recommendations, whether based on a generally applicable water quality standard or one that was developed on a site-specific basis, must include consideration of all water quality components necessary to preserve healthy fish and wildlife populations, human uses and recreation; or

2.2.1 ZOE 1: Project Facilities

See Project impoundment description in Section 2.1.1. The retention time of impounded water is less than one hour, and therefore, the impoundment is unlikely to alter the physical, chemical, or biotic characteristics necessary to support fish and wildlife resources or human water uses. Project relicensing studies and agency recommendations did not identify any water quality impacts within the impoundment or Project waterway. Potential impacts within the impoundment were addressed in DEQ's Evaluation and Findings Report (2020) and the subsequent Certification. Therefore, ZOE 1 exhibits a de minimis effect to water quality.

2.2.2 ZOE 2: Bypassed Reach

The facility is in compliance with all water quality conditions contained in the Certification issued by DEQ on February 6, 2020, which provides reasonable assurance that water quality standards will be met for all waterbodies that are directly affected by the facility. PacifiCorp performed water quality studies of water temperature, dissolved oxygen, pH, and turbidity pursuant to an approved study plan during Project relicensing (PacifiCorp 2016). With the exception of dissolved oxygen, study results identified water quality in the bypassed reach as being within state numeric criteria. In their Evaluation and Findings Report (2020) and based on existing studies or best professional judgement, DEQ concluded that the following water quality standards were not affected by Project operations: fungi, taste and odors, bottom or sludge deposits, aesthetic conditions, radioisotopes, toxic substances, pH, bacteria, nuisance algae growth, total dissolved solids, or temperature. DEQ determined that the following water quality standards were of potential concern: dissolved oxygen; discoloration, oily sheen, or oily coatings; total dissolved gas (TDG); turbidity; biocriteria; statewide narrative criteria related to

fish and other aquatic life; and antidegradation. The Certification includes four specific (i.e., non-general) conditions to address standards of concern: I. Project Operation, II. Dissolved Oxygen, III. Total Dissolved Gas, and IV. Biological Criteria; Statewide Narrative Criteria; Protection of Designated Beneficial Uses; Antidegradation; Compliance with Other Appropriate Requirements of State Law.

The Project Operation conditions require operating the Project in run-of-river mode with a maximum diversion of 150 cfs from the South Fork Rogue. Run-of-river operation is ensured as the dam spillway is an ungated, ogee-style spillway and the impoundment does not have any appreciable storage. The Operation Compliance Monitoring Plan required by License Article 404 will monitor and report the operational requirements of the license, including compliance with run-of-river operation.

Study results demonstrated that the Project attains the cold-water dissolved oxygen criterion of 8 mg/L (OAR 340-041-0016(2)) from August through October in the bypass reach of the South Fork Rogue River. However, dissolved oxygen monitoring indicates non-attainment of the 11 mg/L spawning criterion (OAR 340-041-0016(1)) in the South Fork Rogue River during at least part of the spawning period (February through July). The increased minimum flow under the new license is likely to result in increased dissolved oxygen levels and attainment of the dissolved oxygen criteria. DEQ included dissolved oxygen monitoring in the South Fork Rogue River as Condition II of the Certification to determine whether the dissolved criteria are attained year round in the bypass reach. PacifiCorp submitted a second draft of the dissolved oxygen monitoring plan for review and approval by DEQ on February 7, 2020. Dissolved oxygen monitoring is scheduled to begin in April 2020. If monitoring indicates non-attainment of the dissolved oxygen criteria, PacifiCorp must propose and implement measures under an adaptive management plant to ensure attainment of the criteria (Condition II.e).

Certification Condition III requires PacifiCorp to submit annual water quality monitoring reports to DEQ summarizing the frequency of spill events to Daniels Creek. PacifiCorp submitted the first of these annual reports to DEQ on January 30, 2020. At DEQ's discretion, PacifiCorp may be required to submit a TDG Monitoring Plan to DEQ addressing TDG monitoring and reporting requirements of Conditions III.c., d., and e. If DEQ determines monitoring indicates TDG criteria are not met, PacifiCorp shall develop a TDG adaptive management plan.

No potential concerns with TDG at the forebay and tailrace overflow spillways were raised throughout the 5.5-year FERC relicensing process, including during the water quality study plan development, until issuance of the draft Certification. Any flows that discharge from the forebay on a non-routine, emergency basis spill over the forebay canal weir (approximately 4 feet high) to a concrete transition structure before entering the approximately 25-foot-wide by 400-foot-long, rock-reinforced spillway channel section and the subsequent, approximately 2,000 feet of natural channel that discharges to Daniels Creek. The limited head over the canal wall; the lack of a ponded or deep receiving water; and the shallow, rocky spillway channel limit the potential for atmospheric gas entrainment and dissolution. Similar conditions are observed in the tailrace overflow channel. Flows spilling over the 5-foot-deep tailrace enter a 172-foot-long, concrete-lined channel that discharges to a rocky, incised reach of Daniels Creek. At no point do Project overflows spill with high pressure directly to open water. Furthermore, the tributary convergence

with Middle Fork Rogue River would contribute to mixing and dissipation of gases from Daniels Creek within Middle Fork Rogue River downstream of the convergence.

As acknowledged by DEQ in Table 8 of the Evaluation Report, automation of the turbine pressure relief valve (PRV) has eliminated routine spill from the forebay overflow spillway to Daniels Creek. In the event of a generating unit trip and subsequent rise in forebay water surface elevation, the PRV will open to provide continuation of flow past the generating unit, into the tailrace, into the sag pipe, and ultimately into the Middle Fork Canal of the Prospect Nos. 1, 2, and 4 Hydroelectric Project. Similarly, automation of the tailrace backwater gate has eliminated spill from the tailrace overflow to Daniels Creek. Any spill to these receiving waters from the forebay or tailrace overflow spillways would be on an emergency or non-routine (i.e., contrary to normal operations) basis. Therefore, normal operation would not result in forebay or tailrace spills, nor would the circumstances of any such spill be likely to create TDG saturation levels in excess of the water quality standard in Daniels Creek or Middle Fork Rogue River.

Certification conditions IV.a. through IV.c. require PacifiCorp to develop and implement a Macroinvertebrate Monitoring Plan for the South Fork Rogue River downstream of the dam. PacifiCorp submitted a draft of the macroinvertebrate monitoring plan for review and approval by DEQ on February 10, 2020. Furthermore, if DEQ determines that the biocriteria standard is not met, DEQ may require PacifiCorp to develop and implement a biocriteria adaptive management plan pursuant to condition IV.d.

There is limited potential for the Project to cause or contribute to exceedances of the biocriteria standard with respect to macroinvertebrates in the South Fork Rogue River. The quality of the water in the South Fork Rogue River is excellent, and the Project and its operations have limited effects on the river in any way that is likely to have an adverse effect on macroinvertebrate communities. DEQ's Evaluation and Findings Report does not dispute these arguments and information, but states only that no macroinvertebrate data is available for the South Fork Rogue River.[5]

Certification conditions IV.e. through IV.h. concerning minimum flows and ramping are addressed above in Section 2.1.2. Certification conditions IV.i through IV.l. relating to fish passage facilities are addressed below in Sections 2.3.1 and 2.4.2.

2.2.3 ZOE 3: North Fork Reservoir

See description of North Fork Reservoir in Section 2.1.3. Water quality impacts in the North Fork Reservoir are addressed via the Water Quality Certification for P-2630, which is in compliance with the conditions of its respective certification. Therefore, Project impacts on water quality in this ZOE are de minimis.

[5] PacifiCorp further notes that, even if such data were collected, DEQ has not identified any qualitative or quantitative metrics for the evaluation of macroinvertebrate monitoring results.

2.3 CRITERION C - UPSTREAM FISH PASSAGE

Fish evaluated for this criterion include native, resident rainbow trout and cutthroat trout. There is no anadromy or catadromy in the ZOEs as William L. Jess dam, downstream of the Project, is the furthermost upstream barrier to migration in the Rogue Basin.

Table 8. Upstream fish passage alternative standards matrix

Zone of Effect	*Criterion C Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities	***X***				
ZOE 2: Bypassed Reach			***X***		
ZOE 3: North Fork Reservoir	***X***				

STANDARD C-1. Not Applicable/De Minimis Effect: The facility does not create a barrier to upstream passage, or there are no migratory fish in the vicinity of the facility and the facility is not the cause of extirpation of species that were present historically; or

STANDARD C-3. Best Practice/Best Available Technology: In the absence of applicable resource agency fish passage recommendations, the facility includes well-designed, well-operated upstream fish passage methods or technologies that are appropriate for all migratory fish species that occur in the area affected by the facility. These methods should enable safe, timely, and effective fish passage at all barriers associated with the facility and include provisions for appropriate monitoring and effectiveness determinations.

2.3.1 ZOE 1: Project Facilities

See Project impoundment description in Section 2.1.1. Fish are excluded from the Project waterway by an inclined plane fish screen (see Section 2.4.1). Fish upstream of the fish screen and Project diversion dam are capable of moving upstream from the Project impoundment, and there are no further Project-related barriers to upstream fish passage. Therefore, ZOE 1 exhibits a de minimis effect to water quality and Standard C-1 applies.

2.3.2 ZOE 2: Bypassed Reach

These zones of effect are jointly analyzed for this criterion due to the nexus of upstream (Project facilities) and downstream (bypassed reach) zones with respect to upstream fish passage, which by definition connects these two zones. Standard C-3 was selected as the alternative standard because the facility is not in compliance with recommendations issued by appropriate resource agencies, in this case ODFW. FERC did not adopt ODFW's 10(j) recommendations with respect to fish passage. PacifiCorp contends that the existing upstream fish passage facilities provide appropriate fish passage for the species that occur in the area affected by the facility. Though fish passage mitigation will be provided pursuant to a settlement agreement with DEQ and Standard C-4 applies to this Criterion, Standard C-3 was selected because the facility has existing fish passage facilities that are effective for the majority of fish in the South Fork Rogue River as described herein. Certification conditions IV.i. and j. require the fish passage facilities to be operated and maintained in accordance with a DEQ-approved Fish Passage Facilities Operations and Maintenance Plan.

There are no anadromous fish in the South Fork Rogue River. Upstream fish migration within the basin is blocked downstream of the Project by the U.S. Army Corps of Engineers' William L. Jess Dam. The South Fork Rogue River does not contain any fish that are listed as threatened or endangered under the Endangered Species Act. The Project includes both upstream and downstream fish passage facilities at the diversion dam for resident fish, including native rainbow and cutthroat trout. Upstream passage is provided by an 86-foot-long, concrete pool-and-weir fish ladder with 15 pools of varying dimensions. Downstream passage is provided by a fish screen that excludes fish from the Project waterway and diverts them to an 18-inch bypass pipe that transports them to the sixth pool in the fish ladder. The bypass return pipe discharge adds flow to the downstream end of the fish ladder (*i.e.*, Pools 1 through 6), thereby increasing attraction flow to the ladder entrance. PacifiCorp proposes to construct an auxiliary bypass flow system to reliably provide minimum flows to the bypass reach, and this bypass system will also permit safe passage of fish moving downstream to a pool at the base of the fish ladder.

There is no Project-specific evidence that the ladder limits upstream migration for relevant life stages or harms fish. To the contrary, studies of the Project's fish passage facilities in 2015 and 2016 demonstrated that fish *at least* as small as 110 millimeters (mm) in length (4.3 inches) successfully ascended the ladder, and that fish of this size or larger constitute the majority of fish in the river. Fish smaller than 110 mm are more likely to hold localized positions in the river and less likely to migrate upstream due to physical constraints and life history needs. Furthermore, there is no evidence that resident trout populations in the river upstream and downstream of the dam are geographically or genetically isolated from each other.

Pursuant to FERC's ILP, PacifiCorp developed a study plan (2015) to evaluate the effectiveness of existing fish passage facilities. The study plan was prepared in consultation with stakeholder agencies, including DEQ and ODFW, and included evaluation of physical parameters (e.g., jump height, velocities, pool depth, et al.) and biological effectiveness. The studies conducted in 2015 and 2016, as reported in the Updated Study Report: Fish Passage Facilities (May 2016), concluded that Project fish passage facilities provided effective passage opportunities for the critical life stages of migrating fish in the South Fork Rogue River. Given the results of the fish passage studies and subsequent consultations with DEQ and ODFW, PacifiCorp's revised proposed Project (2018) did not include fish passage modifications. FERC concurred with PacifiCorp's fish passage conclusions and concluded in its Environmental Analysis (2017, page 48) that "there would be little to no benefit to fry and juvenile trout from modifying the fish ladder."

PacifiCorp's conclusion is based on observations of tagged fish between 110 mm and 207 mm successfully ascending the ladder during the biological evaluation of Project fish passage facilities conducted pursuant to the FERC relicensing process. The majority (73%) of trout observed during snorkel surveys were in the 100 mm to 200 mm size class. Snorkel survey data does not provide finer scale on size distribution, but it is unlikely that most of the fish in this size class were less than 110 mm. Therefore, the fish ladder demonstrably provides passage for the majority of trout in the bypassed reach. ODFW notes that "smaller fish are currently unable to use the ladder, and therefore would not have been documented during the relicensing studies" (Evaluation Report, page 39). These statements misrepresent the fish passage study plan, methods, and results. The smallest fish in the upstream passage evaluation was 89 mm. Results show that eight fish between 89 mm and 105 mm were not observed to successfully ascend the

ladder, however it should not be concluded that all "smaller fish are currently unable to use the ladder."

The lengths of the eight fish observed successfully ascending the ladder during the evaluation were 110 mm, 122 mm, 126mm, 144 mm, 157 mm, and 207 mm. Two separate fish (Tag Numbers 286 and 528) measuring 110 mm ascended the ladder. One of the 110 mm fish was sourced from upstream of the dam while the other was sourced from the bypassed reach (i.e., downstream of the dam). The fish measuring 207 mm ascended the ladder twice (June 12, 2015 and July 7, 2015). The Evaluation Report (page 40) concurs with ODFW's findings that the "primary benefits to providing adequate passage at the South Fork Dam would be to mitigate for habitat fragmentation and connect the rainbow and cutthroat trout populations within the South Fork (allow genetic exchange and interaction between them), and improve the opportunity for expression of fluvial (migratory) life histories," but the successful upstream passage observed during the evaluation demonstrates that these benefits are already available to the resident trout population through use of the existing fish passage facilities. The evaluation proved that resident trout are capable of moving upstream, thereby indicating that genetic exchange and expression of fluvial life histories are possible with the existing facilities. There is no evidence that fish passage facility modifications are necessary to assure compliance with Oregon's narrative water quality standards, including the protection of "trout migration."

Of note is that the largest fish tagged during the upstream passage study did not ascend the fish ladder. This 215 mm fish was detected sporadically for a few days in the vicinity of Pool 1 after release and was never detected again. It was originally captured in the plunge pool at the base of the diversion dam via angling, and it is possible that this fish returned to the dam plunge pool after release in Pool 1 of the fish ladder. This does not mean that fish less than or equal to 215 mm are unable to use the ladder. The only valid conclusion is that this individual fish did not ascend the ladder. Furthermore, observation of this fish speaks to the issue of individual preference or inclination, which is critical to understanding fish passage evaluation results.

During the Project fish passage study, upstream-origin fish exhibited an upstream passage rate of 80%, and downstream-origin fish exhibited an upstream passage rate of 10%. These data, while based on a statistically small sample size, suggest that site selection of naturally-produced, resident trout may bias estimates of passage rate. Fish located downstream of the dam may not have attempted upstream migration prior to the test or may be inclined to remain downstream for any number of reasons. Fish located upstream of the dam may have a naturally higher tendency to ascend the ladder and return to their local home range than fish from downstream. The Evaluation Report (page 41) cites results from the North Umpqua Hydroelectric Project's Lemolo No. 2 fishway evaluation as an example of an acceptable upstream passage rate. In the Lemolo No. 2 study, all tagged fish originated from upstream of the dam and fishway, and the upstream passage rate was 71%, less than the 80% passage rate for upstream-origin fish in the Project evaluation.

DEQ's Findings and Evaluation Report also does not identify evidence demonstrating that reconstructing the fish ladder to limit jump heights to nine inches or less would provide additional benefits. There is no evidence that this would improve habitat fragmentation, genetic exchange, or expressions of fluvial life histories, or provide other significant benefits to resident fish populations. Indeed, FERC's Environmental Analysis of the Project concluded that "there

would be little to no benefit to fry and juvenile trout from modifying the fish ladder," and FERC reiterated this conclusion in the License. License, ¶ 54.

With respect to flows through the fish ladder, DEQ's Findings and Evaluation Report states that the current bypass outflow location in the sixth pool of the ladder increases fry mortality and causes delayed or blocked migration with increased associated mortality and reduced productivity. The Report does not identify, and PacifiCorp is not aware of, any evidence of these conditions occurring at the Project. The Report also raises concerns about larger fish feeding on smaller fry as they exit the fish ladder, but moving the fish bypass return pipe outlet from Pool 6 to another location in the river will only relocate any such effects to another location in the river. In addition, the fish bypass flow provides beneficial attraction flows to the ladder, as specified in the ladder's design, which was developed in consultation with ODFW and the U.S. Fish and Wildlife Service. Removing this attraction flow from the ladder may reduce its effectiveness.

The existing facility design and operation are appropriate for the migratory species that occur in the area affected by the facility. Differences between PacifiCorp's proposed Project and the fish passage modifications identified in DEQ's initial Certification Conditions of February 7, 2019 were, in part, resolved by settlement agreement between PacifiCorp and DEQ signed on December 31, 2019. PacifiCorp agreed to complete four actions in lieu of DEQ's proposed flow regime and fish passage modifications. The four actions include the following:

1. PacifiCorp will provide, no later than December 31, 2020, $187,770 to WaterWatch of Oregon to fund implementation of or otherwise support the removal of three small, privately-owned diversion dams on Slate Creek and its tributary, Welter Creek ("Harboldt Dam Removal Project"). PacifiCorp will undertake follow-up monitoring to confirm that the dams have been removed and to provide a final report to DEQ, copying the Oregon Department of Fish and Wildlife (ODFW), at the completion of that project.

2. PacifiCorp will replace the two existing round, corrugated metal pipe culverts on Big Ben Creek below Forest Road 37 (T34S, R4E, S2, NESW) with a new culvert designed to U.S. Forest Service aquatic organism passage stream-simulation standards to restore upstream fish passage by December 31, 2021. The work includes timely obtaining all needed permits and approvals to carry out that work, subject to factors outside PacifiCorp's reasonable control, and to undertake follow-up monitoring to confirm that the new culvert has been installed as designed to restore upstream fish passage and to provide a final report to the Department, copying the ODFW, at the completion of that project.

3. PacifiCorp will replace the existing round, 67' X 10', corrugated metal pipe culvert on Imnaha Creek below Forest Road 3775 (T33S, R4E, S17, NENW) with a new culvert designed to U.S. Forest Service aquatic organism passage stream-simulation standards to restore upstream fish passage by December 31, 2021. The work includes timely obtaining all needed permits and approvals to carry out that work, subject to factors outside PacifiCorp's reasonable control, and to undertake follow-up monitoring to confirm that the new culvert has been installed as designed to restore

upstream fish passage and to provide a final report to the Department, copying the ODFW, at the completion of that project.

4. PacifiCorp will construct and install a self-cleaning, rotary drum screen that meets the 2011 National Marine Fisheries Service fish screening criteria to prevent fish entrainment in an irrigation ditch that diverts flows from Mill Creek into the North Fork Rogue River by December 31, 2021. The work includes timely obtaining all needed permits and approvals to carry out that work, subject to factors outside PacifiCorp's reasonable control, and to undertake follow-up monitoring to confirm that the fish screen has been installed as designed to prevent fish entrainment and to provide a final report to the Department, copying the ODFW, at the completion of that project.

The settlement agreement activities include the removal of three dams and the replacement of two culverts, all of which are barriers to upstream fish passage, and the screening of one diversion channel. Removal of the dams, which are downstream of the Project in the Applegate River watershed of the Lower Rogue sub-basin, would provide access to 15 miles (7.5 miles of pro-rated benefit for PacifiCorp's 50-percent share of funding) of year-round, high-quality habitat for native resident and anadromous fish, including threatened coho salmon. Replacement of the two culverts, which are upstream of the Project in the South Fork Rogue River watershed, would provide access to approximately 14.32 miles of year-round habitat for native resident trout in the vicinity of the Project.

Unlike the three dams and two culverts, which are seasonally complete barriers to upstream passage for all life stages of fish, the fish ladder is a potential barrier only to resident trout that are less than 110 mm in length. Water quality, food, and habitat in the bypassed reach are sufficient for fish less than 110 mm, and fish demography and density are consistent both upstream and downstream of the dam, as observed during relicensing studies. Modifying the fish ladder is unlikely to result in a significant increase in the local trout population or healthier fish on either side of the diversion dam.

The settlement agreement activities provide year-round access to an additional 14.32 miles of in-proximity habitat to resident fish and an additional 7.5 miles of habitat to resident and anadromous fish, including threatened coho salmon, within the basin. These normalized 21.82 miles of overall fish habitat benefit are more than 2.5 times greater than the 8.1 miles of normalized fish habitat that would potentially benefit from the contested certification conditions. PacifiCorp's settlement agreement actions have a greater net benefit for fish passage than the contested Certification Conditions of February 7, 2019. Therefore, DEQ's final Certification Conditions of February 6, 2020 do not include modifications of the existing fish passage facilities.

2.3.3 ZOE 3: North Fork Reservoir

See description of North Fork Reservoir in Section 2.1.3. Fish in the reservoir are unimpeded from migrating upstream into the North Fork Rogue River or Middle Fork Canal, which receives water and fish from Red Blanket Creek and Middle Fork Rogue River upstream of their respective diversion dams. Therefore, the effect of this ZOE on upstream fish passage is de minimis.

In addition, on May 9, 2003, PacifiCorp and ODFW entered into a fish passage waiver agreement for the North Fork Dam. In lieu of fish passage at North Fork Dam, PacifiCorp agreed to fund pre-construction monitoring and evaluation, construction, operation, maintenance, and post-construction monitoring and evaluation of fish passage improvements at Butte Mill Dam on Little Butte Creek in Jackson County, Oregon. Butte Mill Dam is the lowermost artificial obstruction in Little Butte Creek and restricted upstream fish passage to approximately 68 miles of productive habitat for native migratory fish including anadromous salmonids. In its net benefit analysis memorandum of April 1, 2003, ODFW concluded that "the fish passage improvements in Little Butte Creek will result in a net benefit to native migratory fish in the Rogue River Basin compared to constructing a fish ladder at North Fork Dam." Fish passage improvements at Butte Mill Dam were completed in 2005.

2.4 CRITERION D - DOWNSTREAM FISH PASSAGE AND PROTECTION

Fish evaluated for this criterion include native, resident rainbow trout and cutthroat trout. There is no anadromy or catadromy in the ZOEs as William L. Jess dam, downstream of the Project, is the furthermost upstream barrier to migration in the Rogue Basin.

Table 9. Downstream fish passage and protection alternative standards matrix

Zone of Effect	*Criterion D Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities			***X***		
ZOE 2: Bypassed Reach	***X***				
ZOE 3: North Fork Reservoir	***X***				

STANDARD D-1. Not Applicable/De Minimis Effect: The facility does not create a barrier to downstream passage, or there are no migratory fish in the vicinity of the facility; if migratory fish were present historically, the facility did not contribute to the extirpation of such species; the facility does not contribute adversely to the sustainability of riverine fish populations or to their access to habitat necessary for the completion of their life cycles; or

STANDARD D-2. Agency Recommendation: The facility is in compliance with a science-based resource agency recommendation for downstream fish passage or fish protection, which may include provisions for appropriate monitoring and effectiveness determinations; or

STANDARD D-3. Best Practice/Best Available Technology: In the absence of science-based resource agency recommendation for downstream fish passage or protection, the facility includes well-designed, well-operated downstream fish passage methods or technologies that are appropriate for the migratory species that occur in the area affected by the facility, and technologies that minimize loss of riverine species. Operating plans for such fish passage technologies must include provisions for ongoing monitoring and effectiveness determinations.

2.4.1 ZOE 1: Project Facilities

The current downstream fish passage facility (i.e., fish screen) was constructed in 1996 to prevent fish from entrainment within the Project waterway and generating unit. This

downstream passage facility consists of a 0.25-inch wedge-wire, inclined plane fish screen with an effective surface area of 193.3 square feet located within the Project waterway. Baffles were installed after the 1998 hydraulic assessment to create a more uniform flow through the screen. In June of 2015, PacifiCorp installed an improved baffle design, which permanently mounted the baffles behind the screen. Fish moving down the intake canal and past the fish screen are directed to an 18-inch diameter bypass pipe that transports them to Pool 6 of the fish ladder, where fish may follow flows downstream through the ladder to the bypassed reach. Flow through the bypass pipe is used to increase attraction flow to the fish ladder.

Physical and biological evaluations of the downstream passage facilities were conducted during relicensing studies (PacifiCorp 2016). The existing facilities meet current state criteria for fish passage (Oregon Department of Fish and Wildlife, 2015) for all measured parameters with the exception of criteria for screen approach velocity. Despite variances from the physical and/or hydraulic criteria, biological evaluation of the existing fish passage facilities demonstrated that these facilities provide effective, safe passage downstream of the dam for resident, native trout. None of the evaluation fish recovered in the downstream bypass return system exhibited signs of injury from the screen, and physical inspection of the screen components, including rubber seals, indicates that the screen forms an effective barrier to entrainment in the Project waterway. Replacements of existing facilities are anticipated to yield limited, incremental benefits compared to the existing facilities and, therefore, are unjustified in light of their estimated cost. FERC concurred with this conclusion in the EA and License, stating that "the existing fish screen prevents trout that are 60 millimeters or greater from entering the powerhouse" and "entrainment losses of trout fry less than 60 millimeters are not significantly affecting trout density in the bypassed reach because the density in the bypassed reach is comparable to that of the unaffected reach of the South Fork upstream of the project."

DEQ's Findings and Evaluation Report states that the current bypass outflow location in the sixth pool of the ladder increases fry mortality and causes delayed or blocked migration with increased associated mortality and reduced productivity. The Report does not identify, and PacifiCorp is not aware of, any evidence of these conditions occurring at the Project. The Report also raises concerns about larger fish feeding on smaller fry as they exit the fish ladder, but moving the fish bypass return pipe outlet from Pool 6 to another location in the river will only relocate any such effects to another location in the river. In addition, the fish bypass flow provides beneficial attraction flows to the ladder, as specified in the ladder's design, which was developed in consultation with ODFW and the U.S. Fish and Wildlife Service. Removing this attraction flow from the ladder may reduce its effectiveness.

Differences between PacifiCorp's proposed Project and the fish passage modifications identified in DEQ's initial Certification Conditions of February 7, 2019 were, in part, resolved by settlement agreement between PacifiCorp and DEQ signed on December 31, 2019. PacifiCorp agreed to complete four actions in lieu of DEQ's proposed flow regime and fish passage modifications. One of the four actions provides downstream fish passage protection through construction and installation of a self-cleaning, rotary drum screen to prevent fish entrainment in an irrigation ditch that diverts flows from Mill Creek into the North Fork Rogue River.

Standard D-3 was selected for this ZOE. The existing facility design and operation are appropriate for the migratory species that occur in the area affected by the facility.

2.4.2 ZOE 2: Bypassed Reach

Fish within the bypassed reach are unrestricted in their downstream migration and may join the North Fork Rogue River at its confluence with the South Fork Rogue River (i.e., upper Lost Creek Reservoir). Therefore, the bypassed reach does not create a barrier to downstream fish passage, and Standard D-1 applies to this ZOE.

2.4.3 ZOE 3: North Fork Reservoir

Fish from the South Fork Rogue River basin are generally screened from the Project waterway (see Section 2.4.1) and, therefore, are not present in the North Fork Reservoir. Therefore, Project effects to downstream fish passage are de minimis in this ZOE, and Standard D-1 applies.

However, fish less than 60 mm and/or fish present in the waterway during screen cleaning cycles may enter the waterway and subsequently enter the North Fork Reservoir, and as such, additional context on the North Fork Reservoir is provided herein.

Fish migrating downstream within North Fork Reservoir encounter one of two potential downstream barriers: North Fork Dam and/or North Fork Canal, both of which are licensed facilities of P-2630. During periods of spill through the North Fork Dam spillgates and/or log chute used to maintain minimum flows in the North Fork Rogue, migratory fish may access the North Fork Rogue River bypassed reach via these routes. North Fork Canal routes flows and fish to the Prospect No. 2 forebay, project flowlines, and one or more of the three project powerhouses, which all ultimately discharge to the North Fork Rogue River upstream of its confluence with the South Fork Rogue.

Pursuant to the FERC relicensing process for P-2630, ODFW and U.S. Fish and Wildlife Service recommended installation, operation, and maintenance of fish screens at North Fork Dam. In the license for P-2630 (FERC 2008), FERC determined that the construction, operation, and maintenance of fish screens were not justified in light of "(1) the low value of the fishery in terms of the average size of the trout; (2) the light fishing pressure in the project area; (3) the small passage benefits of providing fishways and fish screens; and (4) the adverse effects of the costs involved on project economics."

2.5 CRITERION E – SHORELINE AND WATERSHED PROTECTION

Table 10. Shoreline and watershed protection alternative standards matrix

Zone of Effect	*Criterion E Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities		***X***			
ZOE 2: Bypassed Reach		***X***			
ZOE 3: North Fork Reservoir	***X***				

STANDARD E-1. Not Applicable/De Minimis Effect: There are no lands associated with the facility where the facility owner has direct or indirect ownership or control over lands surrounding the facility and its riverine zones that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and the facility is not subject to any Shoreline Management Plan (SMP) or similar protection plan; or

STANDARD E-2. Agency Recommendations: The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.

2.5.1 ZOE 1: Project Facilities

The approximately one-acre Project impoundment and the South Fork Rogue watershed upstream of the Project are located on federal lands administered by the U.S. Forest Service. There are no known existing erosive conditions, mass soil movement, slumping, or other unstable conditions associated with Project impoundment shorelines and stream banks. There are no shoreline buffer zones, shoreline management plans, aesthetics management plans, or developed recreation facilities associated with the Project. The Project waterway downstream of the impoundment does not exhibit any native-surface shorelines. The Project is subject to a Vegetation Management Plan (VMP) developed to promote the establishment and maintenance of native plant communities and to minimize the spread of noxious weed species within the Project boundary. License Article 411 approved and made part of the license the VMP filed on December 30, 2016 as Appendix C of Final License Application Exhibit E. The Sediment and Dredging Plan required by License Article 406 is expected to be filed with FERC by December 31, 2022. The Sediment and Dredging Plan will address dredging of the impoundment and placing the dredged material along the bypassed reach stream bank for the purpose of enhancing downstream trout spawning habitat. The Wildlife Crossing Plan required by License Article 412 is expected to be filed with FERC by September 27, 2021. Therefore, the Project will comply with agency recommendations associated with the identified management plans prepared, in part, for the protection of shoreline and watershed resources in ZOE 1, and Criterion E-2 applies.

2.5.2 ZOE 2: Project Bypassed Reach

The shorelines of the Project bypassed reach are on federally-owned lands administered by the U.S. Forest Service and Bureau of Land Management and private timber lands outside of PacifiCorp ownership. There are no known existing erosive conditions, mass soil movement, slumping, or other unstable conditions associated with bypassed reach shorelines and stream banks. Project effects on bypassed reach shorelines are limited by the operational ramping rate of 0.2 feet per hour required by Certification Condition IV.f. The Sediment and Dredging Plan required by License Article 406 is expected to be filed with FERC by December 31, 2022. The Sediment and Dredging Plan will address dredging of the impoundment and placing the dredged material along the bypassed reach stream bank for the purpose of enhancing downstream trout spawning habitat. Therefore, the Project will comply with agency recommendations associated with the identified management plans prepared, in part, for the protection of shoreline and watershed resources in ZOE 2, and Criterion E-2 applies.

2.5.3 ZOE 3: North Fork Reservoir

The shoreline of North Fork Reservoir within the ZOE is on PacifiCorp-owned property. There are no known existing erosive conditions, mass soil movement, slumping, or other unstable conditions associated with North Fork Reservoir shorelines and stream banks. There are no shoreline buffer zones, shoreline management plans, or aesthetics management plans associated with the Project. Article 412 of the FERC license for P-2630 required a plan to enhance recreation resources at North Fork Park, which is immediately adjacent to the ZOE on the northeast bank of the reservoir. The plan included provisions for a group picnic area, a barrier-free picnic area, a barrier-free interpretive trail from North Fork Park to the Rogue River-Siskiyou National Forest boundary to the north, a barrier-free single vault restroom, an information kiosk, and directional signs. FERC approved the recreation plan and the as-built drawings of the park enhancements on June 1, 2009 and April 21, 2010, respectively. Therefore, the Project exhibits a de minimis effect on shoreline and watershed resources in ZOE 3 and Criterion E-1 applies.

2.6 CRITERION F - THREATENED AND ENDANGERED SPECIES PROTECTION

Table 11. Threatened and endangered species protection alternative standards matrix

Zone of Effect	*Criterion F Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities		***X***			
ZOE 2: Bypassed Reach		***X***			
ZOE 3: North Fork Reservoir		***X***			

STANDARD F-2. ***Finding of No Negative Effect***: There are listed species in the area, but the facility has been found by an appropriate resource management agency to have no negative effect on them, or habitat for the species does not exist within the project's affected area or is not impacted by facility operations.

2.6.1 ZOE 1: Project Facilities

Two federally-listed animal species potentially occur near the Project: the endangered gray wolf (*Canis lupus*) and the threatened northern spotted owl (*Strix occidentalis caurina*). Gray wolves have been observed within the Project boundary. Critical habitat is also designated for northern spotted owl near, but outside of, the Project boundary. No state-listed animal species occur within the Project boundary. No federally-listed threatened or endangered plant species are known to occur within the Project boundary. Two state-listed plant species, Umpqua mariposa lily (*Calochortus umpquaensis*) and wayside aster (*Eucephalus vialis*), potentially occur in the Project boundary, but these plant species were not identified during botanical surveys conducted during relicensing. FLA Section E.6.7 provides additional detail on species review, survey, and analysis of potential effects on listed species.

In the Project EA (2018), FERC concluded that "continued project operation and maintenance…would not affect the endangered gray wolf because wolf use of the project area is transitory and infrequent." FERC also concluded that "continued project operation and

maintenance would have no effect on the threatened northern spotted owl because no occupied spotted owl habitat occurs in the project area" and "vegetation clearing and construction activities would occur outside designated critical habitat for the spotted owl which is located 400 feet from the project boundary," thereby having no effect on critical habitat.

There are listed species and critical habitat in the area, but the facility has been found by FERC to have no negative effect on them. Therefore, Standard F-2 applies to this ZOE.

2.6.2 ZOE 2: Bypassed Reach

There are listed species and critical habitat in the area, but the facility has been found by FERC to have no negative effect on them (see Section 2.6.1). Therefore, Standard F-2 applies to this ZOE.

2.6.3 ZOE 3: North Fork Reservoir

In the Project EA (2006) for P-2630, of which North Fork Reservoir is a licensed facility, FERC concluded that there were no unavoidable adverse effects of the Project. For the two species listed in the Project vicinity at the time of analysis, bald eagle (*Haliaeetus leucocephalus*) and northern spotted owl, FERC determined that the project may affect, but is not likely to adversely affect either species. There are no other listed species in ZOE 3, and therefore, Standard F-2 applies to this ZOE.

2.7 CRITERION G - CULTURAL AND HISTORIC RESOURCE PROTECTION

Table 12. Cultural and historic resource protection alternative standards matrix

Zone of Effect	*Criterion G Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities		***X***			
ZOE 2: Bypassed Reach	***X***				
ZOE 3: North Fork Reservoir		***X***			

STANDARD G-1. Not Applicable/De Minimis Effect: There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not adversely affected those that are or were historically present; or

STANDARD G-2. Approved Plan: The facility is in compliance with approved state, federal, and recognized tribal plans for protection, enhancement, or mitigation of impacts to cultural or historic resources affected by the facility.

2.7.1 ZOE 1: Project Facilities

PacifiCorp performed cultural resource surveys (PacifiCorp 2016) within the Project boundary during relicensing, and cultural and historic resources were found within the boundary. Project facilities are contributing elements to the overall Prospect Hydroelectric Project Historic District, which the Oregon State Historic Preservation Office (SHPO) concurs is eligible for listing in the National Register of Historic Places (NRHP) (State Historic Preservation Office, 2016). License Article 415 requires PacifiCorp to implement the "Programmatic Agreement Between the Federal Energy Regulatory Commission and the Oregon Historic Preservation Officer for Managing Historic Properties that May be Affected by Issuance of a License to PacifiCorp for the Continued Operation of the Prospect No. 3 Hydroelectric Project in Jackson County, Oregon (FERC No. 2337-077)" (PA) executed on December 22, 2018. The PA, License Article 415, and Forest Service 4(e) Condition 10 require revision of the Project Historic Properties Management Plan (HPMP), of which a version was submitted with the FLA, and filing the revised HPMP with FERC within six months of the effective date of the License. PacifiCorp must prepare the revised HPMP in consultation with SHPO, Forest Service, and Cow Creek Band of Umpqua Tribe of Indians and provide a minimum of 30 days for the agencies to comment and make recommendations. The revised HPMP is out for agency review as of the date of this recertification application. Therefore, Standard G-2 applies to this ZOE.

2.7.2 ZOE 2: Bypassed Reach

There are no known cultural or historic resources in the bypassed reach. Project operation and maintenance are unlikely to affect any unknown resources in the bypassed reach. Therefore, this standard is not applicable in ZOE 2, and Standard G-1 applies to this zone.

2.7.3 ZOE 3: North Fork Reservoir

North Fork Reservoir is not designated as a contributing element of the Prospect Hydroelectric Project Historic District (see Section 2.7.1). However, the reservoir is a licensed facility of P-2630 and is subject to the approved HPMP (PacifiCorp, 2005) for that project. Therefore, Standard G-2 applies to this ZOE.

2.8 CRITERION H - RECREATIONAL RESOURCES

Table 13. Recreational resources alternative standards matrix

Zone of Effect	*Criterion H Alternative Standards*				
	1	***2***	***3***	***4***	***Plus***
ZOE 1: Project Facilities			***X***		
ZOE 2: Bypassed Reach			***X***		
ZOE 3: North Fork Reservoir		***X***			

STANDARD H-2. Agency Recommendations: The facility demonstrates compliance with resource agency recommendations for recreational access or accommodation (including recreational flow releases), or any enforceable recreation plan in place for the facility; or

STANDARD H-3. Assured Accessibility and Use: If agency recommendations or an enforceable recreation plan is not in effect, the applicant demonstrates that they have been and formally commits as a condition of its LIHI Certification to continue to be responsive to reasonable requests from recreational interests for public access to lands and waters associated with the facility and to appropriate recreational water flows and levels, without fees or charges.

2.8.1 ZOE 1: Project Facilities[6]

There are no developed recreational facilities at the project and private land in the lower portion of the Project limits public access. Because of the limited recreational use at the Project, and no expectation of future increases in use, on March 3, 2010, FERC exempted PacifiCorp from the requirement to file Form 80 recreation use reports.

The Rogue River-Siskiyou National Forest lands surrounding the upper portion of the Project provide opportunities for various recreational uses including hunting, fishing, camping, hiking, birdwatching and picnicking, but such use is light within the Project boundary. Hunting is the primary recreational activity that occurs near the Project. The South Fork Rogue River Trail is traverses a bluff above the Project impoundment at the confluence of Imnaha Creek and the South Fork.

A specific license requirement allowing free public access to project lands and waters for outdoor recreation purposes is not necessary because any license issued for the project would include a standard license requirement that provides for free public access except where necessary to protect life, health, and property. Therefore, Standard H-3 applies to this ZOE.

2.8.2 ZOE 2: Bypassed Reach[7]

Between May 2014 and May 2015, PacifiCorp conducted a whitewater boating study of a 7-mile-long stretch of the South Fork from Butte Falls Prospect Bridge to the confluence of the North and South Forks in order to determine boating use and demand on the South Fork and the feasibility of providing flows for whitewater boating. Boater flow preferences were also obtained through a focus group meeting and a questionnaire survey of experienced boaters (PacifiCorp 2015). Use information derived from the study showed that under current project operations, the recreational boating season on the South Fork extends from approximately April 29 to May 29. Questionnaire responses showed that a small majority of boaters favored 200 cfs as the lowest acceptable flow for running the reach and 350 cfs as an optimal flow. The lowest identified minimum flow was 150 cfs with the highest optimum suggested flow being 400 cfs. Respondents reported the need for frequent portages due to numerous rocks and wood obstacles in the river preventing passage in certain areas. Study results also showed that there are no safe or readily accessible put-in or take-out locations downstream of the Butte Falls Prospect Road Bridge due to private property ownership and the steep topography of the South Fork Canyon.

Under proposed operations, there would be no change in recreation opportunities including whitewater boating flows. Flows of 350 cfs, considered optimal by whitewater kayakers for

[6] Partially excerpted from FERC's EA (2018)

[7] Partially excerpted from FERC's EA (2018)

running the bypassed reach, would continue to be unavailable and flows of at least 200 cfs, the minimally acceptable flow for kayaking the project reach, would continue to be available for one month in the spring (generally between April 29 and May 29). Other than the occasional use of the bypassed reach by a few skilled whitewater boaters, recreational use of the Project area remains limited, amounting to less than 40 estimated users per year. Numerous whitewater boating opportunities on the nearby North Fork Rogue River appear to be meeting existing needs. Because recreation at the Project is low and is expected to remain low for the foreseeable future FERC did not recommend any recreation enhancements. Continuing to provide for the operation and maintenance of the USGS stream gage to monitor minimum flows will benefit the few paddlers that may use the bypassed reach by providing real-time flow information. Therefore, Standard H-3 applies to this ZOE.

2.8.3 ZOE 3: North Fork Reservoir

Article 412 of the FERC license for P-2630 required a plan to enhance recreation resources at North Fork Park, which is immediately adjacent to the ZOE on the northeast bank of the reservoir. The plan included provisions for a group picnic area, a barrier-free picnic area, a barrier-free interpretive trail from North Fork Park to the Rogue River-Siskiyou National Forest boundary to the north, a barrier-free single vault restroom, an information kiosk, and directional signs. FERC approved the recreation plan and the as-built drawings of the park enhancements on June 1, 2009 and April 21, 2010, respectively. The facility demonstrates compliance with the recreation plan, and therefore, Standard H-2 applies to this ZOE.

3.0 SWORN STATEMENT AND WAIVER

As an Authorized Representative of PacifiCorp, the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's certification program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The Undersigned further acknowledges that if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified®.

The Undersigned further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's certification program.

Company Name: PacifiCorp

Authorized Representative:

Name: Mark Sturtevant

Title: Vice President, Renewable Resources

Authorized Signature: Mark Sturtevant

Date: 2/17/2020

4.0 CONTACTS

Table 14. Applicant-related contacts

Facility Owner:	
Name and Title	Mark Sturtevant, Vice President, Renewable Resources
Company	PacifiCorp
Phone	503-813-6680
Email Address	mark.sturtevant@pacificorp.com
Mailing Address	825 NE Multnomah St., Suite 1800, Portland, OR 97232
Facility Operator (if different from Owner):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Steve Albertelli, License Program Manager
Company	PacifiCorp
Phone	541-776-6676
Email Address	steve.albertelli@pacificorp.com
Mailing Address	925 S. Grape St., Bldg. 5, Medford, OR 97501
Party responsible for accounts payable:	
Name and Title	Jessica Zahnow, Renewable Resource & Environmental Policy Specialist
Company	PacifiCorp
Phone	503-813-6052
Email Address	jessica.zahnow@pacificorp.com
Mailing Address	825 NE Multnomah St., Suite 2000, Portland, OR 97232

Table 15. Current and relevant state, federal, and tribal resource agency contacts with knowledge of the facility

Agency Contact (Check areas of responsibility: Flows X, Water Quality X, Fish/Wildlife X Resources X, Watersheds X, T/E Spp. X, Cultural/Historic Resources X, Recreation X):	
Agency Name	US Forest Service
Name and Title	Eric Burke, Natural Resources Staff Officer
Phone	541-618-2050
Email address	eric.burke@usda.gov
Mailing Address	3040 Biddle Road, Medford, OR 97504
Agency Contact (Check areas of responsibility: Flows__, Water Quality __, Fish/Wildlife X Resources __, Watersheds __, T/E Spp. X, Cultural/Historic Resources __, Recreation __):	
Agency Name	US Fish and Wildlife Service
Name and Title	Jim Thrailkill, Field Supervisor
Phone	541-957-3470
Email address	jim_thrailkill@fws.gov
Mailing Address	777 Garden Valley Blvd, Roseburg, OR 97471
Agency Contact (Check areas of responsibility: Flows X, Water Quality __, Fish/Wildlife X Resources __, Watersheds X, T/E Spp. X, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Department of Fish and Wildlife
Name and Title	Jason Brandt, SW Hydropower Program Coordinator
Phone	541-464-2182
Email address	jason.r.brandt@state.or.us
Mailing Address	4192 North Umpqua Highway, Roseburg, OR 97470
Agency Contact (Check areas of responsibility: Flows X, Water Quality X, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Department of Environmental Quality
Name and Title	Marilyn Fonseca, 401 Hydropower Program Coordinator
Phone	503-22-6804
Email address	fonseca.marilyn@deq.state.or.us
Mailing Address	700 NE Multnomah St., Ste. 600, Portland, OR 97232
Agency Contact (Check areas of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources X, Recreation __):	
Agency Name	Oregon State Historic Preservation Office
Name and Title	Jamie French, Archaeologist
Phone	503-986-0729
Email address	jamie.french@oregon.gov
Mailing Address	725 Summer St. NE, Salem, OR 97301

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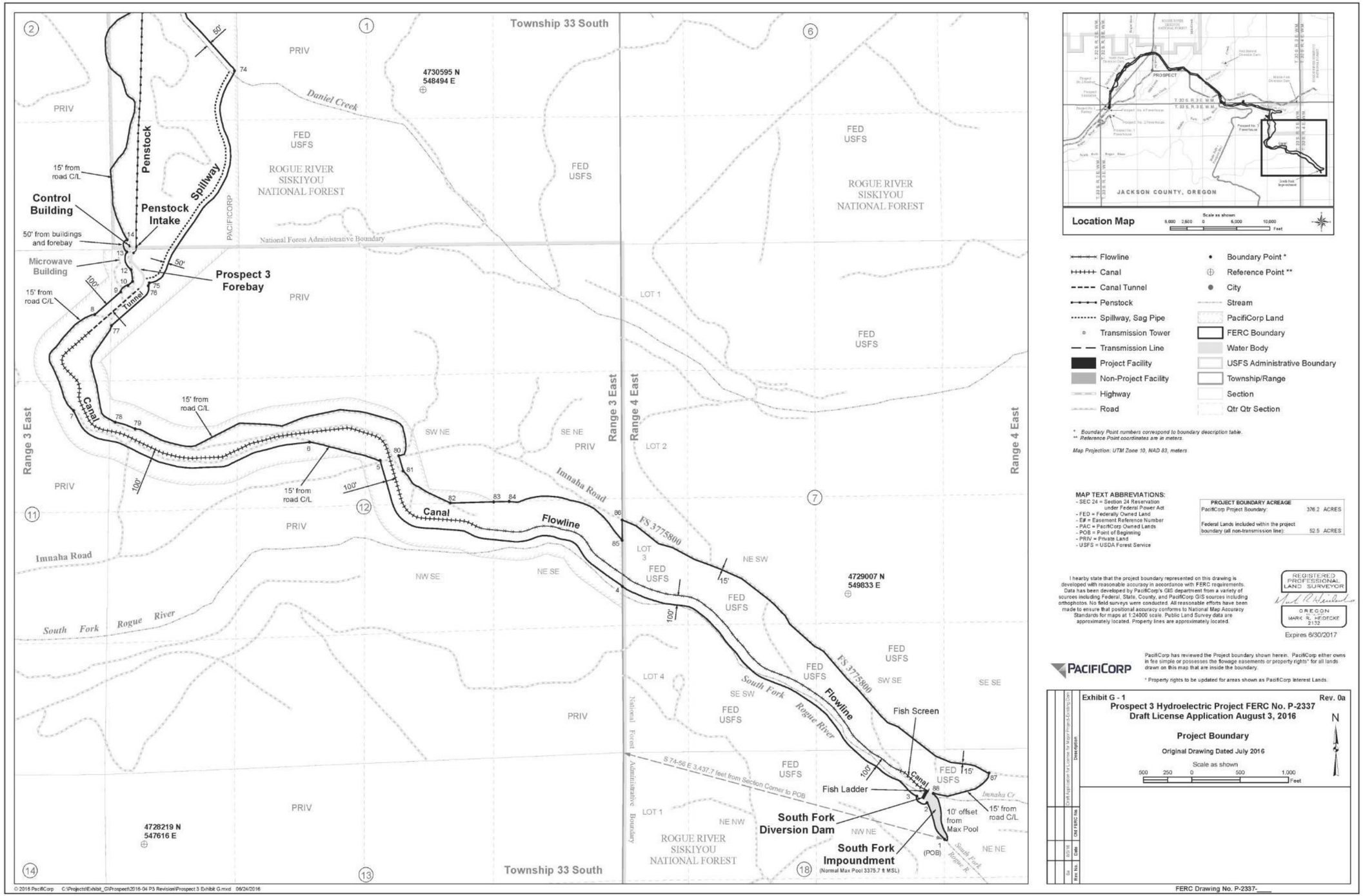
APPENDIX A: PROJECT MAPS



- Flowline
- Canal
- Canal Tunnel
- Penstock
- Spillway, Sag Pipe
- Transmission Tower
- Transmission Line
- Project Facility
- Non-Project Facility
- Highway
- Road
- Boundary Point *
- Reference Point **
- City
- Stream
- PacifiCorp Land
- FERC Boundary
- Water Body
- USFS Administrative Boundary
- Township/Range
- Section
- Qtr Qtr Section

* Boundary Point numbers correspond to boundary description table.
** Reference Point coordinates are in meters.

Map Projection: UTM Zone 10, NAD 83, meters

MAP TEXT ABBREVIATIONS:
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PROJECT BOUNDARY ACREAGE	
PacifiCorp Project Boundary:	376.2 ACRES
Federal Lands included within the project boundary (all non-transmission line):	52.5 ACRES

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REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
MARK R. HEDECKE
2122
Expires 6/30/2017

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Exhibit G - 1 Rev. 0a

Prospect 3 Hydroelectric Project FERC No. P-2337
Draft License Application August 3, 2016

Project Boundary

Original Drawing Dated July 2016

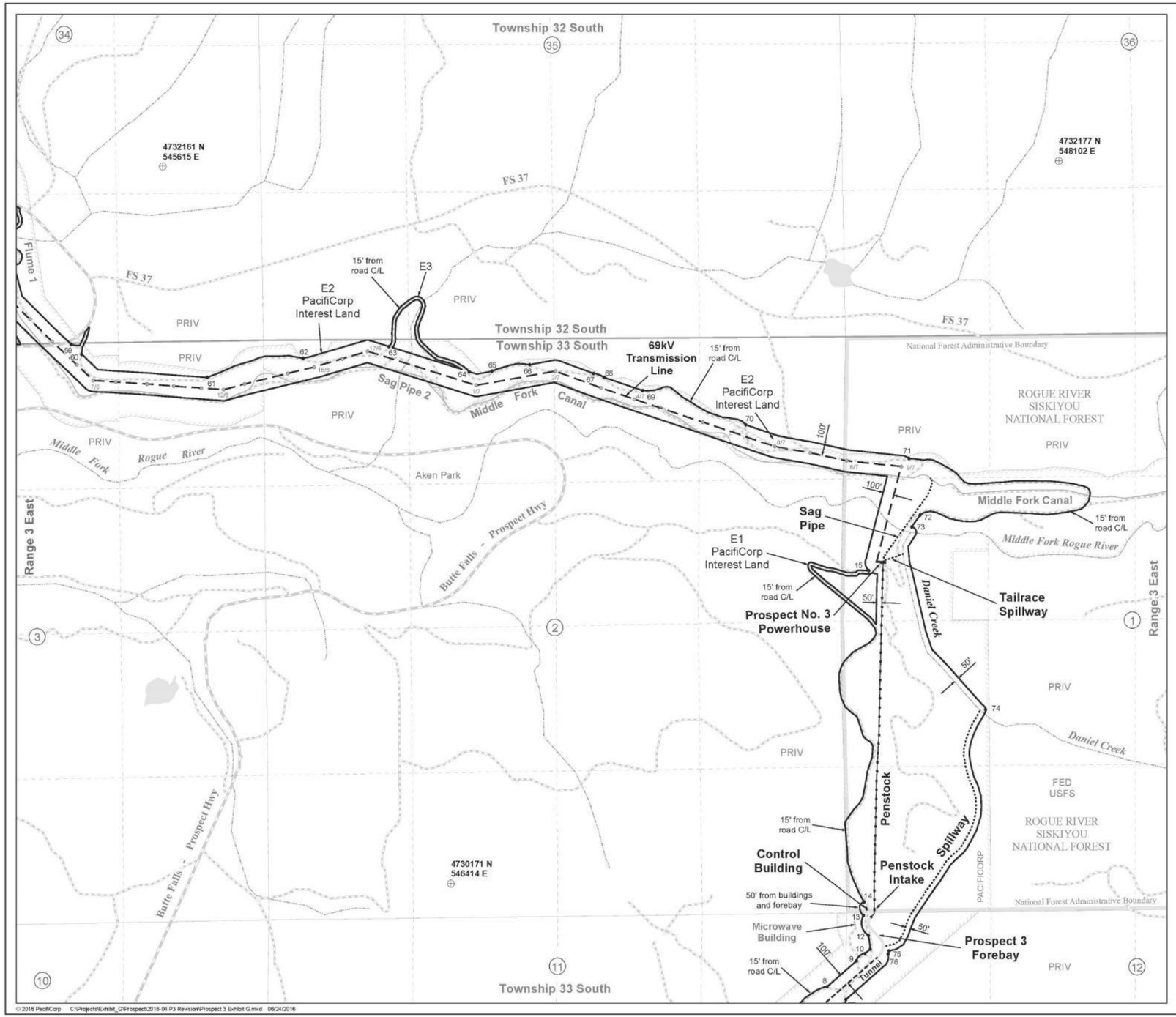
Scale as shown

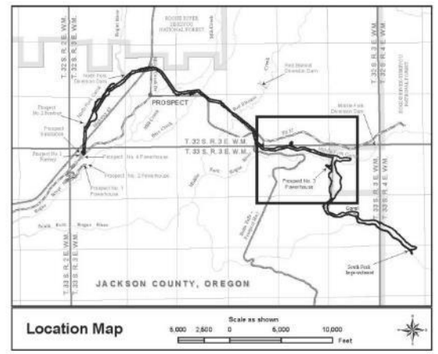
500 250 0 500 1,000 Feet

N

Rev No.	Date	Old FERC No.	Description
0a	8/2016		Draft Application for License for Major Project-Existing Dam

FERC Drawing No. P-2337-___





Flowline
Canal
Canal Tunnel
Penstock
Spillway, Sag Pipe
Transmission Tower
Transmission Line
Project Facility
Non-Project Facility
Highway
Road

Boundary Point *
Reference Point **
City
Stream
PacifiCorp Land
FERC Boundary
Water Body
USFS Administrative Boundary
Township/Range
Section
Qtr Qtr Section

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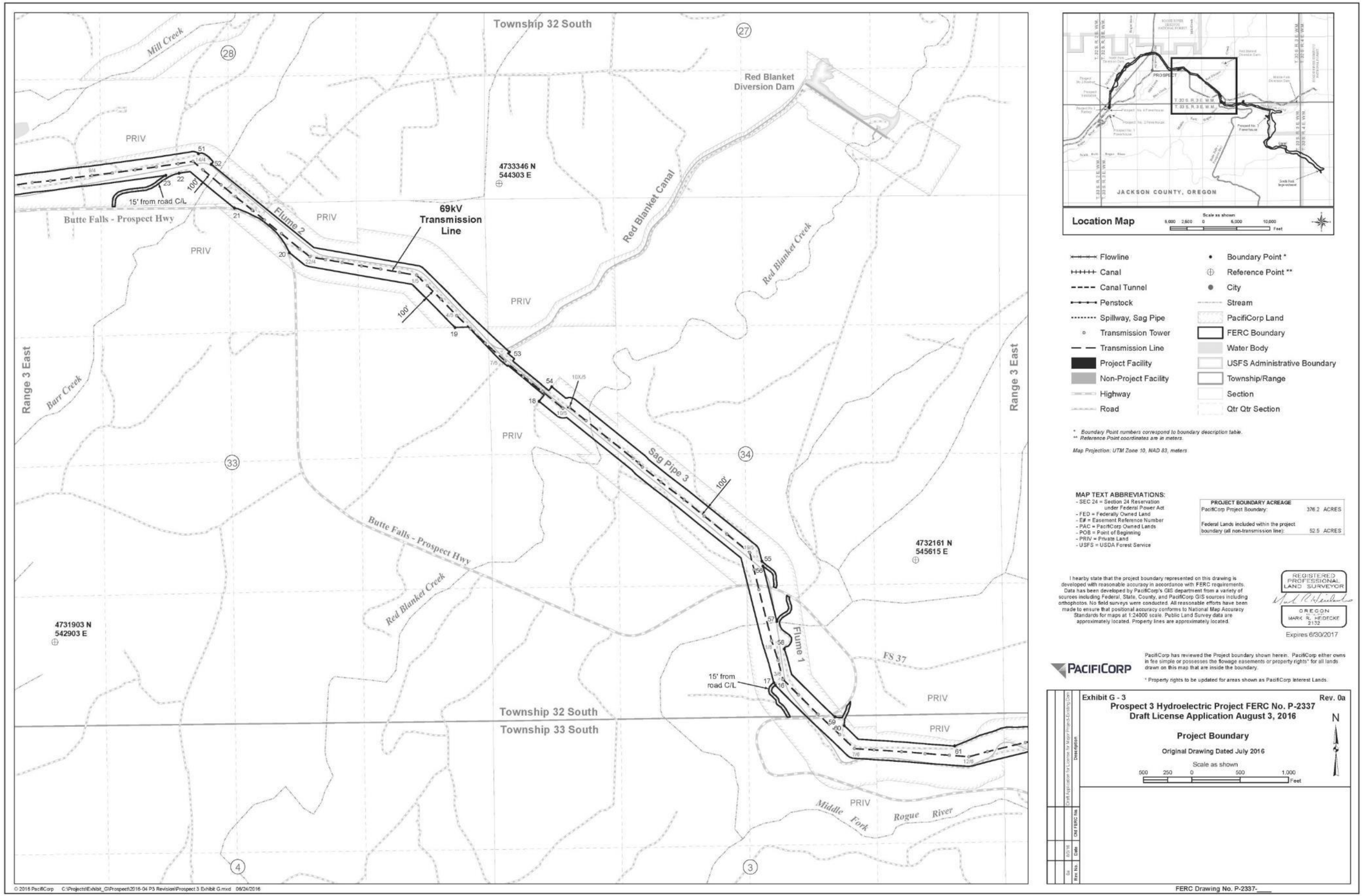
No.	Date	Old FERC No.	Description
Rev. Nos.	8/01/16		Draft Application for License for Major Project-Existing Dam

FERC Drawing No. P-2337-___


Township 32 South
Township 33 South
Range 3 East
Mill Creek
Barr Creek
Red Blanket Canal
Red Blanket Creek
Red Blanket Diversion Dam
Butte Falls - Prospect Hwy
Flume 2
Flume 1
Sag Pipe 3
69kV Transmission Line
15' from road C/L
4733346 N
544303 E
4732161 N
545615 E
4731903 N
542903 E
PRIV
FS 37
Middle Fork Rogue River
JACKSON COUNTY, OREGON
Location Map
Flowline
Canal
Canal Tunnel
Penstock
Spillway, Sag Pipe
Transmission Tower
Transmission Line
Project Facility
Non-Project Facility
Highway
Road
Boundary Point *
Reference Point **
City
Stream
PacifiCorp Land
FERC Boundary
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Rev. 0a
Prospect 3 Hydroelectric Project FERC No. P-2337
Draft License Application August 3, 2016
Project Boundary
Original Drawing Dated July 2016
Scale as shown
FERC Drawing No. P-2337-___
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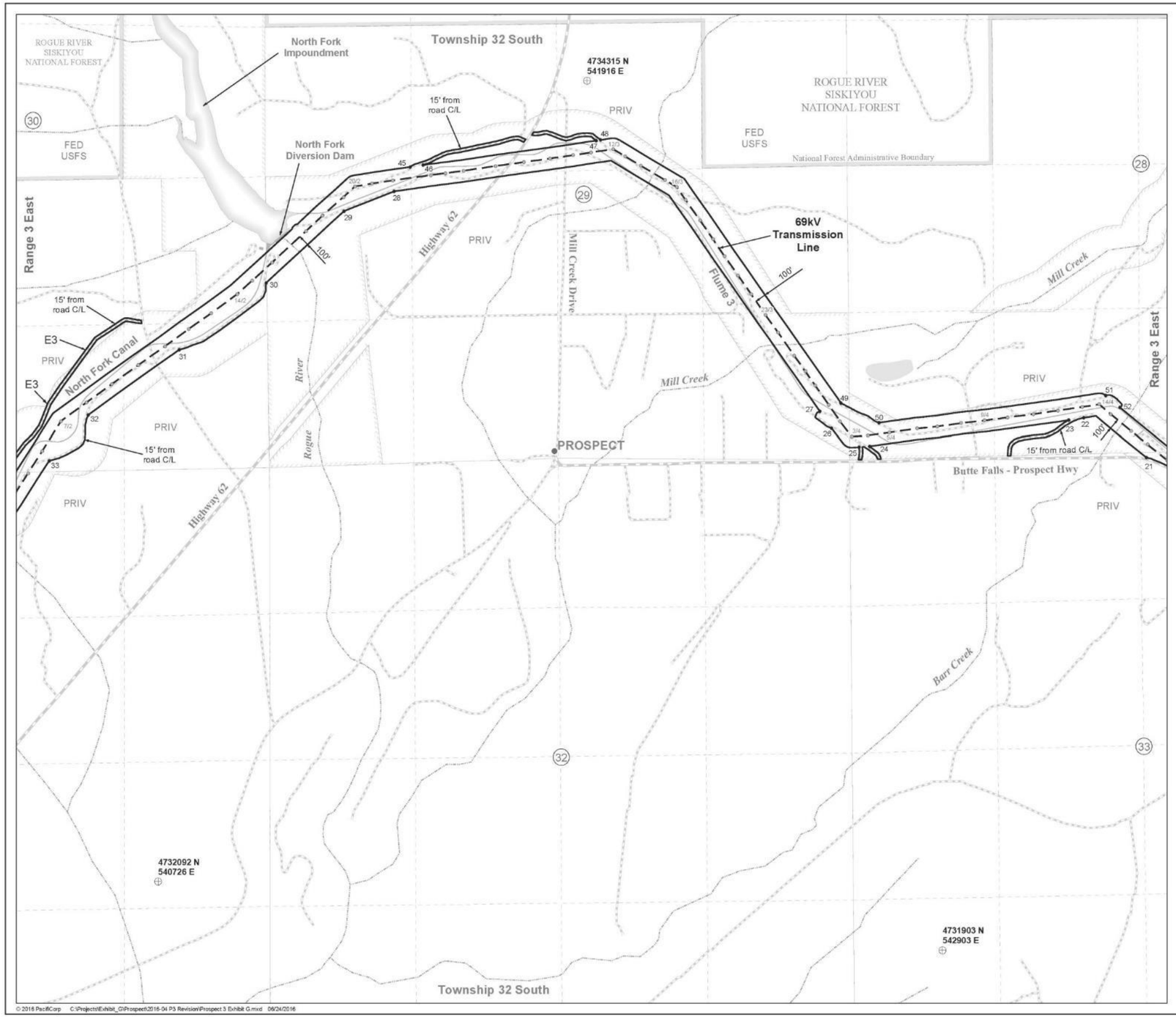

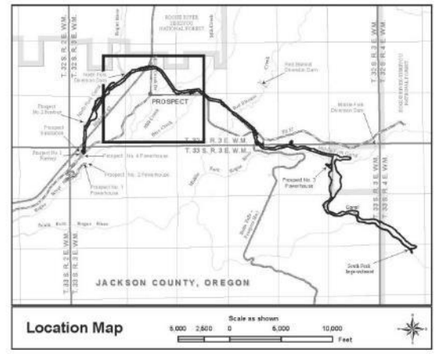

- Flowline
- Canal
- Canal Tunnel
- Penstock
- Spillway, Sag Pipe
- Transmission Tower
- Transmission Line
- Project Facility
- Non-Project Facility
- Highway
- Road
- Boundary Point *
- Reference Point **
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Draft License Application August 3, 2016

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500 250 0 500 1,000 Feet

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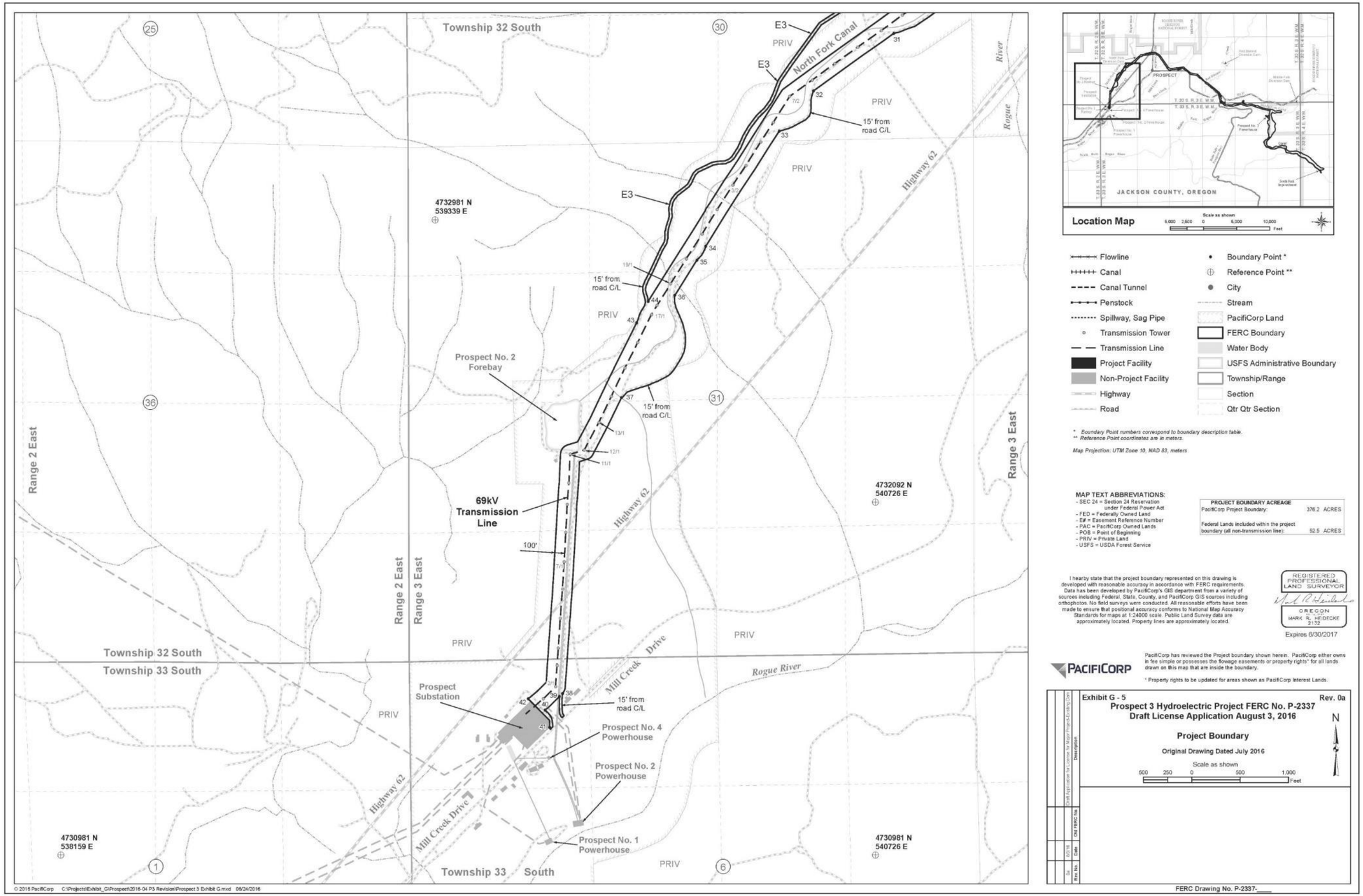
FERC Drawing No. P-2337-___


Township 32 South
Township 33 South
Township 33 South
Range 2 East
Range 3 East
North Fork Canal
Rogue River
Highway 62
Mill Creek Drive
E3
PRIV
15' from road C/L
4732981 N
539339 E
Prospect No. 2 Forebay
69kV Transmission Line
100'
Prospect Substation
Prospect No. 4 Powerhouse
Prospect No. 2 Powerhouse
Prospect No. 1 Powerhouse
4732092 N
540726 E
4730981 N
538159 E
4730981 N
540726 E
PROSPECT
JACKSON COUNTY, OREGON
Location Map
Flowline
Canal
Canal Tunnel
Penstock
Spillway, Sag Pipe
Transmission Tower
Transmission Line
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500 250 0 500 1,000 Feet
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Old FERC No.
Date
Rev. No.
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APPENDIX B: PROJECT PHOTOS

**(September 2012
unless noted)**

Photo 1. Looking upstream at the dam spillway and intake structure (left) from the South Fork Rogue bypass reach.

Photo 2. Looking downstream at the impoundment, dam spillway, and intake structure from the South Fork Rogue trail. (May 2013)

Photo 3. Looking upstream at the dam impoundment and South Fork Rogue. Imnaha Creek is tributary to the South Fork at the left of the photo.

Photo 4. View of the fish ladder and canal from the intake structure. The fish screen return pipe is visible at the fish ladder switchback, emptying into Pool 6.

Photo 5. View of (L-R) the intake structure, fish ladder entrance and dam spillway.

Photo 6. View of the intake structure and upper pools of the fish ladder.

Photo 7. Looking upstream at the fish screen facilities. The fish return pipe is visible in the lower foreground.

Photo 8. Looking upstream at the fish screen.

Photo 9. The beginning of the 66" diameter woodstave pipeline.

Photo 10. Typical woodstave pipeline section adjacent to the South Fork Rogue canyon (left).

Photo 11. USGS gage (14332000) on the southwest bank of the South Fork Rogue approximately 1,500 feet downstream of the diversion dam.

Photo 12. Looking downstream at a typical section of the bypassed reach of the South Fork Rogue.

Photo 13. Looking downstream at the bypassed reach of the South Fork Rogue from the Prospect-Butte Falls Highway bridge. (May 2013)

Photo 14. Transition from the woodstave pipeline to concrete-lined canal.

Photo 15. Typical concrete-lined canal segment.

Photo 16. Looking upstream at the tunnel outlet to the canal and side-channel spillway (left).

Photo 17. The canal forebay and penstock intake structure.

Photo 18. View of the upper penstock segments.

Photo 19. View of the lower penstock alignment with the powerhouse in the background.

Photo 20. Project powerhouse and substation.

Photo 21. View of the 7,200 kW generating unit inside the powerhouse.

Photo 22. The powerhouse tailrace structure.

Photo 23. View of the tailrace spillway from the tailrace gantry.

Photo 24. View looking southwest at the sag-pipe alignment with the powerhouse in the background. (October 2019)

Photo 25. View looking northeast at the sag-pipe alignment and rise to Middle Fork Canal. (October 2019)

Photo 26. Looking upstream (east) at Project Water discharge from the sag-pipe (right) to the Middle Fork Canal (left). (October 2019)

Photo 27. Looking southeast at Middle Fork Canal (left) discharge to North Fork Reservoir upstream of North Fork Dam (right). (October 2019)

Photo 28. Looking northwest at discharge of Middle Fork Canal to North Fork Reservoir with North Fork Park visible on right of frame. (October 2019)