

ENVIRONMENTAL ASSESSMENT
FOR HYDROPOWER LICENSE

Rock Creek Hydroelectric Project—FERC Project No. 12726-002

Oregon

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, NE
Washington, D.C. 20426

July 2020

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ACRONYMS AND ABBREVIATIONS

7DAM	7-Day Average Maximum
ac-ft	acre-feet
Advisory Council	Advisory Council on Historic Preservation
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
Applicant	Warm Springs Hydro, LLC
B.P.	Before Present
°C	degrees Celsius
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
D2SI	Division of Dam Safety and Inspections
dbh	diameter-at-breast-height
DO	dissolved oxygen
DPS	distinct population segment
EA	Environmental Assessment
ECP	Erosion Control Plan
eDNA	environmental DNA
EOLP	Eastern Oregon Lights and Power
ESA	Endangered Species Act
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FLA	final license application
Forest Service	U.S. Department of Agriculture, U.S. Forest Service
FPA	Federal Power Act
FWS	U.S. Department of the Interior, U.S. Fish and Wildlife Service
gpm	gallons per minute
GPS	Global Positioning System
HPMP	Historic Properties Management Plan
HSI	habitat suitability index
IFIM	Instream Flow Incremental Method
IPaC	Information, Planning, and Conservation System
kV	kilovolt
mg/L	milligrams per Liter
MW	megawatt
MWh	megawatt-hour
NAGPRA	Native Graves Protection and Repatriation Act of 1992
National Register	National Register of Historic Places
NERC	North American Electric Reliability Corporation

NHPA	National Historic Preservation Act of 1966
NWPP	Northwest Power Pool
Oregon DEQ	Oregon Department of Environmental Quality
Oregon DFW	Oregon Department of Fish and Wildlife
Oregon WRD	Oregon Water Resources Department
OTEC	Oregon Trail Electric Co-Op
PCE	primary constituent elements
PURPA	Public Utility Regulatory Policies Act of 1978
ROW	right-of-way
SHPO	State Historic Preservation Officer
TCP	traditional cultural property
TDS	total dissolved solids
TMDL	Total Maximum Daily Load
TWRMP	Terrestrial Wildlife Resource Management Plan
USGS	U.S. Geological Survey
Warm Springs	Warm Springs Hydro, LLC (applicant)
WaterWatch	WaterWatch of Oregon
WQC	water quality certification
WQPP	water quality protection plan

ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission
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Division of Hydropower Licensing
Washington, D.C.

Rock Creek Hydroelectric Project FERC Project No. 12726-002 – Oregon

1.0 INTRODUCTION

1.1 APPLICATION

On April 1, 2019, Warm Springs Hydro, LLC (Warm Springs or applicant) filed an application for an original license to construct, operate, and maintain the proposed 850-kilowatt (kW) Rock Creek Hydroelectric Project (Rock Creek Project) No. 12726. The project would generate an estimated 3,900 megawatt-hours (MWh) of energy annually. The project would be located on Rock Creek in Baker County, Oregon (figure 1). The project would occupy 1.8 acres of federal land managed by the U.S. Forest Service (Forest Service) in the Wallowa-Whitman National Forest.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the proposed Rock Creek Project is to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a license to Warm Springs for the project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, or water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

Issuing a license for the project would allow Warm Springs to generate electricity at the project for the term of the license, making electric power available from a renewable resource.

This environmental assessment (EA) evaluates the effects associated with constructing and operating the project, alternatives to the project, and makes recommendations on whether to issue an original license, and if so, includes recommended terms and conditions to become a part of any license issued.

In the EA, we assess the effects of constructing and operating the project: (1) as proposed by Warm Springs, (2) Warm Springs' proposal as modified by staff (staff alternative), and (3) staff alternative with mandatory conditions. We also consider the effects of taking no action (no-action alternative), in which the project would not be licensed or constructed. Environmental issues that are addressed include construction and operation effects on aquatic and terrestrial resources.

1.2.2 Need for Power

The North American Electric Reliability Corporation (NERC) annually forecasts electrical supply and demand nationally and regionally for a 10-year period. The Rock Creek Project would be located within the jurisdiction of the Northwest Power Pool (NWPP), a sub-region of the Western Electricity Coordinating Council, a region of the NERC. According to NERC's 2019 forecast, average annual demand requirements for the NWPP sub-region are projected to grow at an average rate of 1.5 percent from 2019 through 2028. NERC projects that resource capacity margins (generating capacity in excess of demand) would range between 21.8 percent and 23.4 percent of firm peak demand during the 10-year forecast period, including estimated new capacity additions.

Therefore, the Rock Creek Project could help meet part of the future load requirements.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

Any license for the proposed project would be subject to the requirements of the FPA and other applicable statutes, as summarized below.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission is to require the construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretary of the U.S Department of Commerce or the Secretary of the U.S. Department of the Interior. No fishway prescriptions have been filed for the project under section 18 of the FPA. The U.S. Fish and Wildlife Service (FWS), by filing dated November 12, 2019, requests a reservation of authority to prescribe fishways under section 18 of the FPA to be included in any license issued for the project.

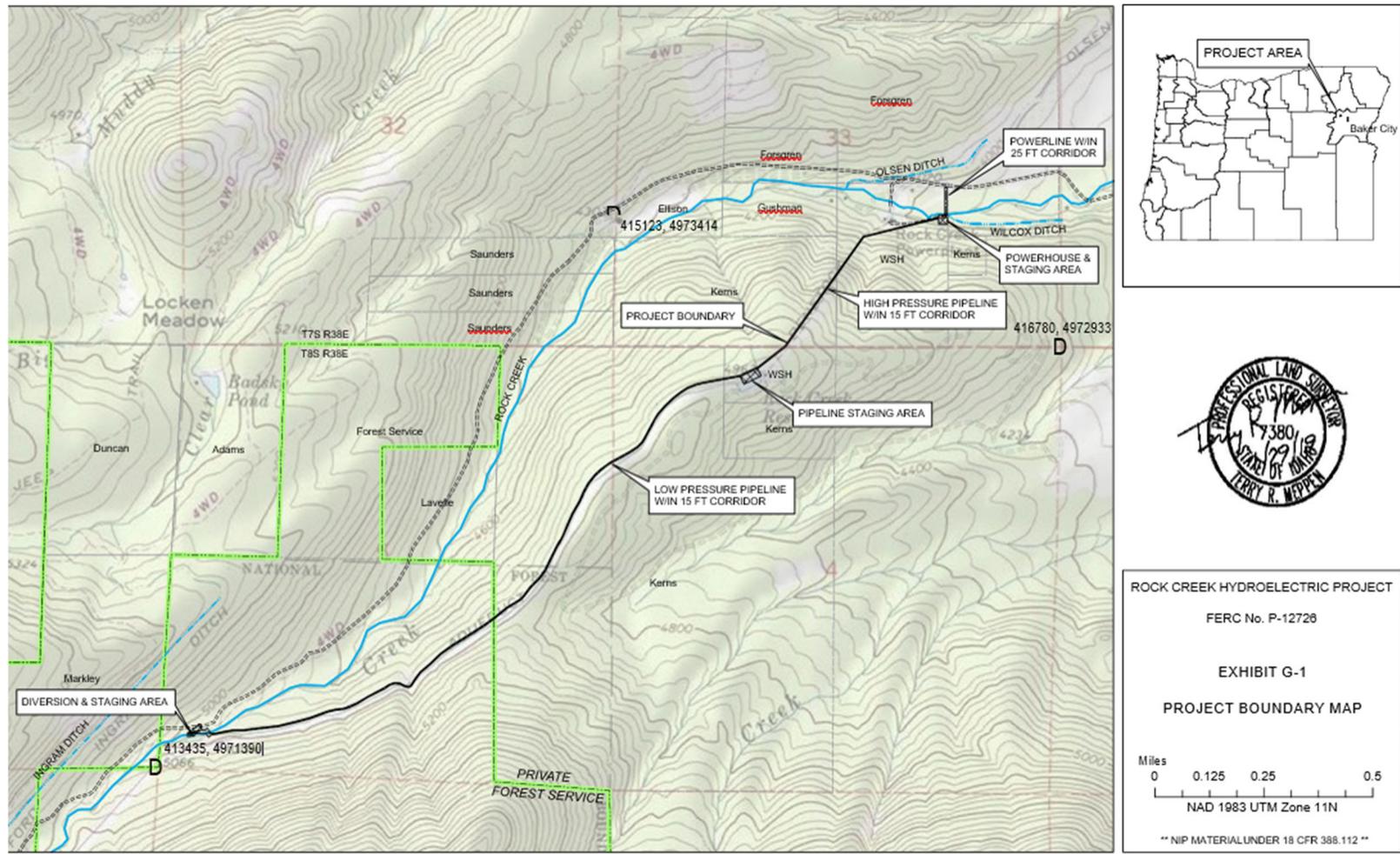


Figure 1. Location of the proposed Rock Creek Project (Source: Warm Springs Hydro, as modified by staff).

1.3.1.2 Section 4(e) Federal Land Management Conditions

Section 4(e) of the FPA provides that any license issued by the Commission for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. Forest Service filed preliminary conditions on November 8, 2019, pursuant to section 4(e) of the FPA (Appendix B). These preliminary conditions are described under section 2.2.4, *Modifications to Applicant's Proposal – Mandatory Conditions*.

1.3.1.3 Section 30(c) Management Conditions

Under section 30(c) of the FPA, applicants seeking benefits under the Public Utility Regulatory Policies Act of 1978 (PURPA) for a new hydroelectric license or exemption issued by the Commission are subject to mandatory conditions provided by federal and state fish and wildlife agencies to prevent loss of, or damage to, fish and wildlife resources affected by the project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. Warm Springs believes that the project meets the definition under 18 C.F.R. § 292.202(p) for a new dam or diversion, and therefore section 30(c) conditions apply to the proposed project.

On November 12, 2019, FWS and the Oregon Department of Fish and Wildlife (Oregon DFW) filed preliminary conditions under section 30(c) of the FPA (Appendices C and D, respectively). These preliminary conditions are described under section 2.2.4, *Modifications to Applicant's Proposal – Mandatory Conditions*.

1.3.2 Clean Water Act

Under section 401 of the Clean Water Act (CWA), a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the CWA. Warm Springs applied to the Oregon Department of Environmental Quality (Oregon DEQ) for water quality certification (WQC) for the project. Oregon DEQ received this request on December 23, 2019. The WQC is due by December 23, 2020.

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. Warm Springs' application identified such species that are known to occur or may occur within the proposed project area. On June 10, 2020, staff accessed the FWS's Information, Planning, and Conservation System (IPaC) website to determine if additional federally listed species potentially occur in the proposed project area.

One endangered species, the gray wolf (*Canis lupus*), and one threatened species, the bull trout (*Salvelinus confluentus*), were identified as potentially occurring in the vicinity of the proposed project or in downstream areas. In addition, one candidate for listing, the whitebark pine (*Pinus albicaulis*), was also listed as potentially occurring in the project area. No critical habitats occur in the project area. Our analyses of potential project effects on gray wolf, bull trout, and whitebark pine are presented in section 3.3.5, *Threatened and Endangered Species* and our recommendations are presented in section 5.1, *Comprehensive Development and Recommended Alternative*.

Bull trout are not known to occur in Rock Creek and no critical habitat for the species has been designated in waters that would be affected by the project. Similarly, whitebark pine has not been documented or known to be present in the project area. Based on these findings, we conclude that licensing the proposed project, as provided for in the staff alternative with mandatory conditions, would have "no effect" on whitebark pine and bull trout, or its critical habitat.

In 2011, the gray wolf was delisted within the Northern Rocky Mountain Gray Wolf Population Area, which includes the proposed project area. Gray wolves are listed as federally endangered under the ESA in western Oregon but are not federally protected in the proposed project area.¹ Based on these analyses, we conclude that constructing and operating the Rock Creek Project, as provided for in the staff alternative with mandatory conditions, would have "no effect" on the federally protected gray wolf.

¹ We note that the IPaC lists by both Warm Springs and Commission staff include the gray wolf. However, Warm Springs' FLA states, and FWS's Environmental Conservation Online System results for Baker County, Oregon (<https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=41001>), confirm, the gray wolves in the project area are included in the Northern Rocky Mountain Distinct Population Segment, which was delisted in 2011. As such, a "no effect" call is warranted; however, due to conflicting information, we will request confirmation from FWS that the inclusion of gray wolf in the IPaC listing for the project area is incorrect.

1.3.4 Coastal Zone Management Act

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. § 1456(3)(A) (2018), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of Warm Spring Hydro's certification.

The project is not located within the state-designated Coastal Management Zone, which generally extends inland to the crest of the coastal range and the project would not affect Oregon's coastal resources. Therefore, the project is not subject to Oregon coastal zone program review and no consistency certification is needed for the action. On March 19, 2020, Warm Springs filed a record of email correspondence from Oregon Coastal Zone Management Program in which they concur that the project would have no effect on the Oregon Coastal Zone.

1.3.5 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that the Commission take into account the effects of its actions on historic properties and afford the Advisory Council on Historic Preservation (Advisory Council) a reasonable opportunity to comment on the undertaking.² Historic properties are those that are listed or eligible for listing in the National Register of Historic Places (National Register). The regulations implementing section 106 of the NHPA also require that the Commission seek concurrence with the state historic preservation office on any finding involving effects or no effects on historic properties, and consult with interested Indian tribes or Native Hawaiian organizations that attach religious or cultural significance to historic properties that may be affected by an undertaking. In this document, we also use the term "cultural resources" for properties that have not been determined eligible for listing in the National Register. Cultural resources represent things, structures, places, or archaeological sites that can be either prehistoric or historic in origin. In most cases, cultural resources less than 50 years old are not considered historic.

² An undertaking means "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval." 36 C.F.R. § 800.16(y) (2019). Here, the undertaking is the potential issuance of an original license for the proposed Rock Creek Project.

Portions of two historic properties are located within the project’s area of potential effects (APE), the first consisting of a penstock portion and reservoir associated with the Rock Creek Power Plant Historic District (FERC Project No. 1986), which was decommissioned in 2003, and the second consisting of a recently installed diversion structure/head gate associated with the historic Wilcox Ditch. Warm Springs proposes to avoid both historic properties during project construction and during subsequent project operation and maintenance. In review of the information provided by Warm Springs, we concluded that the proposed project would have no adverse effects to historic properties, and on March 26, 2020 we issued a letter to the Oregon State Historic Preservation Office (Oregon SHPO) seeking their concurrence on this finding. In a letter filed on April 22, 2020, the Oregon SHPO responded that it concurs with our finding that the proposed project would have no adverse effects to historic properties.

1.4 PUBLIC REVIEW AND COMMENT

The Commission’s regulations (18 C.F.R., sections 5.1 – 5.16) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, ESA, NHPA, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission’s regulations.

1.4.1 Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. A scoping document (SD1) was distributed to interested agencies and others on June 12, 2007. It was noticed in the Federal Register on June 19, 2007. Two scoping meetings were held on July 12, 2007, in Haines, Oregon, to obtain comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and these are part of the Commission’s public record for the project. In addition to the comments provided at the scoping meetings, the following entities have filed written comments:

<u>Commenting Entity</u>	<u>Date Filed</u>
U.S. Forest Service	August 3, 2007
U.S. Fish and Wildlife Service	August 10, 2007
Oregon Departments of Fish and Wildlife and Environmental Quality	August 13, 2007

1.4.2 Interventions

On September 13, 2019, the Commission issued a notice accepting Warm Springs' application for an original license for the Rock Creek Project. This notice, which was published in the *Federal Register* on September 19, 2019, set November 12, 2019, as the deadline for filing protests and motions to intervene. In response to the notice, the following entities filed notices of intervention or motions to intervene:

<u>Intervenor</u>	<u>Date Filed</u>
Oregon Department of Environmental Quality	October 30, 2019
Oregon Department of Fish and Wildlife	November 7, 2019
U.S. Department of the Interior	November 8, 2019
U.S. Forest Service	November 8, 2019
WaterWatch of Oregon ³	November 13, 2019

1.4.3 Comments on the Application

The September 13, 2019 notice also solicited comments, preliminary terms and conditions, and recommendations. The following entities commented:

<u>Commenting Entity</u>	<u>Date Filed</u>
Oregon Department of Environmental Quality	October 23, 2019
U.S. Forest Service	November 8, 2019
Oregon Department of Fish and Wildlife	November 12, 2019
U.S. Department of the Interior ⁴	November 12, 2019
WaterWatch of Oregon	November 13, 2019

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

The no-action alternative is license denial. Under the no-action alternative, the Rock Creek Project would not be constructed and the environmental resources in the project vicinity would not be affected. This is the baseline against which the action alternatives are compared.

³ WaterWatch Oregon filed a late motion to intervene, which was granted by the Secretary's notice on May 12, 2020.

⁴ Comments were filed by the U.S. Department of the Interior on behalf of FWS.

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Facilities and Operation

The Rock Creek Hydro Project would be located near Haines, Oregon with a generating capacity of 850 kW and an estimated annual power output of 3,900 MWh. New facilities would be constructed in the same location as a previous hydroelectric plant that operated on Rock Creek from 1904 to 1995. Just as for the prior project, the proposed project would utilize water diverted from Rock Creek, a tributary of the Powder River. A new diversion and intake structure would be built on Rock Creek at the location of the historic diversion structure and would consist of a low concrete weir across Rock Creek, a roller head gate, a fish screen, and a pipeline intake structure. The diverted flow would be conveyed via an 11,400-foot-long buried pipeline to a new powerhouse containing an 850-kW turbine-generator. Water would be discharged from the powerhouse back into Rock Creek approximately 2.3 miles below the point-of-diversion. A 350-foot-long, 12.5-kilovolt (kV) transmission line would connect the generating facility to an Oregon Trail Electric Consumers Cooperative distribution line with access to the regional utility grid.

The project would have a hydraulic capacity of 13 cubic feet per second (cfs). Power generation would be secondary to a bypassed reach minimum flow proposed to be provided in Rock Creek (i.e., no diversion for hydropower would occur until the instream flow requirement was met). Plant operation would be run-of-river as follows: after meeting minimum flow requirements the turbine would adjust to changes in river flow and divert all water up to 13 cfs into the pipeline for use in power production. Any flow in excess of the minimum flow plus 13 cfs would remain in the stream channel. Conformance with minimum flow requirements would be measured at a gauging station located at the diversion weir.

Warm Springs intends to sell the output from the project to Idaho Power under the provisions of the 1978 PURPA Act. Station service, estimated at less than 1 percent of the total output, would be provided by the plant with the remainder being transmitted to Idaho Power via the proposed new 12.5-kV transmission line and Oregon Trail Electric Co-Op (OTEC) distribution lines.

2.2.2 Project Safety

As part of the licensing process, the Commission would review the adequacy of the proposed project facilities. Special articles would be included in any license issued, as appropriate. Commission staff would inspect the licensed project both during and after construction. Inspection during construction would concentrate on adherence to Commission-accepted plans and specifications, special license articles relating to construction, and accepted engineering practices and procedures. Operational inspections would focus on continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance.

The project would be designed with fail-safe devices to assure that water flow would be directed back into the natural Rock Creek channel in the event of unexpected failure of the diversion or powerplant. The safety of electrical systems would be assured by use of industry standard protection systems.

2.2.3 Proposed Environmental Measures

Warm Springs proposes the following environmental measures for the Rock Creek Project.

- Implement an Erosion Control Plan (Appendix B, FLA) that includes measures to minimize erosion and avoid adverse effects on turbidity and sedimentation in Rock Creek during project construction.
- Implement a Minimum Flow Plan (Appendix B, FLA) that includes measures to maintain seasonal minimum instream flows downstream of the project diversion (vary on biweekly intervals from 6-12 cfs August 1 through April 30 and 15-20 cfs May 1 through July 31) and install a flow gauge below the diversion to ensure compliance with the project minimum flow requirements.
- Implement a Water Quality Management Plan (Appendix B, FLA) that includes measures to reduce the potential release of fuels or hazardous liquids during project construction (i.e., restrict motorized equipment from the stream channel, inspect and repair construction equipment daily) and curtail project diversions during project operation, if needed, to prevent excessive warming of water in the bypassed reach.
- Design, in consultation with the Forest Service, and install fish passage and a fish screen as part of the diversion structure to allow both upstream and downstream movement of fish past the diversion and to prevent entrainment of fish into the project pipeline.
- Implement a Fishery Habitat Mitigation Plan (Appendix B, FLA) that includes measures to consult with fishery stakeholders to identify a fishery enhancement project (e.g., culvert replacements, large woody debris placement, and screening of irrigation diversions) that would mitigate for fishery habitat losses due to reduced flow in the bypassed reach during project operation.
- Implement a Revegetation Plan (Appendix B, FLA) that includes measures to revegetate all areas disturbed by project construction in order to minimize effects to wildlife habitat.

- Design the poles for the 350-foot-long transmission line to maintain conductor spacing and geometry for raptor protection consistent with 1996 Avian Power Line Interaction Committee (APLIC)⁵ standards.
- Remove all sections of wooden flume from the previously-licensed project on Forest Service land along the pipeline corridor to eliminate a movement barrier and enhance habitat for large animals such as deer and elk.
- Construct the pipeline to include overhead sections at Rock Creek and at two small ravines to prevent disturbance to the Rock Creek stream channel and seasonally flowing springs in the ravines, and to minimize effects of the project on wildlife movement.
- Retain a line of trees to screen the powerhouse from the view of Rock Creek Road.
- Conduct an annual open house to allow the public to visit the historic powerhouse facilities.

2.2.4 Modification to Applicant’s Proposal – Mandatory Conditions

The following preliminary conditions have been provided and are evaluated as part of Warm Springs’ proposal.

Section 4(e) Land Management Conditions

The Forest Service filed 13 preliminary conditions under section 4(e) for the project, which are shown in Appendix B. We consider conditions 1 – 6, parts of 7, and 9 to be administrative in nature and as such they are not addressed further in the EA. The remaining 6 conditions are summarized below.

- Condition 7 – Revise the proposed Erosion and Sediment Control Plan⁶ to include, in addition to certain administrative provisions, monitoring of sediment and erosion control measures for three years for compliance with prescribed

⁵ APLIC is a collaboration among numerous electrical utilities and research groups and FWS that was formed to identify the causes of, and develop methods and designs to minimize, avian electrocutions and collisions at power lines. APLIC has released guidelines to address avian electrocution (APLIC, 2006), collision (APLIC, 2012), and the development of national Avian Protection Plan guidelines (APLIC and FWS, 2005).

⁶ Referred to as “Erosion Control Plan” in the FLA.

performance measures; and consulting with Forest Service if re-vegetation measures are not met within three years.

- Condition 8 – Revise the proposed Revegetation Plan to include: (1) mapping the conifer and deciduous trees to be removed in the penstock right-of-way; (2) seeding the penstock right-of-way, including the cut banks and out slopes, with Forest Service-approved native plant seeds; and (3) monitoring for invasive plant species presence at proposed project facilities where ground-disturbing activities occur on National Forest Service lands.
- Condition 10 – Revise the proposed Project Flow Operations Plan to include provisions for instream flows, run-of-river operations, ramping rates, and gauge locations for instream flow monitoring.
- Condition 11 – Develop a fish passage plan in consultation with FWS and Oregon DFW. Upstream fish passage facilities will meet criteria of Oregon DFW and downstream fish passage facilities including screen will meet criteria of the National Marine Fisheries Service.
- Condition 12 – Revise the proposed Aquatic Habitat Mitigation Plan⁷ to include: (1) additional site selection criteria that establish a preference for proximity, in-kind, measures on National Forest Service land; (2) procedures for maintaining and monitoring mitigation sites over the term of the license; and (3) procedures for reducing project diversions during periods when project operation is likely to cause an increase of water temperature in the bypassed reach by more than 0.5 degrees Fahrenheit (°F).
- Condition 13 – Develop a fire and fuels management plan that includes measures for fuel treatment/vegetation management, fire prevention and patrol, emergency response preparedness, reporting, and fire control/extinguishing.

Section 30(c) Fish and Wildlife Conditions

As stated in section 1.3.1.3, *Section 30(c) Mandatory Conditions*, applicants seeking benefits under PURPA for a new hydroelectric license or exemption issued by the Commission are subject to mandatory conditions provided by federal and state fish and wildlife agencies to prevent loss of, or damage to, fish and wildlife resources affected by the project. FWS filed 18 preliminary conditions under section 30(c) for the project, which are shown in Appendix C. We consider conditions 1-3, 7, 12, and 15 – 16 to be administrative in nature and as such they are not addressed further in the EA. The

⁷ The Aquatic Habitat Mitigation Plan (Forest Service 4(e) condition 12) refers to the Fishery Habitat Mitigation Plan in Appendix B of the FLA.

remaining conditions are summarized below. Oregon DFW filed 15 preliminary conditions under section 30(c) for the project, which are provided in Appendix D. We consider conditions 1, 6, and 11 – 13 to be administrative in nature, and as such they are not discussed further in the EA. The remaining conditions largely mirror those filed by FWS, with some variation, and both are listed below.

- Minimum Flow and Mitigation for Fish Habitat Impacts (FWS condition 4; Oregon DFW condition 3): Operate in run of river mode during all times of generation. Ensure a continuous minimum flow from the Project diversion structure into the Rock Creek bypassed reach that meets Oregon DFW’s 1992 recommended flows in IS 72194⁸ until and unless mitigation is approved and completed for the loss of fish habitat as described in the FWS (condition 4) and Oregon DFW (condition 3) 30(c) conditions. Cease diverting streamflow when natural inflow to the project is equal to or less than the required minimum flow. If mitigation is completed, Warm Springs may adjust minimum flows per the 30(c) conditions. Develop a gauge installation and data reporting plan for installing and maintaining a gaging station in the bypassed reach immediately downstream of the diversion dam and providing annual reports.
- Ramping Rates (FWS and Oregon DFW condition 5): Operate the project to adhere to ramping restrictions and minimize project-induced flow fluctuations in the Rock Creek bypassed reach. Restrict ramping rates to 1-inch per hour from May 1 to October 31 to protect larval redband trout, and 2-inches per hour from November 1 to April 30 to protect juvenile and adult rearing.
- Operations and Maintenance Plan (FWS condition 6; Oregon DFW condition 4): Develop an operation and maintenance plan that establishes procedures for maintaining minimum instream flows, adhering to specified ramping rates, and operating and maintaining the upstream and downstream fish passage facilities.
- Terrestrial Wildlife Resources (FWS condition 8; Oregon DFW condition 9): Develop a terrestrial wildlife resource management plan (TWRMP) to minimize the impacts to wildlife that result from project construction, operation, and maintenance.
- Spring Connectivity and Wetland Impact (FWS condition 11; Oregon DFW condition 10): Develop within the TWRMP a strategy and schedule to mitigate for any permanent loss of terrestrial habitat, including springs and wetlands.

⁸ Instream Water Right

- Erosion and Sediment Control (FWS condition 9; Oregon DFW condition 7): Revise the proposed Erosion Control Plan to describe the specific rehabilitation techniques and monitoring elements necessary to mitigate all ground disturbing activities during project construction, operation, and maintenance.
- Revegetation and Noxious Weed Management Plan (FWS condition 10; Oregon DFW condition 8): Revise the proposed Revegetation Plan to include measures such as: best management practices to prevent the establishment and spread of invasive non-native plants; cleaning and inspection programs for all construction equipment; limiting construction activity to previously disturbed areas, to the extent possible; ensure materials used on Forest Service land are inspected by a District or Forest weed specialist and judged to be weed-free; implement noxious weed control measures to ensure all disturbed areas are treated; monitor for noxious weed control and re-vegetation efforts; replant all disturbed soils with approved seed mixes or native plants; and additional measures, as needed, if initial re-seeding and replanting efforts are unsuccessful.
- Downstream and Upstream Fish Passage Facilities (FWS condition 13; Oregon DFW condition 2): Design, construct, evaluate, operate, and maintain the proposed upstream and downstream fish passage facilities at the diversion dam to provide for the safe, timely, and effective passage of native fish species, primarily redband trout. Consult with FWS, Oregon DFW, and the Forest Service on the preliminary and final designs for the fish passage facilities. Develop operation and maintenance procedures (including operator training and supervision) that includes routine maintenance inspections and implementation of timely repairs and ensures that the fish passage facilities operate effectively during the term of the license.
- Post-Construction Evaluation and Monitoring Plan (FWS condition 14; Oregon DFW condition 2.5): Prior to completion of the fish passage facilities, develop in consultation with the Oregon DFW, FWS, and Forest Service a post-construction hydraulic evaluation plan, monitoring plan, and implementation schedule for all fish passage facilities.
- Bull Trout Documentation in the Project Area (FWS condition 17; Oregon DFW condition 14): Document bull trout observed or collected in the project area.
- Stream Crossing Prior Approval (FWS condition 18; Oregon DFW 15): Consult with FWS, Forest Service, Oregon DFW, and Oregon DEQ for prior approval of locations and designs for construction of temporary stream crossings to be used during project construction activities, including, but not limited to, pipeline construction.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include Warm Springs' proposed measures, along with all mandatory conditions filed by the agencies except for those related to the minimum flow release schedule (FWS 30(c) condition 4; Oregon DFW 30(c) condition 3), Fish Habitat Mitigation (Forest Service 4(e) condition 12; FWS 30(c) condition 4; Oregon DFW 30(c) condition 3), and the Spring Connectivity and Wetland Impacts (FWS 30(c) condition 11; Oregon DFW 30(c) condition 10), and the additional staff-recommended measures below.

- Revise the Minimum Flow Plan to include the installation of a second gauging station, located below the Olsen Ditch irrigation diversion within the bypassed reach to provide continuous streamflow data
- In the event that archeological resources are discovered, cease construction and notify Oregon SHPO and Forest Service (if on their lands) and develop an HPMP if the resource is determined to be eligible for the National Register.

2.4 STAFF ALTERNATIVE WITH MANDATORY CONDITIONS

We recognize that the Commission is required to include valid 4(e) conditions and 30(c) conditions in any license issued for the project. Thus, the staff alternative with mandatory conditions includes staff-recommended measures and all 4(e) and 30(c) mandatory conditions filed by the agencies.

3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and other recommended environmental measures. Sections are organized by resource area, with historic and current conditions described first. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives. Staff conclusions and recommended measures are discussed in section 5.1, *Comprehensive Development and Recommended Alternative*.⁹

⁹ Unless otherwise indicated, our information is taken from the applicant's FLA for this project (Warm Springs, 2019) and the additional information responses filed July 26, 2019 (Warm Springs, 2019a) and February 14, 2020 (Warm Springs, 2020).

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The proposed project is located on Rock Creek, which flows east from a point of origin at Rock Creek Lake in the Elkhorn Mountains about 16.3 miles to its confluence with the Powder River. Rock Creek is one of eight major creek/drainage basins on the east slope of the Elkhorn Mountains (Salmon Creek, Marble Creek, Mill Creek, Goodrich Creek, Pine Creek, Willow Creek, Rock Creek, Big Muddy Creek). All of these creeks drain into the Powder River in the Haines, Oregon area (Warm Springs, 2019).

Rock Creek begins at Rock Creek Lake at approximately 7,675 feet of elevation. Below the lake, Rock Creek runs through subalpine forests. The grade of the stream bed is quite high in this area and includes two waterfalls. The steep stream gradient continues through a mixed-conifer habitat below Eilertson Meadow (5,500 feet elevation). This section of Rock Creek includes the project reach. About 1.6 miles below the proposed Rock Creek Project boundary (4,000 feet elevation) Rock Creek leaves the forest and enters Baker Valley where the water is diverted for irrigation purposes. The gradient of Rock Creek is much shallower in this area and the channel meanders through alfalfa and pastureland toward its confluence with the Powder River. The consumptive water rights for irrigation exceed available flow during peak irrigation season and the lower stretches of Rock Creek beginning near Haines are completely dewatered. The dewatered period varies from year to year, but Rock Creek is disconnected from the Powder River for several months during most summers.

Headwater branches of Rock Creek originate beneath the crest of the Elkhorn Range about 6-7 miles from the proposed powerhouse site. Over this distance elevation ranges from over 9,000 feet at the crest, to about 4,000 feet at the powerhouse discharge. The stream gradient throughout the watershed above the project is steep and the proposed project is situated to take advantage of a portion of the elevation drop.

The proposed Rock Creek Project is located in Baker County, Oregon approximately 6 miles west of the city of Haines. The project lies within the Blue Mountains Ecoregion, which extends from the Redmond area of Central Oregon, across a wide swath of the Columbia Plateau in Eastern Oregon, to Hells Canyon on the Snake River at Oregon's and Washington's border with Idaho. The ecoregion is named for the Blue Mountains and contains a complex of basins and mountain ranges that are lower and more open than the neighboring Cascades and Northern Rocky Mountains but do include some steep landscape.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing National Environmental Policy Act of 1969 (40 C.F.R., section 1508.7), a cumulative effect is the impact on the environment that results from the incremental

impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

Based on review our review of the license application and agency and public comments, we have identified water and fisheries resources as having the potential to be cumulatively affected by the project. Although our scoping documents issued in 2007 also identified geology and soils and wildlife resources as having the potential to be cumulatively affected, we no longer find them to have that potential due to changes in the project proposal since that time, including changes to the proposed project design and proposed measures to control erosion and mitigate habitat connectivity for large wildlife. Our analysis of cumulative effects are found in section 3.3.2.3, *Water Resources, Cumulative Effects*, and 3.3.3.3, *Fisheries Resources, Cumulative Effects* of this EA.

3.2.1 Geographic Scope

The geographic scope of analysis for cumulatively affected resources is defined by the physical limits or boundaries of: (1) the proposed action's direct and indirect effects on the resources, and (2) contributing effects from other hydropower and non-hydropower activities within the geographic scope of analyses. Because the proposed action would affect resources differently, the geographic scope of analysis for each resource may vary.

The Rock Creek drainage basin from upstream portion of the project boundary downstream to the confluence with the Powder River is the geographic scope of analysis for water and fisheries resources. This area was chosen because the project's cumulative effects on water quality and fisheries is limited to this area (i.e., the project would not result in measurable direct or indirect effects to water quality upstream or downstream of this area).

3.2.2 Temporal Scope

The temporal scope of analysis includes a discussion of the past, present, and reasonably foreseeable future actions and their effects on water and aquatic resources, terrestrial resources, recreation resources, and cultural resources. Based on the potential term of a license, the temporal scope looked 30 to 50 years into the future, concentrating on the effect on the resources from reasonably foreseeable future actions. The historical discussion is limited, by necessity, to the amount of available information for each resource. We identified the present resource conditions based on the license application, agency comments, and comprehensive plans.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the site-specific environmental issues.

Only the resources that have the potential to be affected are addressed in this EA. Based on this, we have determined that geology and soils, aquatic resources, terrestrial resources, recreation and land use resources, aesthetic resources, and cultural resources may be affected by the proposed action and action alternatives. We present our recommendations in section 5.1, *Comprehensive Development and Recommended Alternative*.

3.3.1 Geology and Soils

3.3.1.1 Affected Environment

The proposed project would lie within the Blue Mountains Ecoregion, which extends from the Redmond area of Central Oregon, across a wide swath of the Columbia Plateau in Eastern Oregon, to Hells Canyon on the Snake River at the border of the three states. The mountains of the ecoregion include the Strawberry Range, Greenhorn, Elkhorn, Aldrich and Maury Mountains in the Blue Mountains, the gentler Ochoco Mountains to the west and the rugged Wallowa Mountains to the east. The Blue Mountains are mostly volcanic in origin. However, the core of the Blue Mountains and the highest ranges, the Wallowa and Elkhorn mountains, are composed of granitic intrusives, deep sea sediments, and metamorphosed rocks.

The proposed project reach of Rock Creek would lie within a steep, rocky canyon. The large boulders and cobbles forming much of the streambed are derived from igneous and metamorphic parent materials. The penstock route is located within soils mapped by Natural Resource Conservation Service as Tolo-Dogtown complex, a deep well-drained silt and gravelly loam up to 60 inches deep. The diversion and powerhouse sites, which would be located adjacent to the Rock Creek streambed, occur within areas mapped as Tolo-Crackler complex, which is similar to the Tolo-Dogtown complex.

3.3.1.2 Environmental Effects

The proposed project would include the construction of new facilities that would result in ground disturbance that could lead to erosion and sedimentation. Materials excavated and temporarily stored would also be susceptible to erosion. Warm Springs proposes to implement an Erosion Control Plan that includes measures to minimize both

short- and long-term soil erosion and to minimize sedimentation and turbidity in Rock Creek during project construction.

The proposed Erosion Control Plan includes the following general control measures: (1) conduct all in-water work during the Oregon in-water work window¹⁰ from July 1 to October 31 when flows in Rock Creek are normally between 10 - 20 cfs and the active channel is narrow; (2) conduct turbidity monitoring during all construction activities having the potential to increase sedimentation in Rock Creek; and (3) adhere to Oregon DEQ¹¹ and Forest Service best management practices (BMPs) in the design, installation and maintenance of erosion controls.

The proposed Erosion Control Plan includes the following specific control measures: (1) construct the pipeline, powerhouse, and tailrace during the dry months in summer and fall when rainfall is minimal and the active channel of Rock Creek is narrow; (2) install a silt fence on the downhill side of any excavation and staging areas required for diversion construction, pipeline construction areas and any pipeline sections where natural drainage patterns could create surface flow across any open excavation or backfilled trench, powerhouse construction staging areas, and along sections of banks along Rock Creek that lie below ground disturbing activities; (3) construct a cofferdam to temporarily dewater a short reach of Rock Creek during construction of the diversion and fish screen; (4) install a concrete washout station in accordance with Oregon DEQ's BMPs that would be located within the main staging area near the powerhouse site; (5) contour and revegetate all areas disturbed during construction of the diversion, the backfilled trench, and the powerhouse; (6) pressure test and periodically inspect pipeline for leaks to minimize the potential for soil saturation that could destabilize slopes and lead to mass wasting along the pipeline route; (7) excavate the pipeline trench in segments, backfilling as each new section of the pipeline is completed, to minimize the amount of soil that must be stockpiled at any one time; (8) stockpile soils from the pipeline trench excavation on the existing flattened corridor that was graded when the original hydroelectric project was constructed; and (9) design the tailrace discharge to prevent ongoing erosion in the area where the original stream bank is modified.

¹⁰ Oregon DFW has established in-water work windows for streams in Oregon. In-water work activities are defined as any ground-disturbing activities within the beds and banks of waters of the state, also known as the "regulated area". These guidelines provide the public a way of planning in-water work during periods of time that would have the least impact on important fish, wildlife, and habitat resources. The guidelines are available online at:
https://www.dfw.state.or.us/lands/inwater/Oregon_Guidelines_for_Timing_of_%20InWater_Work2008.pdf

¹¹ Available online at:
<https://www.oregon.gov/deq/FilterPermitsDocs/BMPManual.pdf>

Forest Service, FWS, and Oregon DFW filed virtually identical conditions (Forest Service 4(e) condition 7, FWS 30(c) condition 9, Oregon DFW 30(c) condition 7) for Warm Springs to revise its proposed Erosion Control Plan to include the following additional measures: (1) monitor sediment and erosion control measures for three years following the completion of project construction for compliance with the following performance measures: (a) ground cover in disturbed area equals or exceeds 80 percent of that within an undisturbed control area that has similar vegetation and is adjacent to the project area; (b) species composition in disturbed areas equals or exceeds 75 percent non-weedy species; and (c) soil erosion areas shall be reported if rills exceed two inches in depth or six inches in width; (2) consult with FWS, Forest Service, Oregon DFW, and Oregon DEQ if re-vegetation performance measures are not met with three years to identify and implement additional measures; (3) grade and revegetate all disturbed soils as soon as possible following the ground disturbance activity with priority given to native species that are locally adapted; (4) dewater all work areas behind temporary cofferdams or isolated work areas below the ordinary highwater mark; (5) dispose of all construction debris on land so that the debris cannot enter the waterway or cause quality degradation of state waters and use retention areas, swales or impoundments to prevent discharge of water from construction staging areas; (6) identify measures to be taken to ensure that any project-related construction will not increase turbidity and sediment discharge into Rock Creek; and (7) consult with FWS, Oregon DFW, Forest Service, and Oregon DEQ 90 days before commencing any necessary project-related land-clearing, land-disturbing, or spoil-producing activities following the completion of project construction.

Our Analysis

Land disturbance and in-water construction can lead to sedimentation that could adversely affect water quality. Sediments from construction materials and equipment could also be released into the river, impoundments, and wetland areas during the construction of the diversion and intake structures which would include fish passage and screen facilities on the Rock Creek, the construction of the buried pipeline, and the construction of the powerhouse tailrace and the transmission facilities. Sediments can clog stream channels and affect aquatic resources by covering fish spawning habitat and reducing downstream water quality. The movement of personnel and heavy equipment in and around water during construction would also likely result in localized short-term shoreline erosion and sedimentation.

Even though these activities have the potential to contribute to erosion of soils and sedimentation, any potential effects on soils from construction activities would be temporary and limited to the construction footprint. The Commission's standard terms and conditions for a hydropower license would require a licensee to take reasonable measures in the construction, maintenance, and operation of a project to prevent stream sedimentation and soil erosion on lands adjacent to streams or other waters.

The applicant's proposal would limit the amount of disturbed ground. The use of silt fences, cofferdams, concrete wash out stations, and quickly revegetating disturbed areas are commonly accepted BMPs for controlling soil erosion and sedimentation and should be sufficient in controlling erosion if properly designed, implemented and maintained. The applicant's proposal to conduct the in-water work during the dry months when the flows in Rock Creek are lower and the active channel is narrow would minimize the potential for soil saturation that could destabilize slopes and lead to mass wasting along the pipeline route. However, detailed erosion control measures should be based on site-specific conditions and final design of project features and additional erosion and sediment control measures should be implemented as required by the agencies and described above (Forest Service 4(e) condition 7, FWS 30(c) condition 9, and Oregon DFW 30(c) condition 7).

3.3.2 Water Resources

3.3.2.1 Affected Environment

Water Quantity

The water source for the proposed project is Rock Creek, which flows east from its headwaters in Rock Creek Lake for 16.3 miles to its confluence with the Powder River. Throughout the project reach, Rock Creek is characterized by steep stream gradients and the proposed project is situated to take advantage of a portion of the elevation drop.

Flow in Rock Creek is gauged by the Oregon Water Resources Department (Oregon WRD) Station ID 13281200, located about 750 feet downstream of the proposed powerhouse site. Monitoring data compiled from 1997-2016 were used to evaluate historic water quantity in Rock Creek and

Table 1 gives monthly exceedance flows based on this data. From 1997 to 2016, average peak flows in May and June have been around 106 cfs; average base flows in October through February have been around 9.5 cfs (Oregon WRD Station ID 13281200; Table 3). For 8-10 weeks each summer, typically in July and August, flow through the project reach is enhanced for irrigation deliveries. The outlets of two small lakes in the headwaters of Rock Creek, Rock Creek Lake and Killamacue Lake, have been modified to permit storage and release of water for irrigation. Controllable storage is about 500 acre-feet for Rock Creek Lake and about 350 acre-feet for Killamacue Lake.

Table 1. Monthly flow exceedance based on 1997-2016 flow records for Station 13281200 (in cfs) (Source: Warm Springs, 2019).

Month	Percentage of Time Flow Equaled or Exceeded										
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
January	108.0	17.0	12.0	11.0	9.1	8.4	7.7	6.8	6.2	4.9	1.4
February	41.0	16.0	11.0	11.0	9.8	8.7	8.2	7.5	6.4	5.6	0.6
March	49.0	23.0	19.0	15.0	13.0	10.0	9.1	8.1	7.3	6.0	2.2
April	268.0	63.1	45.2	35.0	29.0	24.0	21.0	18.0	15.0	12.0	5.4
May	532.0	206.1	146.2	109.3	91.0	74.5	65.0	57.0	50.0	39.9	16.0
June	468.0	210.1	163.0	127.3	105.0	83.5	70.0	63.0	54.0	38.9	19.0
July	242.0	64.1	48.0	38.0	32.0	28.0	25.0	22.0	20.0	17.0	13.0
August	43.0	26.0	24.0	22.0	21.0	19.0	18.0	16.0	15.0	12.0	5.1
September	38.0	17.0	14.0	12.0	11.0	9.5	8.0	7.4	6.7	5.8	3.8
October	44.0	12.0	9.8	8.8	8.3	7.5	7.2	6.5	6.0	5.6	4.3
November	41.0	14.0	12.0	11.0	10.0	9.3	8.4	7.6	6.9	6.3	1.0
December	44.0	13.0	12.0	9.8	8.8	8.1	7.8	7.2	6.6	6.0	2.5

Consumptive Use

Three irrigation withdrawals are made in the vicinity of the project reach of Rock Creek at the Ingram Ditch, Olsen Ditch, and Wilcox Ditch. The Ingram Ditch is upstream of the project reach,¹² the Olsen Ditch is approximately 0.25 miles upstream of the project discharge, and the Wilcox Ditch is approximately 25 feet downstream of the tailrace mouth. All three diversions remove water from Rock Creek upstream of the Oregon WRD gauging station and thus, water diverted into these ditches is unaccounted for in the gauging station records.

The amount of water diverted at the Ingram, Olsen, and Wilcox ditches is variable during the season from year to year. Withdrawals into these ditches are not gauged or recorded on a consistent basis. However, periodic watermaster records provide a general understanding of typical irrigation withdrawals over recent years. All three ditches typically begin diverting water in late April to mid-May and operate throughout the summer. In the early season (May to early June), total withdrawals are approximately 15 cfs (Ingram 5 cfs, Olsen 5 cfs, Wilcox 5 cfs). Diversions are regulated in mid-summer (late June to mid-July) and total withdrawals are reduced to about 9 cfs (Ingram 2 cfs, Olsen 2 cfs, Wilcox 5 cfs). Ingram and Olsen are usually turned off by late July, and Wilcox is turned off by early August.

¹² We estimate that Ingram Ditch is between 1,800-3,900 feet upstream of the project diversion.

Water Quality

The Oregon DEQ manages and administers water quality in Oregon.¹³ The project reach of Rock Creek is designated for bull trout spawning and juvenile rearing criterion.

No portions of Rock Creek have been designated as Category 5 (Water Quality Limited) Listed Waters for any pollutants according to the Oregon DEQ 2012 303(d) list (ODEQ, 2013).¹⁴

Temperature

Surveys were conducted by Warm Springs in 2016 as part of their Integrated Licensing Process (ILP) study plan and additional data were available from previous studies on Rock Creek related to two Commission proceedings. Oregon DEQ collected water temperature and air temperature data in 1999 and 2000 during relicensing of Project No.1986. Eastern Oregon Light & Power collected water temperature and additional data in 2008 as part of the approved study plan for the Rock Creek project. Additional surveys were conducted in 2007 and 2017.

For each field effort, temperature monitors were located at the top (diversion site) and bottom (powerhouse site) of the proposed bypassed reach and temperature data were continuously recorded. Historically, water temperatures peak in July and August. Monitoring data show that the temperature criterion of 12°C (53.6°F) provided by Oregon DEQ to protect potential bull trout spawning and juvenile rearing habitat is frequently exceeded for periods from July-September at the diversion site and from June-September at the powerhouse site.

¹³ The following water quality regulations apply for the reach:

- OAR 340-41-0028(4)(f): The seven-day-average maximum (7DAM) temperature of a stream identified as having bull trout spawning and juvenile rearing may not exceed 12°C (53.6°F)
- OAR 340-41-0028(12)(e)(A): A nonpoint source must control its heat load contribution to water temperatures such that the water body experiences no more than a 0.3°C (0.5°F) increase above the applicable criteria from all sources taken together at the maximum point of impact
- OAR 340-41-0016(2): Cold Water Criteria – dissolved oxygen may not be less than 8.0 mg/L
- OAR 340-41-0016(1)(a): Spawning Criteria, redband trout – from January 1 to May 15 dissolved oxygen may not be less than 11.0 mg/L

¹⁴ Category 5 Listed Waters are impaired waters present on a state's 303(d) list requiring total maximum daily loads (TMDLs). State's 303(d) impaired waters lists are required by the CWA and are submitted to the EPA every two years.

Dissolved Oxygen

Warm Springs measured dissolved oxygen at the powerhouse site from June to September 2016 as part of their ILP approved study plan. Dissolved oxygen (DO) levels in Rock Creek were maintained at or near saturation even at low flows in August and September, likely due to the high gradient turbulent flows present in the creek. Oxygen concentrations ranged from 8.5-11.3 milligrams per liter (mg/L) with a maximum diurnal variation of approximately ± 0.5 mg/L. Throughout this monitoring period, dissolved oxygen percent saturation ranged between 98 and 100.5 percent.

3.3.2.2 Environmental Effects

Water Quantity

Flow in the bypassed reach of Rock Creek, between the diversion weir and the powerhouse, would be reduced whenever water is withdrawn for power generation. Flow through the bypassed reach would additionally depend on incoming flow from upstream, irrigation demand within the project reach, and the 13 cfs hydraulic capacity of the power plant.

In its preliminary Minimum Flow Plan, Warm Springs proposes to operate the project in run-of-river mode and provide seasonal minimum flows required to maintain and protect aquatic habitat (

Table 2). Any water exceeding the required bypass minimum flow would be available for power generation, up to the maximum hydraulic capacity of 13 cfs, and would be diverted on a year-round basis.

Table 2. Warm Springs proposed minimum flow schedule for Rock Creek (Source: Warm Springs, 2019).

Period	Min Flow (cfs)	Period	Min Flow (cfs)
Jan 1-15	6	July 1-15	15
Jan 16-31	6	July 16-31	15
Feb 1-14	6	Aug 1-15	12
Feb 15-28	6	Aug 16-30	12
Mar 1-15	6	Sep 1-15	7
Mar 16-31	8	Sep 16-30	6
Apr 1-15	10	Oct 1-15	6
Apr 16-20	12	Oct 16-31	6
May 1-15	20	Nov 1-15	6
May 16-31	20	Nov 16-30	6
June 1-15	20	Dec 1-15	6
June 16-30	15	Dec 16-31	6

Warm Springs proposes to install a gauging station at the diversion weir, which would be rated to develop a relationship between water depth and flow over the weir, to ensure compliance with minimum flow requirements. The operation of the powerhouse would be automated, with the powerhouse control software communicating with the head level sensor located in the pool above the diversion weir to calculate instantaneous flow over the weir using the diversion weir rating curve, and adjusting the amount of flow diverted for power generation to ensure that the appropriate minimum flows are being provided year-round.

Forest Service (4(e) condition 10), FWS (30(c) condition 4), and Oregon DFW (30(c) condition 3) conditions would require Warm Springs to operate the project in run-of-river mode during all times, adhere to ramping rates, meet minimum flows before diverting flows for power generation, and set the automated control system to divert no more than 13 cfs. As discussed further in 3.3.3.2 *Fisheries Resources, Environmental Effects*, the FWS and Oregon DFW recommended minimum flow schedules are conditioned on Warm Springs revising and implementing a Fishery Habitat Mitigation Plan in consultation with Forest Service, Oregon DFW, Oregon DEQ, and Oregon WRD. Should Warm Springs not implement habitat mitigation measures, the agency required minimum flow schedule would be higher than the schedule described in

Table 2 and the preliminary Minimum Flow Plan. The higher minimum flow schedule can be found in table 7.

Forest Service (4(e) condition 10), FWS (30(c) condition 5), and Oregon DFW (30(c) condition 5), would require Warm Springs to adhere to ramping rates to minimize project-induced flow fluctuations in the Rock Creek bypassed reach in addition to the provisions already proposed in Warm Springs' preliminary Minimum Flow Plan. The agencies state that, although Warm Springs has not proposed to operate the facility for power peaking and hourly fluctuations should not occur, hydroelectric project operation can result in ramping due to project startup, shut down, unit trips, and during construction, operation, and maintenance of project facilities. Therefore, the agencies' conditions would require that Warm Springs implement ramping restrictions not to exceed 1 inch per hour from May 1 to October 31 and 2 inches per hour from November 1 to April 30 during all project start-up or shut-down activities.

Forest Service (4(e) condition 10), FWS (30(c) condition 4.5) and Oregon DFW (30(c) condition 3.5) would require Warm Springs to install, operate and maintain a gauging station at the diversion weir at the top of the Rock Creek bypassed reach. Warm Springs, in consultation with and subject to approval by FWS, Forest Service, Oregon DFW, Oregon DEQ, and Oregon WRD, shall prepare, and file for Commission approval, a gauge installation and data reporting plan including guidance on: (1) establishing the gauge in conformance with the U.S. Geological Survey (USGS) criteria and maintaining it throughout the life of any project license; (2) monitoring real-time flow at 15-minute intervals; (3) annual reporting of the amount of flow coming into the project at the gauge, the amount of flow diverted into the project, and the amount remaining in the stream below the project diversion; and (4) accessibility of the data by all agencies (Forest Service, FWS, Oregon DFW, Oregon DEQ, and Oregon WRD).

WaterWatch of Oregon (WaterWatch) filed comments on proposals in the FLA related to minimum flow compliance. WaterWatch states that: (1) Warm Springs' proposal does not propose adequate flow monitoring to both ensure compliance with minimum flows and ensure that no more than 13 cfs will be diverted at any time; (2) Warm Springs failed to address how they would account for the irrigation withdrawals from the three irrigation diversions located within the project vicinity to ensure both the irrigation water rights and minimum flows are satisfied; (3) Warm Springs' proposal to file annual reports on minimum flow compliance is inadequate and would render the minimum flows meaningless; and (4) Warm Springs' minimum flow plan does not provide adequate detail on how it would adjust project operations if bypassed reach flows were to drop below the minimum flow requirement. To ensure minimum flow compliance in the project reach, WaterWatch recommends that Warm Springs be required to install telemetric gauging stations that track and record real time flows in the bypassed reach and provide real time access to that data by agency staff and other interested parties throughout the year.

Our Analysis

Flows in Rock Creek would be reduced whenever water is withdrawn for power generation. Hydraulic capacity of the project ranges from 1 cfs to a maximum of 13 cfs. To operate the project, inflow to the project reach would have to sufficiently provide minimum flows before being diverted to generate power. Monitoring data from Oregon WRD between 1997 and 2016 indicate that on average, the project would have sufficient flows to provide minimum flows and generate electricity at maximum capacity from April to July and at reduced capacity all other times (Table 3). Minimum flows recorded at Rock Creek over this period indicate that Warm Springs would have to cease project operations entirely should flows in Rock Creek reach critically low levels (Table 3). However, monthly exceedances indicate that the likelihood of such critically dry flows occurring is very low (

Table 1). Warm Springs states that they would prioritize delivery of minimum flows to Rock Creek over power generation. As such, the proposed mode of operation would provide the seasonal hydrograph variation proposed by Warm Springs.

Table 3. Monthly mean, minimum, and maximum flow (cfs) in Rock Creek from 1997 to 2016 (Source: Oregon Water Resources Department, 2020).

Month	Flow (cfs)		
	<i>Mean</i>	<i>Min</i>	<i>Max</i>
January	10.43	1.40	108.00
February	9.77	0.61	41.00
March	13.16	2.20	49.00
April	32.48	5.40	268.00
May	103.04	16.00	532.00
June	109.59	19.00	468.00
July	37.18	13.00	242.00
August	19.20	5.10	43.00
September	10.40	3.80	38.00
October	8.47	3.80	44.00
November	9.76	-3.30	41.00
December	9.29	2.50	44.00

The proposed project is not expected to result in large or sudden fluctuations in downstream flow releases as proposed operation does not include plans for power peaking. We recognize that the development of ramping rates associated with initial construction, and any subsequent draining and refilling for maintenance purposes, of the project pool would help to minimize any effects on downstream aquatic resources resulting from sudden increases or decreases in flow. Therefore, maintaining minimum flows and implementing agency-recommended ramping rates associated with construction of the diversion weir and any start up or shut down activities would ensure any changes to flow do not adversely affect downstream aquatic resources.

Of the three irrigation diversions present in the project vicinity, only the Olsen diversion, located about 0.25 miles above the powerhouse discharge, would affect instream flow within the project reach.¹⁵ Occasional watermaster data indicates that the Olsen Ditch diverts a maximum of 5 cfs during the irrigation season between April and July. The irrigation season coincides with the high-water period when Rock Creek flows would

¹⁵ Warm Springs asserts that the Ingram Ditch would have no effect on flows in the bypassed reach as this diversion is located above the hydropower diversion. Diversion at the Wilcox Ditch would have no effect on flows in the bypassed reach because this diversion is located below the powerhouse discharge.

normally exceed hydropower capacity (13 cfs) plus minimum flow (10-20 cfs) even during low water years. Monthly flow exceedances indicate there is a 90 percent chance that necessary flows would be exceeded during the irrigation season (

Table 1). Consequently, irrigation withdrawals at the Olsen diversion are unlikely to reduce streamflow below the minimum flow threshold. However, it is possible that during extreme dry or otherwise anomalous water years, the Olsen diversion would reduce streamflow below the minimum flow threshold in the 0.25-mile section of the bypassed reach.

Flows in the project reach must be sufficient to satisfy both the irrigation water rights and minimum flows and the measurement of instream flow is necessary to ensure compliance with minimum flow requirements. The proposed gauging station located at the project diversion is necessary to ensure agency-recommended ramping rates are met during project start-up or shut-down; however, the single gauging station would not account for irrigation withdrawals made at the Olsen diversion increasing the possibility of flows dropping below minimum requirements, especially in dry years. An additional streamflow gauge located within the project reach below the Olsen irrigation diversion would ensure minimum flows are met regardless of any diversions made at the Olsen ditch. Both gauging stations would report real-time, continuous data to the powerhouse to aid in project operation and minimum flow compliance.

Finally, and as stated above, irrigation withdrawals coincide with the high-water period in Rock Creek and thus, it is highly unlikely that there would be insufficient flows for generation, minimum flows, and irrigation withdrawals during this period. However, streamflow monitoring would safeguard minimum flow compliance against anomalous years where the risk to aquatic resources is increased.

Water Quality

The proposed Rock Creek Project has the potential to have both short- and long-term effects on water quality within Rock Creek during both construction and operation. To address these potential effects, Warm Springs proposes to implement a Water Quality Management Plan that includes measures to ensure that all State of Oregon water quality standards are met during the construction and operation of the project. Warm Springs proposes to finalize the plan in consultation with Oregon DEQ.

Turbidity

Construction of the new diversion weir and fish screen structure would require ground disturbance in the immediate vicinity of Rock Creek. These activities would likely result in short-term increases in sedimentation and turbidity in Rock Creek downstream of the diversion weir site as well as the potential for accidental spills of fuel or other hazardous liquids from construction equipment.

Warm Springs outlines proposed measures in its Water Quality Management Plan to minimize construction-related effects by timing construction to occur during low water conditions (between August 1 and March 31), monitoring turbidity above and below the

construction area, and implementing industry standard erosion control measures. All monitoring would be in place prior to the start of any construction within or immediately adjacent to the Rock Creek streambed. If elevated turbidity is detected, Warm Springs proposes to cease construction until corrective measures could be put in place. Furthermore, the potential for release of fuels or hazardous liquids would be addressed by the following measures:

- No motorized equipment would enter the active stream channel
- Construction equipment would be inspected daily and any leaks would be repaired before use of equipment at the construction site
- A hazardous spill containment and cleanup kit will be maintained on site
Any accidental spill of hazardous liquids in excess of one gallon will be reported to Oregon DEQ

Temperature

During operation, the project has the potential to alter water temperatures in the project bypassed reach and below the project tailrace. Warm Springs proposes to curtail diversion during circumstances of warm air temperatures and low flow when the project is likely to cause a water temperature increase of more than 0.5°F.

Dissolved Oxygen

Warm Springs has not recommended or proposed any measures specific to maintaining DO within the project reach.

Our Analysis

Intermittent water quality monitoring conducted on Rock Creek indicates that water quality present in the project reach is of high quality and supportive of robust aquatic and fisheries resources. Rock Creek is free of Category 5 listings for any pollutants and in general, DO and temperature are within the range needed to support healthy aquatic ecosystems. Construction activities, including construction of the diversion weir and fish screen facilities, would likely increase turbidity and otherwise affect water quality in Rock Creek; however, these impacts would be confined to the short-term. Furthermore, measures outlined in Warm Springs' preliminary Water Quality Management Plan would help to mitigate any construction-related water quality impacts.

Low-head, run-of-river hydroelectric projects with riverine impoundments typically have short water retention times and are not likely to significantly alter water quality as a result of project operation. Warm Springs states that the depth of the diversion pool at the location of the weir would range from 2 feet to 3.1 feet across a range of inflow from 6 cfs to 100 cfs. Such depths are too shallow to foster stratification

of the water column, which could otherwise contribute to altered temperature and DO concentrations in the project outflows.

Based on monitoring data collected between June and September 2016, DO concentrations did not drop below 8.5 mg/L even at very low flows, well above the state cold water criteria OAR 340-41-0016(2) which requires DO in Rock Creek to be maintained above 8.0 mg/L. This is likely due to the high stream gradient that produces a large amount of turbulent, aerated flow throughout the project reach. From January 1 to May 15, OAR 340-41-0016(1)(a) requires DO to be maintained above 11 mg/L. Given that DO ranged from 8.5-11.3 mg/L during the summer months, it is highly unlikely that DO would dip below 11 mg/L any other time of the year. Furthermore, due to the short retention time of water above the project weir, it is highly unlikely that the project would significantly reduce DO in the project reach or downstream of the project. Warm Springs' proposal to curtail diversion during circumstances of warm air temperature and low flow, when the project may cause an increase of water temperature and a decrease in DO, would be sufficient to protect water quality in the project reach. During project operation, DO may be slightly reduced but it is expected that Rock Creek would continue to meet all dissolved oxygen standards under project conditions and would have no short-term or long-term adverse effects on this water quality parameter.

Oregon DEQ water quality regulation OAR 340-41-0028(12)(e)(A) requires that a nonpoint source must control its heat load contribution to water temperatures such that the water body experiences no more than a 0.5°F increase above the applicable criteria from all sources taken together at the maximum point of impact.

Warm Springs first used the Forest Service's SSTEMP water temperature model to simulate water warming during peak summer temperatures under a range of conditions including season, flow, inflow water temperature, and ambient air temperature. For climatic conditions within the range observed during 1999, 2000, 2007, 2008, 2016, and 2017, when monitoring occurred, the project would be unlikely to increase the 7-Day Average Maximum (7DAM) water temperature by more than 0.5°F (0.3°C). For inflow temperatures below 50°F, project operations would be unlikely to cause any exceedance of the 53.6°F water quality standard, except during extreme warm weather events (>65°F daily average temperature) when flows are below 15 cfs. For inflow temperatures above 50°F, flows at the powerhouse would be more likely to exceed the 53.6°F water quality standard. However, at these higher inflow water temperatures, hydropower operations are unlikely to cause an increase of more than 0.5°F, except during extreme warm weather events (>65°F daily average temperature) when flows are below 15 cfs.

Both the SSTEMP and HeatSource models were deemed inadequate by Oregon DEQ. The HeatSource model was ultimately abandoned because: (1) the model relied upon data and analytical complexity outside the scope of the project's data availability, and (2) the application of HeatSource to studies of similar scale to Rock Creek are

exceedingly limited.

SPF Water Engineering, LLC (contracted by Warm Springs) conducted a HEC-RAS model to assess the relationship between flow in the bypassed reach and the change in water temperature through the bypassed reach. HEC-RAS is a one-dimensional hydraulic model originating from the US Army Corps of Engineers' HEC-5Q water quality model. The model has been applied widely for water quality and temperature modeling by various public and private institutions.

The Rock Creek HEC-RAS model was developed as a predictive tool to allow plant operators to determine diversion rates that will ensure diversion from Rock Creek does not cause the 7DAM stream temperature in the bypassed reach to rise above 0.5°F. The final HEC-RAS model was calibrated and developed using temperature data in the summer. Therefore, the model is best suited to predict summer temperatures in Rock Creek. Summer months between July and August are those with the greatest potential to rise well above the 7DAM water quality regulation and thus, a temperature model that accurately predicts temperatures in the summer months is sufficient for this project. The final model predicts water temperature within $\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$) and can confidently be used to predict diversion rates that keep plant operation within compliance.

The water diverted into the pipeline would experience little to no heat gain during transport and would be discharged back into Rock Creek at nearly the same temperature as when it was diverted, nearly 1-3°F cooler than the water flowing in Rock Creek past the powerhouse during the hottest summer months. The combined flow in Rock Creek downstream of the powerhouse could potentially improve water quality compared to existing conditions, reducing the frequency of temperature criterion exceedances for this downstream section.

3.3.2.3 Cumulative Effects

Three irrigation water withdrawals located above, within, and below the bypassed reach reduce streamflow in Rock Creek between April and August. Withdrawals totaling between 9 and 15 cfs during the irrigation season could contribute to cumulative impacts on water quantity and quality in Rock Creek. Flow reduction caused by the three diversions could contribute to increased warming and turbidity and decreased dissolved oxygen in the project reach. The final 0.25 mile of the bypassed reach located downstream of the Olsen Ditch could be most heavily impacted by withdrawals, especially in anomalously warm and dry years. However, minimum flow requirements and ramping rates proposed by Warm Springs in its Minimum Flow Plan would likely minimize and mitigate for the cumulative effects of the irrigation withdrawals in the project vicinity.

3.3.3 Fisheries Resources

3.3.3.1 Affected Environment

Fish Community

Fish surveys in Rock Creek, including electrofishing and snorkel sampling, were conducted in 1994, 2000, 2008, 2016, and 2017. In the 2016 and 2017 surveys, environmental DNA (eDNA) sampling was also conducted.¹⁶ The 1994 survey was conducted by Oregon DFW upstream of the project reach to the extreme headwater areas. Oregon DFW reported rainbow trout and brook trout as the predominant species present during the 1994 surveys. No bull trout were reported by Oregon DFW, although a single unverified bull trout or bull trout hybrid was recorded in a hand-written margin note. The species of the fish was never verified by genetic analysis. In August 2000, the Forest Service and Oregon DFW conducted snorkel surveys beginning at the Wallowa-Whitman National Forest boundary and continuing upstream for approximately three miles. Brook trout and redband trout were the only species observed during these surveys. Eastern Oregon Power and Light Company, LLC (EOPL) conducted a fish survey in 2008 using electrofishing of Rock Creek as part of their Integrated Licensing Process study plan. Redband trout and brook trout were found in every reach of the survey. No other species were recorded. In 2016, a bull trout survey was conducted on the project reach of Rock Creek using eDNA sampling methods. Sampling was conducted every 250 meters from the powerhouse site upstream to the diversion site on September 8 and 9, during the early part of the bull trout spawning window. On September 30, 2017, the eDNA survey was repeated to include the period of the spawning window when 7DAM water temperatures were at or below 48° F, and the 7-day average water temperatures were at or below 46° F. Final eDNA sample analysis indicated no evidence for the presence of bull trout at any of

¹⁶ See Warm Springs Hydro, LLC April 1, 2019 Final License Application at 38.

the sites included in the 2016 and 2017 surveys. Oregon DFW indicated in its comments that native suckers are expected to be present in Rock Creek, and that Rock Creek would have historically supported anadromous fish such as Chinook salmon, steelhead, and Pacific Lamprey. However, redband trout and brook trout were the only fish species reported to be present in any of the fish surveys.

Aquatic Habitat

An aquatic habitat survey was conducted by EOLP along the 2.3-mile bypassed reach that extends from the diversion site to the powerhouse in September 2008. The bypassed reach surveyed during the 2008 aquatic inventory is the same as the current proposed bypassed reach (i.e. the reach from the diversion site downstream to the powerhouse discharge). The survey was conducted when stream flows were low, approximately 5.5 cfs to 6 cfs, and partitioned the bypassed reach into four separate reaches (figure 2). According to the survey, the stream bed has a high gradient throughout the project boundaries. Substrate throughout the bypassed reach is primarily cobble and boulder, and the habitat type is comprised mainly of rapids, riffles, and cascades. Table 4 summarizes the number of units evaluated (186 total units) in each reach and characteristics of each reach as reported by the 2008 habitat survey.

An Instream Flow Incremental Method (IFIM) study (EOLP, 2010; Craven Consulting, 2010) as reported by Warm Springs, shows the range of suitable spawning and juvenile rearing habitat for bull trout, and suitable juvenile rearing habitat for redband trout within the bypassed reach over a range of flows (tables 5 and 6). Warm Springs states that no redband spawning habitat is present in the bypassed reach, at any flow, due to a lack of suitable spawning substrate within the reach. Brook trout habitat was not discussed, likely because it is a non-native, invasive species in the Rock Creek system.

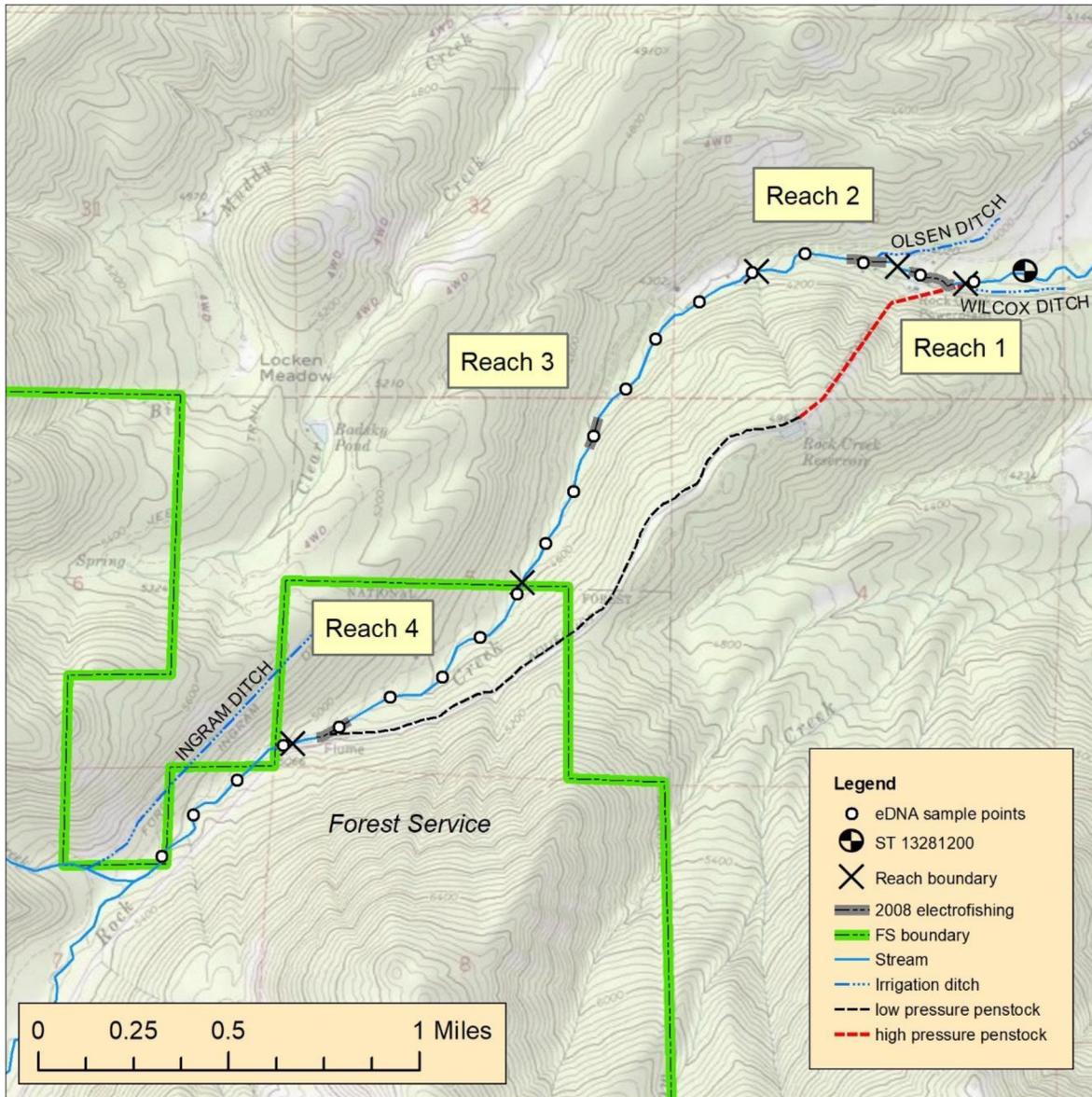


Figure 2. Reach designations for aquatic habitat survey, stream gauge location, 2008 electrofishing sites, and 2016 eDNA sample points (Source: Warm Springs, 2019).

Table 4. Summary of habitat characteristics by reach (Source: Warm Springs, 2019).

PARAMETER	REACH 1	REACH 2	REACH 3	REACH 4
Unit Numbers	1 to 19	20 to 50	51 to 139	140 to 186
Length (meters)	310	342	1819	1127
Constraints	Terraces	Multiple terraces	Alternating hillslope and terrace	Alternating hillslope and terrace
Valley Width Index	19	17	4.4	3.8
Land Use	Second growth timber, rural residential			
Average Channel Width (m)	7	6.8	9.8	11
Average Gradient (%)	4.1	4.4	6.8	10.1
Dominant Habitat	Rapids (62.8%)	Rapids (49.7%; riffles 31.2%)	Rapids (54.2%; cascades 29.4%)	Cascades (71.6%)
Wetted Width to Depth Ratio	17:05	16:09	18:05	15:07
Residual Average Pool Depth (m)	0.5	0.51	0.59	0.71
Stream Flow during Survey	Low flow	Low flow	Low flow	Low flow
Dominant Substrate	Cobble (56%)	Cobble (45%)	Cobble (60%)	Cobble 48%; boulders 39%)
Active Erosion (%)	6	5	1	1
Undercut Banks (%)	4	5	0	0
Pieces of Wood per 100 Meters of Stream	0	12.2	1.9	12.4
Volume (cubic meters) of Wood per 100 Meters of Stream	0	4.3	2.1	1.8

Table 5. IFIM predicted weighted useable area (square feet) in the Rock Creek bypassed reach (Source: Warm Springs, 2019).

FLOW	WETTED AREA	BULL TROUT SPAWNING	BULL TROUT JUVENILE	REDBAND SPAWNING	REDBAND JUVENILE
2	13,559	3,383	749	-	4,288
4	15,375	4,687	1,229	-	5,943
6	16,504	5,358	1,377	-	6,886
8	16,959	5,816	1,579	-	7,467
10	17,290	6,129	1,750	-	7,805
12	17,540	6,315	1,901	-	7,976
15	18,082	6,411	2,128	-	8,153
25	19,572	6,593	2,396	-	9,879
50	23,933	4,367	2,301	-	8,661

Table 6. Percentage of maximum IFIM habitat in the Rock Creek bypassed reach (Source: Warm Springs, 2019).

FLOW	WETTED AREA	BULL TROUT SPAWNING	BULL TROUT JUVENILE	REDBAND SPAWNING	REDBAND JUVENILE
2	69.3%	51.3%	31.3%	-	43.4%
4	78.6%	71.1%	51.3%	-	60.2%
6	84.3%	81.3%	57.5%	-	69.7%
8	86.7%	88.2%	65.9%	-	75.6%
10	88.3%	93.0%	73.0%	-	79.0%
12	89.6%	95.8%	79.3%	-	80.7%
15	92.4%	97.2%	88.8%	-	82.5%
25	100.0%	100.0%	100.0%	-	100.0%
50	122.3%	66.2%	96.0%	-	87.7%

Approximately 1.5 miles downstream of the project boundary, the stream enters Baker Valley where water is diverted for irrigation purposes. Consumptive water rights often dewater portions of the lower Rock Creek during peak irrigation season and Rock Creek is disconnected from the Powder River for several months during most summers.

3.3.3.2 Environmental Effects

Fish Community

The applicant did not address potential changes to fish communities in their FLA. Oregon DFW commented that effects to habitat in the bypassed reach should be evaluated to determine if such effects could give non-native, invasive brook trout a competitive advantage. Competition between redband trout and brook trout is discussed below under *Aquatic Habitat, Instream Flows and Habitat Mitigation*.

Aquatic Habitat

The construction of the new diversion structure and the resulting rise in water would create a small impoundment upstream of the structure converting the affected reach from cascade/boulder to pool habitat.

Fish Passage

Construction of the diversion structure would prohibit upstream and downstream passage for migratory fish, and the diversion of water from Rock Creek has the potential to cause fish to become entrained into the project pipeline and powerhouse. Warm Springs proposes to install fish passage as a part of the diversion structure to allow both upstream and downstream movement of fish past the diversion, and to install a fish screen to minimize entrainment through the project intake and turbine. Warm Springs proposes to design the fish passage facility in consultation with the Forest Service, FWS, and Oregon DFW. As proposed by Warm Springs, the upstream passage would consist of modifying the stream channel to create an approximately 6-foot-wide raceway below a notch in the weir wall. The raceway gradient would be sufficiently low to allow fish to swim up the raceway and jump across the weir through the notched section. Downstream passage would be accommodated by continuous flow over the weir.

Forest Service (4(e) condition 11) would require Warm Springs to develop a final fish passage plan in consultation with Oregon DFW and FWS that includes provisions for the design, construction, operation, and maintenance of fish passage facilities at the proposed diversion dam over the term of any license. Forest Service specifies that the upstream fish passage facilities must adhere to design criteria established by Oregon DFW,¹⁷ and the downstream fish passage facilities, including fish screens, must adhere to design criteria established by the National Marine Fisheries Service (NMFS) (NMFS, 2011).

¹⁷ OAR 635-412-0035

FWS (30(c) condition 13) and Oregon DFW (30(c) condition 2), also require the applicant, in coordination with Oregon DFW, FWS, and Forest Service, to design, construct, evaluate, operate, and maintain downstream and upstream fish passage facilities to provide for the safe, timely, and effective passage of native fishes, primarily redband trout. Downstream facilities would be required to include a fish screen as proposed by Warm Springs, designed to NFMS criteria, unless alternative criteria are approved by FWS and Oregon DFW, to prevent entrainment of fish into the project penstock and passage through the turbine.¹¹ The downstream facilities should also provide a safe and effective means to return fish to Rock Creek below the project diversion structure and provide for the uninterrupted passage of fish over the full range of flows for which the project operates. Upstream fish passage facility design must meet the criteria established by Oregon DFW unless alternative criteria are approved by FWS and Oregon DFW. Under these conditions, Warm Springs would be required to develop and implement a post-construction hydraulic evaluation plan, monitoring plan, and implementation schedule for upstream and downstream fish passage facilities in consultation with the Forest Service, FWS, and Oregon DFW. The plan would be required to include a: (1) short-term hydraulic evaluation that ensures the performance of the facilities is consistent with the design criteria, (2) a long-term monitoring plan and implementation schedule that ensures performance is maintained and design criteria are met throughout the license term, and (3) consultation with the Forest Service, FWS, and Oregon DFW if performance criteria are not being met.

Instream Flows and Habitat Mitigation

The amount of fish habitat would be reduced within the 2.3-mile bypassed reach whenever water is diverted for power generation. To minimize the loss of habitat, Warm Springs proposes to operate the project in run-of-river mode and implement a Minimum Flow Plan, which specifies the seasonal minimum flows that would be maintained in the bypassed reach (table 2). Warm Springs is also proposing to mitigate for habitat loss by completing a habitat improvement project under its Fishery Habitat Mitigation Plan, either on Rock Creek or elsewhere in the Powder River Basin. The plan is under development in coordination with stakeholders to identify a project that, together with the temperature benefit provided by cooler water being discharged back into the stream at the powerhouse, would result in no net loss of aquatic habitat.

The Forest Service's 4(e) condition 10 would require Warm Springs to revise and finalize the proposed Minimum Flow Plan (referred to as a Project Flow Operations Plan in the 4(e) condition) in consultation with FWS, Oregon DEQ, and Oregon DFW. The final plan would include minimum instream flows, ramping rates, and gauge installation and monitoring requirements. The minimum instream flow requirements are the same as those proposed by Warm Springs in the FLA and described in table 2 in section 3.3.2.2, *Water Resources, Environmental Effects*, above.

FWS (30(c) condition 4) and Oregon DFW (30(c) condition 3), which are virtually identical, would require measures that are also intended to minimize and mitigate effects of reduced flow in the bypassed reach. Under these conditions, Warm Springs would be required to operate the project in run-of-river mode, divert no more than 13 cfs for generation purposes, and provide a minimum instream flow that meets Oregon DFW's 1992 flow recommendations in IS 72194 (listed in table 7) until and unless mitigation is approved and completed for the loss of fish habitat. Under these conditions, Warm Springs would be permitted to implement lower minimum flows (see table 2) if mitigation for habitat loss is provided in lieu of the higher flows recommended by Oregon DFW in IS 72194. In this case, Warm Springs would be required to revise the Fishery Habitat Mitigation Plan in Appendix B of the FLA consistent with Oregon DFW Fish and Wildlife Habitat Mitigation Policy goals and objectives for Habitat Category 4, and to address: (1) impacts to juvenile and adult redband trout rearing and spawning habitats; (2) categories of acceptable mitigation projects; and (3) a description of proposed in-kind or out-of-kind, in-proximity or off-proximity mitigation projects.

Table 7. FWS and Oregon DFW recommended instream flows (Source: FWS, Appendix C; and Oregon DFW, Appendix D).

Month/Two Week Interval	Instream Flow (cfs)
January 1-15	9 cfs
January 16-31	9 cfs
February 1-15	9 cfs
February 16-28	15 cfs
March 1-15	20 cfs
March 16-31	20 cfs
April 1-15	20 cfs
April 16-30	20 cfs
May 1-15	20 cfs
May 16-31	20 cfs
June 1-15	20 cfs
June 16-30	15 cfs
July 1-15	12 cfs
July 16-31	12 cfs
August 1-15	9 cfs
August 16-31	9 cfs
September 1-15	9 cfs
September 16-30	9 cfs
October 1-15	9 cfs
October 16-31	9 cfs
November 1-15	9 cfs
November 16-30	9 cfs
December 1-15	9 cfs
December 16-31	9 cfs

Forest Service 4(e) condition 12 would require Warm Springs to revise its Fishery Habitat Mitigation Plan in consultation with FWS, Oregon DFW, Oregon DEQ, and Oregon WRD, to include: (1) additional site selection criteria that establish a preference for proximity, in kind, measures located on National Forest Service lands; (2) procedures for maintaining and monitoring effectiveness of mitigation sites over the term of any license, including selecting additional sites if necessary; and (3) procedures for reducing diversion of flow during circumstances of warm air temperature and low flow when the project is likely to cause an increase of water temperature of more than 0.5° F in the bypassed reach.¹⁸

Redband/Brook Trout Habitat Competition

Warm Springs states no competition for spawning habitat occurs between brook trout and redband trout because the project reach was determined to have no suitable redband spawning habitat and because these species spawn at different times of year. Additionally, juvenile redband trout will utilize shallow water not well tolerated by brook trout. Based on this analysis, Warm Springs inferred that reduced flow in the bypassed reach would increase redband juvenile habitat relative to brook trout juvenile habitat, indicating that project implication might create a slight competitive advantage for redband trout relative to brook trout.

In their comments, Oregon DFW disagreed with Warm Springs' assessment that no suitable redband spawning habitat exists within the reach due to a lack of suitable spawning substrate. Oregon DFW notes that Warm Springs' assessment ignores gravel that was observed within the reach because it reports dominant substrate as a percentage, which for all reaches is cobble or boulder. Additionally, young-of-year redband trout were observed during the fish habitat survey (EOLP, 2010), indicating that redband trout spawning occurs in the bypassed reach. Oregon DFW also disagreed with Warm Springs' assessment of habitat suitability index (HSI) curves for brook trout versus select life stages for bull trout and redband trout, stating that the HSI curves were not interpreted accurately. Therefore, the assessment of potential competition between brook trout and redband trout, indicating project operations may cause a slight benefit to redband trout, is not accurate. Oregon DFW states that the findings were based on "cherry-picked" HSI curves that were not agreed upon by the stakeholders within the IFIM framework of collaborative decision-making.

As discussed in section 3.3.2.2, *Water Quality, Environmental Effects*, WaterWatch provided comments, stating that Warm Springs' proposal does not include adequate flow monitoring and fails to adequately address irrigation withdraw requirements in its Minimum Flow Plan, and does not provide adequate detail on how it

¹⁸ The Aquatic Habitat Mitigation Plan (Forest Service 4(e) condition 12) refers to the Fishery Habitat Mitigation Plan in Appendix B of the FLA.

would adjust project operations if bypassed reach flows drop below the minimum flow. WaterWatch recommends that Warm Springs use telemetric gauging stations throughout the bypassed reach to provide real-time flow reporting capabilities.

Ramping Rates

FWS and Oregon DFW note that sudden flow changes can adversely impact fish and aquatic resources, with rapid flow reductions potentially resulting in the stranding of eggs, fry, or juvenile fish and that such an event at a critical life history timing can cause a significant limiting condition (injury or death) for one or more age classes of fish, or impact long-term habitat conditions within a reach. To minimize the potential for these adverse effects to redband trout, FWS (30(c) condition 5) and Oregon DFW (30(c) condition 5) would require Warm Springs to restrict any changes in flow in the project reach to a ramping rate of 1-inch per hour from May 1 to October 31 to protect larval redband trout, and from November 1 to April 30 to protect juvenile and adult rearing redband trout.

Bull Trout

Though bull trout are not currently believed to exist within Rock Creek, the system provides high quality bull trout habitat, and bull trout are present in neighboring basins such as the North Powder River, Indian Creek, Salmon Creek, and Wolf Creek. The FWS believes that because a possible bull trout/brook trout hybrid was collected in 1994, the habitat quality, and the presence of resident bull trout in neighboring basins, there is a chance that a predominately resident bull trout population has persisted in Upper Rock Creek. Therefore, FWS (30 (c) condition 17) and Oregon DFW (30 (c) condition 14) would require Warm Springs to document and report to the agencies if bull trout are observed within the project reach of Rock Creek.

Our Analysis

Fish Community

No evidence of potential impacts to fish communities was presented in either the FLA, or in comments provided by FWS, Forest Service, or Oregon DFW. As discussed in *Aquatic Habitat* below, effects of the project on fish habitat have been adequately considered and minimization and mitigation for those effects would minimize effects to fish communities as well.

Aquatic Habitat

Fish Passage

The impoundment resulting from the weir construction would alter upstream habitat by converting a short section of the stream from rapids/cascade type habitat to pool habitat. The resulting water level at the weir would range between 2.0 – 3.1 feet and extend upstream between 25 – 39 feet at flows ranging between 6 – 100 cfs, storing approximately 0.017 to 0.042 acre-feet of water. As proposed by Warm Springs and conditioned by Forest Service, FWS, and Oregon DFW, the project would operate in run-of-river mode. Because water level estimates are within the range of those that occur naturally during spring flows, and the extent of stream habitat affected by the impoundment is minimal, the modification of habitat type in that stretch is not likely to cause a substantial adverse effect to redband trout upstream of the weir. Additionally, because retention time is short at low-head dams operated in run-of-river mode, water temperatures are not likely to increase substantially within the impoundment created by the weir.

Construction of the diversion structure, which will include a low concrete weir, roller head gate, fish screen, and a pipeline intake structure, would create an artificial obstruction to upstream and downstream passage for redband trout, and potentially cause fish to become entrained into the project pipeline at the diversion site and subsequently into the project's power generating turbines. Warm Springs states in its FLA that fish entrained into the turbines would experience a high mortality rate. Fish passage facilities, including a fish screen at the downstream passage facility proposed by Warm Springs, with the revisions required by FWS and Oregon DFW, including adhering to NMFS and Oregon DFW design criteria, would minimize these effects.

Instream Flows and Habitat Mitigation

Diversion of water during power generation would reduce the amount of available fish habitat within the 2.3-mile project bypassed reach. To minimize the effects of reduced flow in the bypassed reach, Warm Springs proposes to operate the project in run-of-river mode at all times during power generation, meet minimum flow requirements before diverting water from Rock Creek, and ensure that any flow in excess of minimum flow plus 13 cfs would remain as instream flow. If at any time natural flow is equal to or less than the minimum flow requirements, operations would cease. Water would not be diverted for power generation until irrigation and minimum instream flow requirements are met.

Warm Springs evaluated potential aquatic habitat impacts caused by reduced flow in the bypassed reach based on the IFIM study (EOLP, 2010; Crave Consulting 2010). Table 5 shows the increase in total wetted area and weighted useable area for key bull

trout and redband trout life history elements as a function of increased flow. Table 6 shows the increased percentage of maximum IFIM habitat available in the Rock Creek bypassed reach as a function of increased flow. Gains in all habitat types are shown to be greatest as flow increases from 2 cfs to 4 cfs, exhibit smaller increases between 4 cfs and 25 cfs, and then begin to decrease above 25 cfs.

The project minimum flow proposal (table 2) would assure that bypassed reach flow is always maintained at or above 6 cfs, which achieves 81.3 percent of the maximum bull trout spawning habitat, 57.5 percent of the maximum bull trout juvenile rearing habitat, and 69.7 percent of the maximum redband juvenile habitat available based on the IFIM modeling. Warm Springs states that this would only be a slight reduction from existing conditions between mid-September to mid-March (which includes the bull trout spawning period) when flows in the reach are typically less than 10 cfs. Further, from about mid-April to mid-July habitat is nearly maximized (with or without the project) due to high seasonal flows. Thus, the main habitat impacts would occur from about mid-March to mid-April and from mid-July to mid-September (figure 3). The largest impact would affect late summer juvenile habitat, particularly for bull trout, which do not currently occur in the project reach of Rock Creek. We note however, that while redband trout spawning habitat was not discussed in the IFIM study report provided by Warm Springs, spawning typically occurs between March and June, potentially coinciding with the period of greatest habitat impacts.

If habitat loss mitigation is not provided, FWS and Oregon DFW 30(c) conditions (4 and 3, respectively) require Warm Springs to meet higher minimum flows (table 7), which are the minimum flows necessary to maintain salmonid populations at their current levels for the purposes of fish migration, spawning, egg incubation, fry emergence and juvenile rearing as determined by Oregon DFW (IS 72194).

The higher minimum instream flows recommended by the FWS and Oregon DFW would assure that the bypassed reach flow is always maintained at or above 9 cfs, which would achieve between 88.2 and 93.0 percent of the maximum bull trout spawning habitat (the percentage available habitat was not reported specifically for a flow of 9 cfs so we can only describe the amount as an available habitat range between 8 and 10 cfs), between 65.9 and 73.0 percent bull trout juvenile rearing habitat, and 75.6 and 79.0 percent redband trout juvenile rearing habitat. Under these recommendations, flows from March through mid-June would be a minimum of 20 cfs in the bypassed reach. At 15 cfs, bull trout spawning habitat increases to 97.2 percent of the maximum, bull trout juvenile reaches 88.8 percent, and redband juvenile rearing habitat is at 82.5 percent. One hundred percent of the maximum habitat available is reached at 25 cfs.

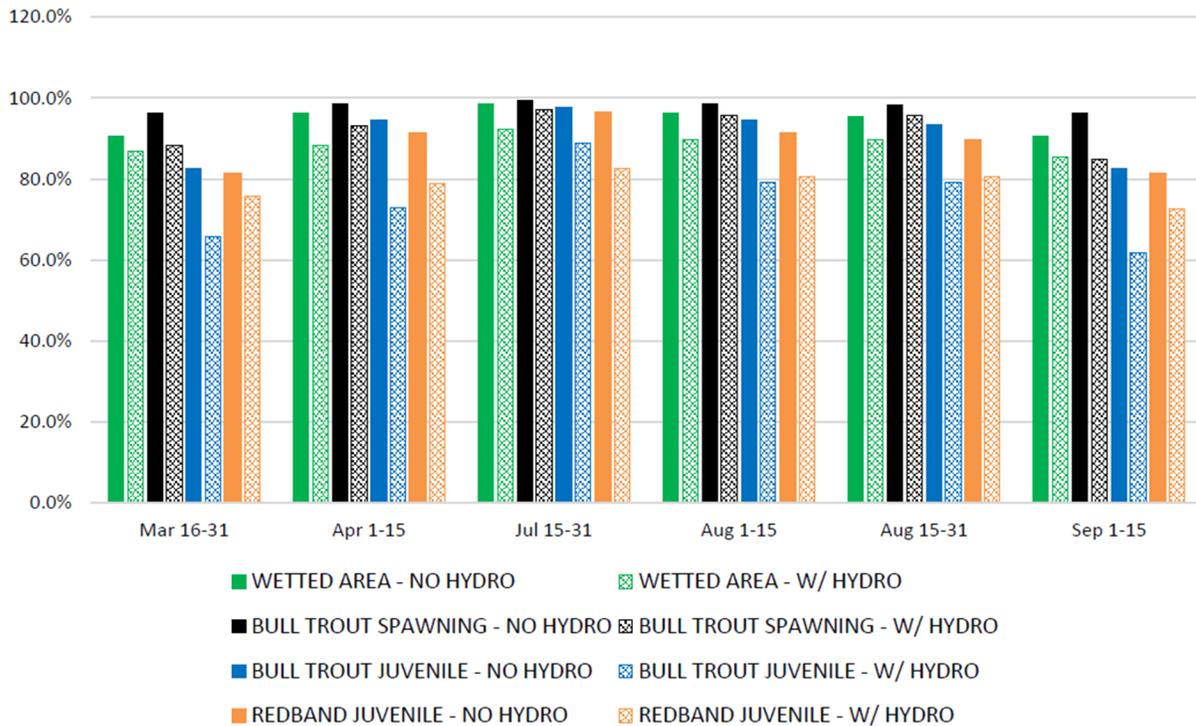


Figure 3. Comparison of IFIM predicted fishery habitat with and without the hydro project assuming the table 2 minimum flow schedule (Source: Warm Springs, 2019).

Under the FWS and Oregon DFW 30(c) conditions (4 and 3 respectively), minimum flow rate requirements would be lower after the habitat loss mitigation project(s) have been designed in consultation with stakeholders and completed. Though several types of projects have been proposed, no sites have been visited or fully evaluated and no habitat enhancement project has been chosen. Therefore, it is not possible to meaningfully evaluate the effectiveness any habitat enhancement project(s) would have offsetting or minimizing fish habitat loss resulting from reduced flows in the bypassed reach.

Oregon DFW commented that the project also has potential to have a direct effect on water temperature due to the reduction of flow through the bypassed reach. By withdrawing water from Rock Creek, a cold-water stream, the project is likely to cause a temperature increase in the water that remains in Rock Creek because the remaining water will have lower thermal mass. An increase in water temperature would affect fish habitat and could impact fish resources in multiple ways.

Redband Trout/Brook Trout Habitat Competition

Based on Warm Springs discussion of its IFIM study, no suitable redband trout spawning habitat is present in the project bypassed reach due to a lack of suitable

spawning substrate (gravel sized substrate). However, as noted by Oregon DFW, gravel made up 15, 24, 10, and 12 percent in reaches 1 through 4 respectively, and redband trout young-of-year were observed within the bypassed reach. In reach 2, the proportion of gravel substrate exceeded the proportion of boulder substrate, indicating there was a significant amount of gravel observed within the reach. Redband trout are known to be opportunistic spawners that can use small patches of suitably sized gravel to successfully spawn. Based on the information provided by Oregon DFW, redband spawning is likely to occur within the bypassed reach.

Oregon DFW disagreed with Warm Springs' analysis of HSI curves in its IFIM study that concluded project effects to habitat within the bypassed reach may give redband trout a slight competitive advantage over brook trout. However, they did not include any alternative analysis of the HSI data. Both species are known to exist within the bypassed reach and therefore, competition for resources likely exists. Competition for spawning habitat, however, is not likely since the two species spawn primarily at different times of the year. While project effects may impact the interaction between the non-native, invasive brook trout and the native redband trout, no evidence has been presented that indicates this would give a competitive advantage to either species.

Ramping Rates

As discussed in section 3.3.2.2, *Environmental Effects, Water Quantity, Our Analysis*, the proposed project is not expected to result in large or sudden fluctuations in downstream flow releases as proposed operation does not include plans for power peaking. We recognize that the development of ramping rates associated with initial construction, and any subsequent draining and refilling for maintenance purposes, of the project pool would help to minimize any effects on downstream aquatic resources resulting from sudden increases or decreases in flow. Therefore, maintaining minimum flows and implementing agency-recommended ramping rates associated with construction of the diversion weir and any start up or shut down activities would ensure any changes to flow do not adversely affect downstream aquatic resources.

Bull Trout

Although there is no evidence bull trout use the project reach during any life stages, Warm Springs assessed potential competition between bull trout and brook trout using HSI for each species (figure 4). Using the HSI curves, Warm Springs inferred that both spawning and juvenile brook trout can utilize deeper and faster water than the corresponding bull trout life stages, stating that hydropower diversion could increase competition for shallower water and slower water preferred by both species. However, the effect would not be significant since deeper water habitat used preferentially by brook trout juveniles is already limited in the project reach.

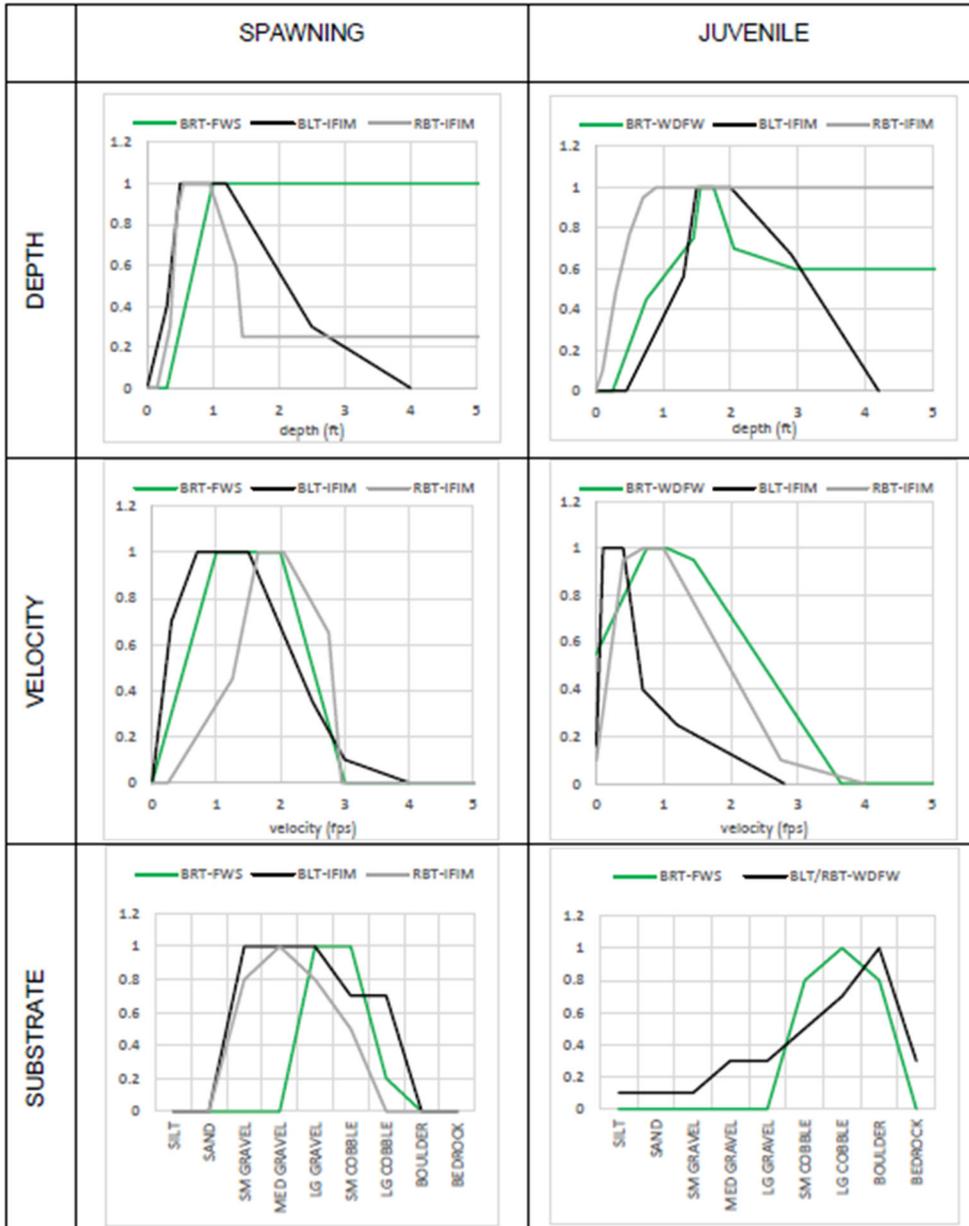


Figure 4. Comparison of literature-based brook trout (BRT) HSI to the HSI used in IFIM modeling for bull trout (BLT) and redband trout (RBT) (Source: Warm Springs, 2019).

3.3.3.3 Cumulative Effects

The proposed project would reduce streamflows within the project's bypassed reach during periods when water is diverted from the stream for power generation. Reduced flows within the bypassed reach would cause a reduction in available bull trout and redband trout habitat for all life stages. The proposed project would include the construction of a new diversion and intake structure resulting in an artificial obstruction

in Rock Creek that would also impede the movement of redband trout past the diversion structure. Sudden flow fluctuations (ramping) caused by the project operations can adversely impact fish at all life history stages (flushing fry downstream during up-ramping events or stranding fry, juveniles, or adults during down-ramping events for example).

Irrigation water withdrawals currently reduce streamflow within Rock Creek at points beginning upstream of the bypassed reach, within the reach, and downstream of the project reach typically between April and August, also causing a reduction of available fish habitat within Rock Creek. Reduced available fish habitat, sudden fluctuations in flow, and the obstruction of movement for migratory fish could individually reduce fish survival and contribute to cumulative impacts on fish populations within Rock Creek. However, minimum instream flows, ramping rate restrictions, and fish passage measures would adequately reduce the effects of the proposed project so that cumulative impacts are expected to be negligible.

3.3.4 Terrestrial Resources

3.3.4.1 Affected Environment

Vegetation

National Land Cover Database mapping shows that all proposed project facilities lie within the evergreen forest land cover type. In the Blue Mountains, these ecosystems are most frequently found as a mix of conifers commonly involving two or more of these species: Douglas fir, larch, ponderosa pine, lodgepole pine, and white fir. Mixed conifer stands have a structure that is reasonably consistent and usually quite diverse compared with relatively pure stands.

Comprehensive botanical surveys of the project area were conducted in 2008 and 2009. The surveys included all potentially disturbed areas on both public and private lands. An additional botanical survey was conducted in June 2016 targeting noxious weeds and special status plants on Forest Service lands potentially affected by construction of project facilities (the diversion site and a portion of the pipeline corridor). The most common species found in the project boundary during the surveys included: western yarrow, grand fir, Sitka alder, fireweed, woods strawberry, strawberry, western hawkweed, western larch, Oregon boxwood, ponderosa pine, sticky cinquefoil, Douglas fir, wild rose, red raspberry, spirea, and common mullein.

Riparian and Wetland Vegetation

A wetland delineation survey was conducted in 2009. No wetlands were found along the bypassed reach of Rock Creek, the high-pressure penstock corridor, or in the

vicinity of the new powerhouse. A spring and wetland area were found near the low-pressure penstock corridor.

The spring was located approximately 2,500 feet down the pipeline corridor from where it crosses Rock Creek, at the intersection of the low-pressure pipeline route with a prominent ravine. The spring is seasonal during and immediately following snow-melt; however, it continues to seep most of the summer and fall. Based upon inspections from May to September of 2009, it appears that the spring rarely flows above 20 gallons per minute (gpm), and never exceeds 100 gpm except during the spring snow-melt. Typical summer flows are 0.1 to 1.0 gpm. The spring emerges just above the excavated shelf where the original hydropower flume was located. It then flows across the shelf, over the edge, and continues down toward the bottom of the draw. Except during spring snow melt, the spring's water flow subsides into the ground within 100 yards of the shelf.

The width of the seep area at the bottom of the ravine ranged from about 5-10 feet, based on observations during the botanical survey conducted in June 2016. These observations were made in the vicinity of the proposed pipeline crossing. Vegetation within the seep area was observed to include sedge, horsetail, strawberry, bluebells, thimbleberry, false hellebore, and buttercup.

A second smaller ravine was observed about 1,700 feet down the pipeline corridor from the Rock Creek crossing, where the pipeline route intersects with a lesser topographic draw. No flowing water or seeps were observed at this location during the botanical survey. However, it is possible that water flows or seeps in this smaller ravine during the spring snowmelt period.

Non-native, Invasive Weed Species and Special-status Plants

A 2016 survey was conducted to look for noxious plant species within the portions of the project located on Forest Service land. A list of potential noxious weed species known or expected to occur adjacent to Wallowa-Whitman National Forest lands was obtained from the Forest Service. No noxious weed infestations were found during the 2016 survey or any of the previous botanical surveys.

The 2016 survey also focused on Forest Service special-status plant species within the portions of the project located on Forest Service land. A list of target species was developed through consultation with the Forest Service. No special-status plant populations were found during the 2016 survey or any of the previous botanical surveys.

Wildlife

There are 379 species of terrestrial vertebrate wildlife within the geographic area of the Wallowa-Whitman National Forest. These species include 10 amphibians, 16

reptiles, 263 birds and 90 mammals. Fifty-one of the bird species are migrant or incidental visitors only. The proposed project is located primarily in what the Forest Service considers the Grand fir- Douglas fir plant community, which provides habitat for 173 wildlife species (six amphibians, seven reptiles, 111 birds, and 49 mammals). Field studies of the project included incidental observations of wildlife. Species observed included ruffed grouse, turkey, Stellar's jay, common crow, bushy-tailed wood rat, coyote, red fox, black bear, long-tailed weasel, spotted skunk, bobcat, elk, mule deer, and white-tailed deer. The majority of eastern of the project pipeline and Rock Creek are located within deer and elk winter range as identified by Oregon DFW.

Rare, Special-Status, and Indicator Species

There are 25 Forest Service special-status species that are known to occur or have the potential to occur in the Wallowa-Whitman National Forest. Of these, one species is known to occur (the Inland Columbia Basin redband trout) within the project boundary, and seven have the potential to occur: pine grosbeak, broad-tailed hummingbird, Rocky Mountain tailed frog, gray wolf, Townsend's big-eared bat, fringed myotis, and Pacific fisher. The 1990 Forest Plan lists management indicator species to be Rocky Mountain elk, pileated woodpecker, goshawk, pine marten, primary cavity excavators,¹⁹ steelhead and resident trout.

A survey for Forest Service special-status amphibians was conducted in 2016. The objectives of the survey were to identify habitat suitable for special status amphibian species on Forest Service lands within the project boundary and, for any suitable habitat found, to investigate presence/absence of special status amphibians. The targeted amphibian species were Columbia spotted frog and Rocky Mountain tailed frog. No suitable habitat was found for Columbia spotted frog. The Rocky Mountain tailed frog prefers small, shaded, cold, fast-moving headwater streams with little aquatic vegetation and a rocky bottom with little silt. Rocky Mountain tailed frog habitat is often fishless. Although the project reach is slightly larger than typical Rocky Mountain tailed frog streams and contains several species of fish, Rock Creek has some of the characteristics necessary for inland tailed frog habitat. A presence/absence survey for inland tailed frog was performed by use of eDNA sampling methods. No eDNA evidence for Rocky Mountain tailed frog was found in any of the samples collected in 2016.

The FLA lists 16 species that Oregon DFW considers to be Sensitive and Conservation Strategy Species. Of these, only five could potentially occur in the proposed project area, including: pileated woodpecker, California myotis, hoary bat, long-legged myotis, and silver-haired bat.

¹⁹ Primary cavity excavators include pileated woodpecker, yellowbellied sapsucker, hairy woodpecker, downy woodpecker, black-capped chickadee, mountain chickadee, and chestnut-backed chickadee (Forest Service, 1990).

3.3.4.2 Environmental Effects

Vegetation

Construction

The overall project footprint, comprising all areas where vegetation would be disturbed, would be approximately 5.42 acres including facilities, staging areas, and construction buffer zones. Permanent facilities would occupy approximately 0.07 acres, consisting of the diversion/fish screen (0.02 acres), and the powerhouse (0.05 acres). The remaining 5.35 acres represents the pipeline corridor (4.07 acres), the transmission corridor (0.19 acres), staging areas (0.92 acres), and a construction buffer zone around the diversion (0.17 acres), all of which would be only temporarily disturbed.

Construction of the proposed penstock corridor would require the removal of 65 trees that have a diameter-at-breast-height (dbh) of greater than six inches on lands owned by the Forest Service. The species that would be removed are: cottonwood (1); Douglas fir (3); grand fir (24); lodgepole pine (20); Spruce (3); and western larch (14).

Construction of the diversion/fish screen and the first 75 feet of pipeline would require clearing of approximately 0.33 acres of forested land. The additional tree removal would be limited to the designated diversion staging area and a 15-foot buffer around the edge of the permanent facilities, allowing access for construction equipment. Tree removal would be minimized to maintain, as much as possible, an area of undisturbed forest to screen project facilities from the view of vehicles on Rock Creek Road. The 15-foot buffer area around permanent facilities would be maintained long-term for maintenance access.

Warm Springs proposes to implement a Revegetation Plan, filed under Appendix B of the FLA. Under this plan, Warm Springs proposes to minimize ground disturbance and the risk of introducing noxious weeds by using existing roads for access to all construction areas. All construction equipment would be washed to remove noxious weed seeds prior to entering the construction area and would stay on-site until construction is completed; any equipment removed from the site would be re-washed before re-entering the site. Areas of native vegetation would be preserved to the greatest extent possible and would be flagged prior to construction. Any weeds that would be introduced during construction would be removed in accordance with Forest Service-approved weed treatments.

The Revegetation Plan specifies that tree removal for the fish screen and diversion would be minimized, to the extent possible, to maintain a forested buffer to screen the project facilities from Rock Creek Road. All trees removed during construction would be transported to lands owned by Warm Springs. Depending on the final selection of a

fishery habitat mitigation project as part of its proposed Fishery Habitat Mitigation Plan, these trees would either be used for fishery habitat improvement or would be processed for use as lumber or firewood. The 15-foot buffer areas around permanent project facilities would be re-seeded with ground cover species and non-buffer areas would be pre-planted with small trees to promote regrowth of the forest. Noxious weed management would be conducted to minimize the introduction and spread of noxious weeds.

Warm Springs estimates that approximately 65 trees with six inches or greater dbh would need to be removed for the pipeline construction. This would mostly occur where the pipeline would traverse two ravines. The number of trees that would need to be removed may be reduced by updates to the pipeline design. These trees would also be removed from the project site in the same manner and purpose as the tree removal for the fish screen and diversion. Once the pipeline is buried, the corridor on Forest Service land would be re-seeded with ground cover species and maintained to prevent trees from becoming established for ease of access for maintenance.

All revegetation would utilize Oregon native seed mixes and plants in consultation with Forest Service. Seeding would take place as soon as possible post-construction and is projected to occur in late summer or fall after most major construction is completed, subject to conditions. Revegetation at the powerhouse may occur while construction continues since its construction would not require continued disturbance to adjacent lands.

Warm Springs would monitor revegetation sites for two years following completion of construction, and monitoring would occur during the peak growing season in midsummer. Monitoring sites would be photo-documented, and general species and abundance information would be collected, as well as observations of noxious weeds. The photographs would be included in a report compiled and submitted to Forest Service within one month of completing field operations. In the event the revegetation effort proves unsuccessful, Warm Springs would implement the following measures:

- Eliminate invasive noxious weeds in disturbed zones by localized use of approved herbicides;
- Re-seed or replant area with approved seed mixtures or trees; and
- Other adaptive measures that may be required as determined through consultation with Forest Service.

Forest Service (4(e) condition 8), FWS (30(c) condition 10)²⁰ and Oregon DFW (30(c) condition 8) would require that the proposed Revegetation Plan be revised to include additional measures to protect botanical resources in the project area. Forest Service would require the following measures on National Forest Service lands: (1) map all conifer and deciduous trees to be removed from the penstock right-of-way (ROW), the felled trees shall be used for penstock grade and soil erosion stabilization, and for large woody debris material on the forest floor adjacent to the penstock ROW; (2) seed the penstock ROW, including cut banks and out slopes, with Forest Service- approved native plant species, and monitor the penstock ROW for 3 consecutive years to determine whether the seeding meets 80 percent plant establishment; (3) reseed with approved native plant species and monitor for three more consecutive years if the 80 percent criteria is not met; (4) monitor (annually for the first 3 years post-license issuance, then once every other year in years 5, 7, and 9 with Forest Service making a determination for additional monitoring in year 10 for invasive plant presence at the diversion structure, penstock route, and all other project works where ground-disturbing activities occur on National Forest Service lands; and (5) implement BMPs specified by Forest Service to prevent the establishment and spread of invasive, non-native plants in the project area.

Forest Service BMPs include: (1) a cleaning program for equipment and vehicles that involves power spraying with water to remove seeds, plant material, soil, or mud; (2) inspect all equipment, including that used by subcontractors, to ensure that it is clean before it is allowed on project area job sites; (3) construction and maintenance activities shall be limited to sites that are small and as contained as possible to accomplish the activity at hand and, to the extent possible, these sites will be placed in areas that have been disturbed previously, or where the existing weeds have been treated; and (4) sand, gravel, and other fill or borrow material used for construction activities on Forest Service sites must be inspected by a District or Forest weed specialist and judged to be weed-free before use, and if weeds are found either treated or the contaminated layer excavated and set aside, or material may be taken from a fresh face.

FWS and Oregon DFW's conditions would require Warm Springs to revise the proposed Revegetation Plan to include the following measures, many of which were similar or over-lapping with those required by the Forest Service: (1) implementing appropriate, industry-standard BMPs to prevent the introduction and establishment of invasive plant species; (2) cleaning and inspection of construction equipment; (3) limiting construction activities to sites that are as small and contained as possible, with preference to sites that have been previously disturbed or treated for noxious weeds, to the extent possible; (4) ensuring materials used on Forest Service land are inspected by a District or

²⁰ The introductory paragraph for FWS's 30(c) condition 10 stated that the revised Revegetation Plan should "include measures A-E described below." However, FWS's condition listed nine measures, A-I, for inclusion in the revised Plan. Our interpretation is that the intent of the condition was to include all nine measures (A-I).

Forest weed specialist prior to use; (5) implementing noxious weed control measures and/or coordinating noxious weed control with appropriate resource agencies such as Forest Service, FWS, Oregon DFW, and ensure disturbed areas affected by the proposed project are appropriately treated for noxious weeds; (6) replanting all soils disturbed by construction using an approved seed mix or native plants approved by Forest Service, FWS, and Oregon DFW, ensuring that ground cover of disturbed areas meets or exceeds 80 percent in the undisturbed control area with similar vegetation and is adjacent to the proposed project area, and that species composition in disturbed areas equals or exceeds 75 percent non-woody species; (7) monitoring for noxious weed presence and revegetation efforts for 3 years post-construction and at various intervals thereafter²¹ on all lands in the proposed project boundary and buffer areas described in the proposed plan, including Forest Service Road #5520, diversion dam site and associated fish passage facilities, the 11,400-foot pipeline corridor, the new powerhouse site, and 500-foot transmission line corridor and interconnect site, with consultation after 10 years with the resource agencies to determine the necessity for continuing monitoring; and (8) consulting with stakeholders²² if revegetation requirements are not met within the 3 years post-construction to identify and implement measures including but not limited to, reseeded, additional mulch, soil amendments and supplemental irrigation to ensure establishment of vegetation where required.

Operation

The proposed project would result in reduced streamflow along 2.3-mile bypassed reach of Rock Creek. The general shape of the hydrograph, with high spring runoff decreasing to baseflow by late summer, would be unchanged and would continue to supply fish habitat and support riparian growth. IFIM results were used to estimate the project-induced change in wetted width during median flow conditions. The estimated maximum stream width change is -2.2 feet during April with an annual average change of -1.1 feet. This slightly reduced stream width would continue to sustain the narrow riparian fringe that currently exists on the streambanks but, over time, could shift the position of the riparian zone toward the stream channel in response to the new average annual stream width, or, more likely, the average stream width during the active growing season.

Riparian and Wetland Vegetation

²¹ FWS's condition requires twice annual monitoring (in the spring and fall) every third year thereafter (i.e., years 6, 9, and 12) following the initial three-year post-construction monitoring. Oregon DFW's condition requires monitoring every other year (i.e., years 5, 7, and 9) following the initial 3 years of post-construction monitoring.

²² FWS specified that the stakeholders would be FWS, Forest Service, and Oregon DFW.

The seasonal spring located where the pipeline crosses a topographic draw (about 2,500 feet from Rock Creek) would be spanned with an overhead pipe as a result of project construction. Pipe supports would be placed outside the seep area. A similar configuration would be used at the smaller topographic draw located about 1,700 feet from Rock Creek allowing undisturbed flow of water during spring runoff. The proposed pipeline design would avoid wetland disturbance. Adjacent upland areas disturbed by project construction would be mitigated under Revegetation Plan.

FWS (30(c) condition 18) and Oregon DFW (30(c) condition 15) require that within six months of any license issued for the project, and prior to any land-disturbing construction, Warm Springs shall consult with FWS, Forest Service, Oregon DFW, and Oregon DEQ for approval of locations and designs for construction of temporary stream crossings to be used during project construction activities, including but not limited to, pipeline construction.

FWS (30(c) condition 11) and Oregon DFW (30(c) condition 10) would require provisions for spring connectivity and protecting wetland habitat. Those conditions are discussed below under *Wildlife*.

Non-native, Invasive Weed and Special-status Plant Species

Construction of the project has the potential for introducing or spreading noxious weeds into native vegetation communities. No noxious weeds were observed during botanical surveys; however, invasive species may be introduced to the site during construction. Seeds and propagules of weed species could be transported on vehicles and other equipment and deposited in the project area and around equipment staging areas.

Our Analysis

Construction and operation of the proposed project would result in minimal loss of vegetation, with the exception of the tree removal for construction of the fish screen, diversion, and pipeline corridor, which could result in the loss of up to 65 trees with a dbh of six inches or more. Implementing the proposed Revegetation Plan, with the revisions required by Forest Service, FWS, and Oregon DFW, including reseeding and replanting with approved native seed mixes and plants, would minimize this effect.

Warm Springs' IFIM study results indicate that the proposed project would have minimal effects on wetland and riparian habitat, and that the slightly reduced stream channel may result in a net benefit of slightly increased riparian habitat in the project area. Consultation with Forest Service, FWS, and Oregon DFW on appropriate stream crossings prior to any land disturbance during construction would also minimize effects to these habitats, as well as protecting water quality and fisheries habitat.

The risk of the introduction and spread of invasive plants within the project area would be minimized by implementing the proposed Revegetation Plan, with the revisions required by Forest Service FWS, and Oregon DFW, including: requirements for cleaning and inspecting equipment for invasive plant material; ensuring all fill and borrow material are certified weed-free; using weed-free native seed mixes for revegetation; and monitoring.

Warm Springs proposes to monitor revegetated sites for two years post-construction; however, Forest Service, FWS, and Oregon DFW require an additional year of monitoring post-construction. In addition, Forest Service and Oregon DFW required monitoring every other year after that up to 10 years after construction is complete with the potential for additional monitoring after that if the revegetation efforts have not met specified performance criteria. However, FWS's conditions required twice annual monitoring (in the spring and fall) every third year after construction, with the same requirement to re-evaluate after 10 years to see if additional monitoring would be required. Monitoring every other year after the initial three-year post-construction monitoring period would seem the most efficient timescale rather than every three years, provided that the monitoring was done at the appropriate seasonal timeframe, such as the peak flowering season. Filing monitoring reports with the Commission in addition to Forest Service, as proposed by Warm Springs, would better enable us to enforce the requirements of any license issued for this project.

Wildlife

The primary potential adverse effect on wildlife would be vegetation disturbance, noise, and increased human activity during construction. Noise and human activity near active construction areas would likely displace wildlife into neighboring areas having similar habitat, which occur extensively throughout public and private lands surrounding the project. Short-term habitat losses totaling 5.35 acres (1.17 acres of native habitat and 4.18 acres of disturbed habitat) would temporarily decrease habitat available to wildlife, but revegetation of these areas would prevent long-term habitat losses.

An above ground wooden flume currently occupies much of the proposed pipeline corridor. This flume is a potential barrier for large animals, such as deer and elk, moving between Rock Creek and the forested habitat to the south and east. Under the project proposal, the flume would be removed completely from Forest Service land, which would provide a benefit for large animal movement in this area. The new pipeline would be completely buried except for an above ground crossing at Rock Creek and two above ground crossings over narrow ravines located about 1,700 feet and 2,500 feet from the Rock Creek crossing. Warm Springs states that these crossings would be sufficiently elevated to allow large mammals to pass underneath them.

Warm Springs states that Rocky Mountain elk and mule deer winter range would not be adversely affected since construction will occur during the summer months. Warm Springs believes that the removal of approximately 0.75 miles of wooden flume currently located on the Forest Service section of the pipeline corridor could benefit winter movement of deer and elk that use the project area.

In their additional information response, Warm Springs clarified proposed avian protection measures that would consist of designing poles to maintain conductor spacing and geometry for raptor protection as recommended in APLIC's *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996*. Warm Springs does not anticipate adverse effects to avian species due to the short length of the line and the proposed protection measures.

FWS (30(c) condition 8) and Oregon DFW (30(c) condition 9) would require Warm Springs to develop a Terrestrial Wildlife Resource Management Plan (TWRMP) in consultation with FWS, Oregon DFW, and the Forest Service. The TWRMP would include, at a minimum: (1) identifying the treatment of decadent trees, snags, and downed logs and timing of tree removal, which shall occur between August 1 and February 29, outside of active nesting periods (March 1 to July 30); (2) consultation with FWS, Oregon DFW, and Forest Service for tree disposal during construction; and, (3) measures to minimize adverse interactions between project activities and birds, including project construction, operation, and maintenance. FWS and Oregon DFW require that the TWRMP include provisions for power line construction and maintenance to occur outside the nesting season, and that all transmission lines be constructed to prevent accidental electrocution and provide safe bird perching. All new or rebuilt power poles would be constructed and maintained in accordance with the Avian Protection Plan Guidelines (APLIC and FWS 2005), which is intended to be used in conjunction with *Suggested Practices for Raptor Safety on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012). These standards should be applied to all transmission line upgrades.

FWS (30(c) condition 11) would require the TWRMP to include, in consultation with FWS, Forest Service, and Oregon DFW, provisions for spring connectivity and wetland impacts such as identifying locations to mitigate for the permanent loss of terrestrial, spring connectivity to Rock Creek, and wetland habitat associated with construction of the project, including the pipeline, resulting in no net loss of wetland habitat. Oregon DFW's 30(c) condition 10 is virtually identical and requires Warm Springs to develop a strategy to mitigate for any permanent loss or disturbance of wetland or spring habitat. Prior to any ground disturbing activities, Warm Springs would be required to delineate all wetland areas within the project boundary including the proposed pipeline route with elevated sections and associated footings. Warm Springs would also have to consult with Oregon DFW, Forest Service, and FWS to identify locations to mitigate for the permanent loss of wetland habitat associated with construction of the

tailrace channel resulting in no net loss of wetland habitat. Warm Springs would also be required to remove noxious weeds and re-vegetate the wetland mitigation site(s) consistent with the Revegetation Plan as described in Oregon DFW's 30(c) condition (8).

Our Analysis

Removing the wooden flume to restore a migration corridor for large mammals, constructing the project during the summer months to avoid migration of Rocky Mountain elk and mule deer to their winter habitats, and burying the proposed project pipeline, with exception of three above-ground portions that would be elevated to allow wildlife movement, would minimize effects to these species and result in a net benefit.

Developing and implementing a TWRMP would minimize project effects on wildlife. Requiring that tree removal occur outside of the nesting season for birds would avoid effects to birds and their nests during this critical life stage. Designing and constructing the transmission line to the most current avian protection standards, as would be required by FWS and Oregon DFW's TWRMP, in addition to the relatively short length of the line, would ensure that the risk to avian species is minimized.

A wetland delineation study was conducted in 2009, and the springs and wetlands in the project area were found near the proposed low-pressure penstock location. FWS's 30(c) condition 11 would provide an updated delineation study to show whether any changes have occurred since the last survey, and whether wetland areas would be affected by the construction of the project. FWS and Oregon DFW's 30(c) conditions (11 and 10, respectively) state that Warm Springs' current proposal for design and construction of proposed pipeline would not affect wetland areas. However, if the proposal changes such that the current proposed pipeline design and construction activity do not occur, the agencies' conditions would then require that locations be identified to mitigate for the permanent loss of wetland habitat associated with construction. It appears that FWS and Oregon DFW have the same intent in framing their conditions, however, Oregon DFW cite permanent loss of wetland habitat in the tailrace channel. A wetland delineation study was conducted in the project area in 2009, and found that no wetlands would be affected by the proposed project. Therefore, wetland mitigation for the current proposal would not be necessary. We note that if Warm Springs' proposal, including pipeline design and construction, changes during the licensing process, or after a license is issued for the license, under the current proposal, an amendment to the application or the license would be required, during which time the mitigation required by FWS and Oregon DFW's conditions may be required.

3.3.5 Threatened and Endangered Species

3.3.5.1 Affected Environment

Threatened and endangered species include those species listed as endangered or threatened and those species that have been proposed for listing or are candidates for listing under the ESA. Warm Springs' application identified such species that are known to occur or may occur within the proposed project area.

Federally listed species include the endangered gray wolf (*Canis lupus*), the threatened bull trout (*Salvelinus confluentus*), and the candidate species, Whitebark pine (*Pinus albicaulis*). There are no critical habitats in the project area for these species.

On June 10, 2020, staff accessed the FWS IPaC website to determine if additional federally listed species potentially occur in the proposed project area (FERC, 2020).²³ The IPaC database confirmed the species list compiled by Warm Springs, and no additional species were included.

Gray Wolf

The gray wolf was designated as federally threatened under ESA on March 9, 1978. Gray wolves are habitat generalists and will inhabit territories where prey is abundant. Common prey species include elk, deer, or moose. Wolves are opportunistic and will also prey upon small mammals such as rabbits, grouse, skunks, porcupine, beavers, or coyotes and fish. Pack boundaries vary from year to year, depending on prey availability, but may range from 25 to 1,000 square miles (Oregon DFW, no date).

Warm Springs states in the FLA that the gray wolf was delisted within the Northern Rocky Mountain Gray Wolf Population Area, which includes the proposed project area, in 2011. Gray wolves are listed as federally endangered under the ESA in western Oregon but are not federally protected in the proposed project area. It is noted

²³ We note that the IPaC lists by both Warm Springs and Commission staff include the gray wolf. However, Warm Springs' FLA states, and FWS's Environmental Conservation Online System results for Baker County, Oregon (<https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=41001>), confirm, the gray wolves in the project area are included in the Northern Rocky Mountain Distinct Population Segment, which was delisted in 2011. As such, a "no effect" call is warranted; however, due to conflicting information, we will request confirmation from FWS that the inclusion of gray wolf in the IPaC listing for the project area is incorrect.

that, while wolves are not currently present in the project area, they could be present in the future as wolves recolonize the area.

Bull Trout

All populations of bull trout within the coterminous United States were listed as a threatened species in November 1999.²⁴ The most recent critical habitat designation revision for bull trout was completed in 2010.²⁵ Bull trout, grouped with char in the salmonid family, are a cold-water fish that require relatively pristine lake and stream environments and require colder water temperature than most salmonids. They require clean stream substrates for spawning and rearing, and need complex habitats, including streams with riffles and deep pools, undercut banks, and high densities of large woody debris.

The size and age of bull trout at maturity is dependent on their life history strategy, where resident fish tend to be smaller than migratory fish and produce fewer eggs. Bull trout typically reach sexual maturity in four to seven years and may live longer than 12 years. Spawning for this species tends to occur from late July through December, with peak spawning occurring in September for most interior populations, and late October for most coastal populations. Eggs may take up to 210 days from incubation to emergence of fry from spawning gravel. Juvenile migratory bull trout rear one to four years in their natal stream before migrating to either a river, lake/reservoir, or nearshore marine area to mature.

The primary threats to the survival of bull trout are habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, the effects of climate change, and past fisheries practices. The introduction of non-native species such as brown, lake, and brook trout are among those management actions that have contributed to the decline in bull trout populations. Once found in approximately 60 percent of the Columbia River Basin, bull trout have been reduced in range to less than half of their historic range, with scattered populations remaining in portions of Oregon, Washington, Nevada, Idaho, and Montana. They have been completely extirpated from California (FWS, 2015).

Warm Springs indicates in the FLA that no bull trout were found during any of multiple surveys conducted in Rock Creek, including within the project bypassed reach. However, the applicant notes in its FLA that a comprehensive survey of the watershed has not been performed and therefore, the presence or absence of bull trout within the watershed cannot be definitively determined.

²⁴ 64 Fed. Reg. 58,910.

²⁵ 75 Fed. Reg. 63,898.

Whitebark Pine

Whitebark pine is a candidate for listing as threatened or endangered under the ESA.²⁶ Whitebark pine occurs in scattered areas of the warm and dry Great Basin but it typically occurs on cold and windy high-elevation or high-latitude sites in western North America. Its range extends longitudinally between 107 and 128 degrees west and latitudinally between 27 and 55 degrees north. The distribution of whitebark pine includes coastal and Rocky Mountain ranges that are connected by scattered populations in northeastern Washington and southeastern British Columbia. Isolated stands of whitebark pine are known from the Blue and Wallowa Mountains in northeastern Oregon and the subalpine and montane zones of mountains in northeastern California, south-central Oregon, and northern Nevada. In general, the upper elevational limits of whitebark pine decrease with increasing latitude throughout its range. The elevational limit of the species ranges from approximately 2,950 feet at its northern limit in British Columbia up to 12,000 feet in the Sierra Nevada. Whitebark pine is typically found growing at alpine timberline or with other high mountain conifers just below the timberline and down to the upper montane zone. Roughly 44 percent of the species' range occurs in the United States, with the remaining 56 percent of its range occurring in British Columbia and Alberta, Canada. In the United States, approximately 96 percent of land where the species occurs is federally owned or managed. The majority is located on Forest Service lands, approximately 81 percent, or 11,609,969 acres (FWS, 2016).

No whitebark pines were recorded during botanical surveys conducted in the project area in 2016.

3.3.5.2 Environmental Effects

Warm Springs proposes no environmental measures specific to threatened and endangered plant or wildlife species.

Gray Wolf

Warm Springs does not propose measures to protect gray wolf.

Our Analysis

Gray wolves were not observed during the field surveys for the project. However, elk and mule deer, the main prey of gray wolves, are present in the area. Measures proposed by Warm Springs, such as removing the wooden flume from the original project which serves as a barrier to movement, and elevating the sections of the proposed

²⁶ 81 Fed. Reg. 87,246 (2016).

pipeline that would not be buried to facilitate movement of large mammals through the project area, may increase the likelihood of these species moving through the project area, which may also attract wolves. Warm Springs proposes to construct the project during the summer months to avoid, in part, disturbing elk and deer migrating to winter habitat. Construction of the proposed project would not affect gray wolves. Although operation and maintenance of the project may affect gray wolves in the Northern Rocky Mountain Gray Wolf Population Area, it would not affect federally-listed populations.

Bull Trout

Warm Springs proposes to provide minimum flows and operate the project in run-of-river mode to protect aquatic habitat in the 2.3-mile bypassed reach. The measures would minimize effects to bull trout spawning habitat, and juvenile and adult rearing habitats. These measures, while helping to protect bull trout habitat, are intended to protect redband trout habitat.

Our Analysis

While Rock Creek provides high quality habitat suitable for bull trout spawning, and juvenile and adult rearing, no evidence has been found that indicates bull trout are present in the project area of Rock Creek since 1994 when a fish was observed during a fish population survey that was noted as a potential bull trout or bull trout/brook trout hybrid. The species of the fish was not verified by genetic analysis. Numerous fish population studies that included snorkel surveys, electroshocking, and eDNA analysis have failed to identify bull trout in Rock Creek since the 1994 observation. We conclude that bull trout are not present within the project area of Rock Creek. Therefore, the project would have no effect on bull trout.

Whitebark Pine

Warm Springs did not propose any measures for whitebark pine.

Our Analysis

The project is located within the elevational range of whitebark pines where this species is known to occur. However, whitebark pines were not documented during botanical surveys conducted in the project area in 2016 and is not one of the designated tree species that would be removed for the purposes of project construction. Therefore, the project would have no effect on the whitebark pine.

3.3.6 Recreation Resources

3.3.6.1 Affected Environment

Recreation Facilities

There are no recreation facilities within the proposed project boundary. The lower 1.6 miles of the project reach of Rock Creek, the lower 1.4 miles of the project penstock corridor, and the entire powerhouse site would be located on private lands. The upper 0.7 miles of the project reach of Rock Creek, the upper 0.8 miles of the project penstock corridor, and the entire diversion site would be located on Forest Service lands as part of the Wallowa-Whitman National Forest. The Forest Service portion of the penstock corridor cannot be accessed by any road or trail. The diversion site and the Forest Service portion of the Rock Creek corridor are accessible from Rock Creek Road. New project hydroelectric facilities would be constructed in the same location as a previous hydroelectric plant that operated on Rock Creek from 1904 to 1995.

The nearest areas with developed recreation facilities are the Anthony Lakes area, approximately 10 miles to the north, and the Phillips Lake area, approximately 15 miles to the south. The Anthony Lakes area offers both National Forest and private camping facilities as well as alpine skiing and groomed Nordic ski trails. The Phillips Lake area offers National Forest and private camping facilities as well as boat launch facilities.

Recreation Use

Regional recreation resources in the vicinity of the proposed project are primarily associated with the Wallowa-Whitman National Forest. The Wallowa-Whitman Forest Management Plan emphasizes opportunities for dispersed semi-primitive recreation activities in the Rock Creek basin, with most recreation occurring within the relatively high elevation areas where open meadows and small lakes attract visitors to the forest. The upper Rock Creek basin is accessed largely by trail with some trails open to motorized use. Common recreation activities include viewing scenery, hunting, fishing, observing wildlife, snowshoeing, cross-country skiing, camping, ATV riding, snowmobiling, hiking, backpacking, and gathering forest products. Two trailheads are located along Rock Creek above the project reach. Each trailhead has parking for one to three vehicles and no other facilities. Trails provide access into the upper basin and Killamacue and Rock Creek Lakes.

Fishing and big game hunting occur in the vicinity of the proposed project. Anglers primarily utilize the area above the project bypassed reach at Eilbertson Meadow, and the upper basin lakes. Some fishing occurs downstream of the bypassed reach and at the South Rock Creek Lane bridge. The bypassed reach itself is difficult to access from the road and contains numerous woody debris and rapids. Big game hunting

may be the most popular recreation activity in the Rock Creek basin, and vehicle traffic on Rock Creek Road has been observed to increase during hunting season as hunters utilize the road to access adjacent National Forest lands. Archery season begins in late August, and firearm season begins in mid-October.

Evidence of periodic camping has been observed at a few small sites along Rock Creek Road. These sites consist of small single-vehicle pull-offs that are limited in size due to the steep terrain.

3.3.6.2 Environmental Effects

Warm Springs neither proposed, nor have any other entities recommended, specific measures for protection or enhancement of recreational resources.

Our Analysis

The rough access road, the presence of steep terrain between the road and the stream, and the lack of any permanent recreation facilities keep recreation use along the Rock Creek Road corridor at a low level. Although there is evidence of roadside camping along Rock Creek Road, the sites are small and poorly situated due to the topography and receive limited recreation use.

There are no existing recreation uses of the private land within the proposed project boundary and there are minimal dispersed recreation uses of the Forest Service lands within the proposed project boundary. Warm Springs is not proposing, and no party has recommended, any measures related to recreation resources as part of this project. Proposed project facilities would occupy essentially the same footprint as the existing, currently decommissioned facilities, and the presence of these facilities, once refurbished, would not affect recreation resources. Project operation would, similarly, not have any significant effects on recreation resources in the vicinity of the project.

During periods of project construction, travelers going to nearby recreation sites could be temporarily impacted by slight increases in traffic due to construction vehicle travel along Rock Creek Road. Project construction would take place in the summer, outside of the most popular big game hunting seasons. Any construction-related traffic impacts would be expected to be minor and would not affect the traveler's recreation experience at their final destination.

3.3.7 Land Use and Aesthetic Resources

3.3.7.1 Affected Environment

Land Use

Project facilities would be located on private lands and on Forest Service lands. The lower 1.6 miles of the project reach of Rock Creek, the lower 1.4 miles of the project penstock corridor, and the entire powerhouse site would be located on private lands. The upper 0.7 miles of the project reach of Rock Creek, the upper 0.8 miles of the project penstock corridor, and the entire diversion site are located on Forest Service lands as part of the Wallowa-Whitman National Forest. There are existing facilities related to the previously hydroelectric plant that operated on Rock Creek from 1904 to 1995, and these facilities would be refurbished or replaced in a similar configuration.

Aesthetic Resources

The visual setting of the project is characterized by the geologic features of Rock Creek Canyon. The overall characteristic of this landscape is best described as rugged, mountainous, and undeveloped. New project hydroelectric facilities would be constructed in the same locations as a previous hydroelectric plant that operated on Rock Creek from 1904 to 1995. The previously operational hydroelectric facilities still exist and would be replaced or refurbished.

3.3.7.2 Environmental Effects

Land Use

Project facilities would be located where there are currently non-operational hydroelectric generating facilities on private lands and Forest Service lands. These facilities would be replaced or refurbished, and project operation would involve ongoing maintenance. Warm Springs proposes no land use measures.

Forest Service (4(e) condition 13) would require Warm Springs to develop a fire and fuels management plan in consultation with appropriate state and local fire agencies. The plan would detail Warm Springs' responsibility for the prevention, reporting, and emergency response to fires in the vicinity of the project resulting from project operations.

Our Analysis

The project would not significantly affect land use in the project area. The existing facilities from the previously operational hydroelectric plant would be

refurbished or replaced in the same configuration, and, therefore, there would be little noticeable change to the land use in the area. Project construction and operation would potentially provide a benefit, because the existing facilities would receive maintenance instead of being left idle.

Forest Service (4(e) condition 13) requiring the development of a fire and fuels management plan is a reasonable measure for the prevention, reporting, and emergency response to fires at and adjacent to the proposed project. Implementing a fire prevention plan, as specified by Forest Service, would help prevent potential fires from spreading beyond project lands, and would aid county and agency personnel if a fire were to move beyond the project boundary.

Aesthetics

Warm Springs' proposes to refurbish or replace existing hydroelectric generation facilities. These existing facilities were operational from 1904 to 1995 and are currently idle. Project operation would involve the resumption of ongoing maintenance at these sites. Warm Springs proposes to minimize construction-related tree removal in order to maintain an area of undisturbed forest that would provide a visual screen of project facilities from viewers driving on Rock Creek Road. Warm Springs proposes no other aesthetic resources measures, and no other entity has recommended any measures related to aesthetic resources.

Our Analysis

Short-term visual and noise effects would be caused by construction traffic on Rock Creek Road. Project construction, operation, and maintenance activities would be evident to the public, but would cause only minimal and temporary visual effects to aesthetic quality of the project area. Construction activities would be evident to the public for short durations of time, or as project vehicles travel on Rock Creek Road. Visual effects would result from construction, operation, and maintenance activities producing traffic and dust on roadways; however, these effects would be temporary and minor. To mitigate these effects, Warm Springs proposes to minimize construction-related tree removal in order to provide a visual screen of project facilities from viewers travelling on Rock Creek Road. Project construction and maintenance activities could also improve the aesthetic characteristics of the existing facilities by repairing any unsightly deterioration that has occurred over time and by providing ongoing routine maintenance to facilities that would otherwise remain idle.

3.3.8 Cultural Resources

3.3.8.1 Affected Environment

Section 106 of the NHPA (Section 106) requires the Commission to take into account the effects of licensing a hydropower project on properties listed or eligible for listing in the National Register and allow the Advisory Council on Historic Preservation (Advisory Council) a reasonable opportunity to comment if any adverse effects on historic properties are identified within the project's APE.

Historic properties are defined as any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. In this document, we also use the term "cultural resources" to include properties that have not been evaluated for eligibility for listing in the National Register. In most cases, cultural resources less than 50 years old are not considered eligible for the National Register. Cultural resources need enough internal contextual integrity to be considered historic properties. For example, dilapidated structures or heavily disturbed archaeological sites may not have enough contextual integrity to be considered eligible. Traditional cultural properties (TCPs) are a type of historic property eligible for listing in the National Register because of their association with cultural practices or beliefs of a living community that: (1) are rooted in that community's history or (2) are important in maintaining the continuing cultural identity of the community (Parker and King, 1998). Section 106 also requires that the Commission seek concurrence with the SHPO on any finding involving effects or no effects on historic properties. If TCPs have been identified, section 106 also requires that the Commission consult with interested Native American tribes that might attach religious or cultural significance to such properties.

If existing or potential adverse effects have been identified on historic properties, license applicants need to develop a HPMP to seek to avoid, reduce, or mitigate the effects. Potential effects that may be associated with a hydroelectric project include any project-related effects associated with construction, or the day-to-day operations and maintenance of the project after issuance of an original license.

3.3.8.1.1 Cultural Historic Overview²⁷

Native American

As part of the systematic study of the people who lived in the general area, archaeologists have separated the peoples and cultures using a system of three time

²⁷ This section was taken from pages 14-18 of the Cultural Resources report for the proposed project (Gray, 2018).

periods, which are then subdivided into phases. The Early Period (11,250-6000/4000 Before Present (B.P.)) people left only a few Clovis-style projectile points. The Windust phase of this period came to an end as Clovis (and Clovis-like points) gave way to Folsom and lanceolate, bipointed projectile points of the Cascade phase, the final cultural tradition of the Early Period the (8,000-4,500 B.P.) (Galm, 1998). The Middle Period of occupancy ranged from 6,000/4,000 – 2,500/2,000 years B.P. Peoples of this period left greater evidence of their lives on the land. The earliest phase of this period, the Tucannon phase was thought to begin around 5,000 B.P. but may have started as much as 1,000 years earlier. This phase is marked by broad changes to adaptive strategies and lifeways as activities began to occur off-river. Peoples of this Period used corner-notched and stemmed projectile points, some chipped knives and edge-flaked cobbles. Ground stone was used to make hopper mortars, pestles and net sinkers. Their diet included elk, deer and antelope along with salmon and waterfowl from the rivers. Semi-subterranean pit houses have been excavated with radiocarbon dates between 5,200 and 4,400 B.P. Downstream near Lewiston, Idaho, the Hatwai site has one pit house with an earlier date of 6,387 B. P. These houses are 7-8 meters across and one to two meters deep. Some have earthen annular benches around the interior circumference. On their floors were found hopper mortar bases and anvils. Other artifacts found in the Hatwai excavation (10NP146/147) include Hatwai-eared projectile points, a carved pipe, bone beads, and a grooved pendant (Fiedel, 1992; Galm, 1998; Walker, 1998).

The Late Period (2,500/2,000 - 250 years B. P.) is divided into three phases: Harder phase, Piquin phase and the later Numipu phase. During the Harder phase, villages were composed of large pit houses with diameters of 6 to 12 meters. Diet included not only salmon, elk, deer, and antelope, but mountain sheep as well. Hunting was conducted at first with atlatls, but these were replaced by the bow and arrows using smaller, corner-notched projectile points (Sprague, 1998; Walker, 1998). Around 500 years B. P. there was a change in social organization that marked the start of the Piquin phase. Villages from this period consisted of circular pit houses around 5.5 meters. Because more data has survived from this period, it is known that these people subsisted on elk, deer and salmon along with plant-based foods processed using mortars and pestles, and pounding stones. The proto-historic Numipu phase marks the presence of European trade goods and the introduction of the horse. These artifacts have been found in burials from this phase (Fiedel, 1992; Sprague, 1998; Walker, 1998). The western portions of the Wallowa-Whitman National Forest are within lands traditionally held by the Cayuse tribe. However, Baker Valley was known to have been shared seasonally by several tribes: Cayuse, Umatilla, Walla Walla, and the Nez Perce peoples of the southern Plateau. The tribes were known to interact, especially during the annual salmon runs. When the Paiute peoples of the northern Great Basin obtained horses in the 1700, they also made episodic incursions into the Baker Valley (Montgomery, et al. 2001). The Sahaptin-speaking Nez Perce were centered on the Salmon, Clearwater, and Snake rivers. For thousands of years, the Nez Perce peoples lived and made use of the plateaus, prairies, and canyons of the Snake River and its major tributaries such as Powder River.

Nez Perce earth lodges on the lower Snake have been dated to 3,000 B. C. Their annual subsistence cycle focused on the river and stream systems of the area. In warmer seasons, the villages would break up into traveling family groups to seek out resources such as root crops, mammals and anadromous fish. During salmon runs, large numbers of fish would be netted or speared and preserved. Family-groups would collect and process camas roots along with berries for winter use. As a result, cultural sites have been recorded along upper terraces of river drainages, as well as upland areas in the foothills and ridges. The greatest potential for complex sites exists along major water resources. In the winter, permanent and semi-permanent villages of five to ten earth lodges were built in sheltered canyons (Spier, 1936; Fiedel 1992; Sprague, 1998; Walker, 1998).

Euro-American

The first Euro-Americans to pass through the north end of the Baker Valley was in 1811, with fur trappers Wilson Price Hunt and his men of the John Jacob Astor's American Fur Company. They were followed by Canadian fur trappers of the North West Company and then Hudson's Bay Company. By the 1820s, fur trappers from the U.S. began to pass through the area trapping beaver and other fur-bearing animals. Trails were established through the valley and across the Blue Mountains to connect the Snake River region of Idaho with Oregon's Columbia River (Gray, 2012). In 1834 and 1836, American missionaries Jason Lee and then Henry Spaulding and Marcus Whitman passed through the valley on their way to establish missions in the newly established Oregon Territory. Their wives, Eliza Hart Spaulding and Narcissa Whitman were the first Euro-American women to pass through the Baker Valley (Gray, 2012). In 1840, Robert Newell and Joseph Meek, unemployed trappers, managed to take three wagons over the Blue Mountains to Whitman's Mission. These were the first wheeled vehicles to pass over the Oregon Trail. The next year, a portion of the Bartleson-Bidwell Party followed Newell and Meek's "road" into Oregon. The first great migration along the trail was in 1842, when over 100 persons set out from Elm Grove, Missouri and used the trail to cross into Oregon. The next year an estimated 700 to 1000 pioneers passed through the valley on the way to Oregon. Thereafter, the numbers increased dramatically until 1849 when much of the trail's traffic diverted to the California gold fields.

Travelers again increased until 1854 when Indian depredations and the 1855 opening of the Panama railroad effectively closed down the route. In all, it was estimated that over 400,000 people traveled the Oregon Trail. Though the construction of transcontinental railroads became the preferred method of travel after 1869, the Oregon Trail was in use from 1861 to the 1890s as traffic reversed direction with miners heading to the gold fields of Auburn and Sumpter, Oregon and eastward into Idaho. In the 20th Century, much of the route was incorporated into State Highway 30 and later into Interstate 84 (Gray, 2012). In the 1860s, miners and farmers began to settle in the northern Baker Valley. The area provided food and timber for the miners in the

mountains west of the valley. In 1884, the Oregon Railway and Navigation Company railroad was constructed through the valley and a depot was established at Haines. This railroad connected with the Oregon Short Line Railroad, a subsidiary of the Union Pacific Railroad, at Huntington, Oregon. The depot and town site of Haines was on 120 acres of land donated by Israel David Haines, a prominent local farmer, lawyer and two-time Senator from Baker City. The town became a livestock shipping center for cattle and hogs and also shipped hay, lumber, and grain. It was incorporated in 1910 and boasted a post office, opera house, bank, school, two churches, and five saloons. An early Mercantile was operated by the Wilcox family, who were prominent local farmers. The completion of the paved State Highway 30 brought the gradual decline in Haines. Located only 12 miles from Baker City, it was a relatively short drive for improved services. The town now serves an agricultural-based community with some tourist services for those traveling the scenic route through eastern Oregon.

The Rock Creek Power Plant was completed in 1904. It provided Baker City with its first electric lights. Though it was a technological marvel of its day, it only had a peak summer production of 800 kilowatts of electricity. While this was more than adequate for 1904, the plant became a minor producer when Baker was connected to electrical grids that included the Hells Canyon Dams (Robinson, 2004). The plant sits on a 58-acre property. The plant was supplied with water from Rock Creek. This mountain stream has a minimum flow of 2,500 cubic-feet-per minute, but in flood can reach 20,000-feet-per-minute. The supply system consisted of 1.5 miles of wood flume, a hill-top reservoir and a 4,020-foot-long penstock. The water was delivered to a Pelton-wheel generator in a stone powerhouse at the base of the penstock. While the powerhouse and support buildings were constructed of local materials, the equipment was manufactured in San Francisco, California (EW&E, 1904; Schoeningh, 2003; Robinson, 2004). The plant was developed by John J. Henry, who was a western developer of hydropower, and two local flour mill owners, William H. Gilbert and William Shoemaker. Shoemaker's father-in-law, Arnst Loennig, obtained water rights to Rock Creek for the project. Together with Al Welch, owner of the Baker Gas and Electric Company, these men created the Rock Creek Power and Transmission Company. Shortly thereafter, Henry sold his interest in the company and three more local investors took up the cause. This local development was noted in *Electric World and Engineer*, which applauded the local resourcefulness and listed the technology of the plant (EW&E, 1904; Schoeningh, 2003).

Work began on the new masonry diversion dam, powerhouse, penstock, flume, and transmission lines in 1903. The high-pressure penstock was constructed under the direction of J. B. Glatz. All other work proceeded under the direction of F. N. Averill, a constructing electrical engineer. The diversion dam was 30 feet long, 3-4 feet thick and four feet high. It was reported that the first flume was six feet wide, three-feet deep and made of untreated 2 x 12-foot red fir planks. It was covered over its entire length to keep out debris. In addition to local construction crews, hydroelectric engineers were hired to design and supervise the high-pressure penstock. The 2.45-inch nozzle in the

powerhouse was under 960-foot head of pressure. Two 50-inch Pelton water-wheels rated at 750 horsepower each turned a pair of General Electric three-phase generators (EW&E, 1904). Fifteen men were hired just to cut poles for the transmission lines. Another 25 laborers were put to work constructing the 1.25 miles of wood flume. In Baker City, electric workers upgraded the local power grid to handle the three-phase electricity produced by the new plant (EW&E, 1904; Schoeningh, 2003). The electricity flowing into Baker City was used by both commercial and domestic accounts. It also was used to illuminate city streets and power the new streetcar system. Three sub-stations were constructed. In addition, a substation serving the City of Baker, two other substations were built to provide power to the mines of the Cyclone and Cracker Creek mining districts. When the mining districts faded, their share of power produced by the plant was used by local communities (EW&E, 1904; Schoeningh, 2003). To keep the system running required a chief operator, two additional operators and a flume tender, each working 12-hour shifts. They were housed in a large home for the chief operator, three smaller houses for the other two operators and flume tender. A fifth house was added in 1938 for a fifth employee after the Fair Labor Standards Act required eight-hour shifts.

In the wintertime, local farmers were employed to keep the flume clear of ice (Schoeningh, 2003). In 1905, the Baker Light and Power Company was incorporated. It consolidated the Rock Creek Power and Transmission Company and the Baker City Gas and Electric Companies, which had shared board members and stockholders. In 1909, this company would be succeeded by the Elkhorn Light and Power Company. Later, this company would merge with Fremont Power to become Eastern Oregon Light and Power Company, which became part of California-Pacific Utility Company in 1946 (*LaGrande Observer*, 1946). Around 1926, the original flume had to be replaced due to deterioration. The new flume of creosote-treated wood was of smaller dimensions. It fed into a new forebay (reservoir) at the top of the penstock that could provide maximum flow of water through the penstock during peak usage while being recharged by the smaller flume during off-peak hours (Schoeningh, 2003). Four generations of operators lived and worked at the hydroelectric plant. For the last 20 years of its service, the system was operated by Kim Baer. He was only 25 and recently married when he took the job as operator. Automation made it possible for the system to be staffed by only one person (Schoeningh, 2003; Robinson, 2004). The Oregon Trail Electric Consumers Cooperative Company was formed on May 18, 1987. It shortened its name to Oregon Trail Electric Company (OTEC) in November of 1988.

Two years later in 1990, OTEC began preparing for relicensing by 1995. The modern process required expensive environmental studies. As a result, OTEC determined that it would have to forgo relicensing and instead reluctantly decommissioned their power plant. The system was deactivated by OTEC in March 1995 and officially decommissioned in 2003 (FERC Project No. 1986). As part of the decommissioning effort, the hydroelectric system was recorded as a historic site that was

determined to be eligible for the NRHP as the Rock Creek Power Plant Historic District. HABS/HAER drawings and photos were taken of the system and are on file at the Library of Congress (Robinson, 2004; Stamets, 2003; Oregon Secretary of State, 2018). Eastern Oregon Light & Power (EOLP) submitted Pre-Application Document to the Federal Energy Regulatory Commission (FERC) in 2007 to reactivate the system. A final study report was submitted to FERC in May 2011. In 2015, EOLP informed FERC that they had engaged Warm Springs as partners in the project and wished to continue to develop the process using FERC's ILP.

3.3.8.1.2 Area of Potential Effects

Pursuant to section 106, the Commission must take into account whether any historic property could be affected by issuance of an original or new license within a project's APE. The APE is defined as the geographic area or areas that an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE for the proposed project encompasses all lands, project facilities and features within the project boundary. For the proposed project, the APE encompasses 8.4 acres, and consists of areas surrounding the proposed project facilities, including a: (1) 100 x 100-foot square centering on the intake structure/fish screen/fish ladder on Rock Creek; (2) 25-foot wide, 12,400-foot long corridor centered on the proposed powerhouse structure; and (3) 350-foot long, 20-foot wide power line from the powerhouse to the power line interconnect.

3.3.8.1.3 Cultural Resources Investigations

Archaeological Resources

A systematic pedestrian survey for archeological resources was done within the APE on May 15, 2018 and November 9, 2018 by Warm Springs' cultural resources consultant, Dale M. Gray of Frontier Historical Consultants (Gray, 2018). As a result of the systematic investigations, no archaeological resources were located within the APE. No other resources of tribal significance were located, as well.

Historical Resources

Portions of two historic built environment resources were located and recorded within the APE, consisting of the previously documented Rock Creek Power Plant Historic District and the Wilcox Ditch. Both resources are considered eligible for the National Register, however, only a fraction of each resource is within the APE. Portions of two contributing elements of the Rock Creek Power Plant Historic District that are within the APE include the penstock and reservoir used as a forebay for the original powerhouse. Both features were constructed in 1904 and modified later in 1926, and both features are considered contributing elements of the Historic District. The Wilcox

Ditch was built shortly after 1899 and conveys water 6.5 miles from Rock Creek and Willow Creek to Pole Line Road where it splits into several feeder ditches. The component of the Wilcox Ditch that extends into the APE consists of the headworks where a recently installed metal head gate and small wood bridge exists. Neither installed metal head gate or wood bridge are considered contributing elements to the Wilcox Ditch.

Some segments of the Rock Creek Power Plant wood stave flume (constructed in 1904 and later removed and reconstructed in 1926) still exists within the APE, but adverse effects to it were mitigated through HABS/HAER documentation as specified through a memorandum of agreement executed between the Commission and Oregon SHPO when the Rock Creek Hydroelectric Project (FERC Project No. 1986) was decommissioned in 2003. Most of the wood stave flume has been dismantled after decommissioning, although segments of the flume remain on Forest Service lands within the APE where it is planned to be removed to facilitate greater movements of large mammals near and within the proposed project. However, removal of the remaining sections of flume on Forest Service lands would not constitute an adverse effect as the flume has been adequately documented and mitigated and is no longer considered a contributing element to the Historic District (see Gray 2018, pages 23-27).

3.3.8.2 Environmental Effects

Warm Springs proposes to avoid the historic penstock and reservoir of the Historic District by diverting construction activities away from either feature during project construction or subsequent operation and maintenance of the project. The proposed project during construction or subsequent operation and maintenance would also not affect any significant aspect of the Wilcox Ditch.

Our Analysis

The proposed project would have no adverse effects to historic properties because Warm Springs would avoid the historic penstock and reservoir associated with the Historic District and avoid historic aspects of the Wilcox Ditch during project construction and subsequent operation of the proposed project. As a result, we find that the proposed project would have no adverse effects to historic properties, and the Oregon SHPO concurs with this finding (see their letter, filed on April 22, 2020). Nevertheless, there is always a possibility that unknown archaeological resources may be discovered in the future as a result of the project's construction, operation, or project-related activities. Consulting with the Oregon SHPO (and including the Forest Service when their lands are involved) in the event a significant cultural resource is inadvertently discovered during project construction, operation, or maintenance activities would ensure that any adverse effects to it can be avoided, reduced, or mitigated.

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative (denial of the application), the Rock Creek Project would not be constructed and would not generate an estimated average annual generation of 3,900 MWh. Under this alternative, environmental resources in the project area would not be affected, including any enhancement measures that were proposed as part of the license application and required by the Forest Service, FWS, and Oregon DFW.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the proposed project's use of the Rock Creek for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corporation*,²⁸ the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead Corporation*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the cost of individual measures considered in the EA for the protection, mitigation and enhancement of environmental resources affected by the project; (2) the cost of alternative power; (3) the total project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

8 summarizes the assumptions and economic information we use in our analysis. This information, except as noted, was provided by Warm Springs in its license

²⁸ See *Mead Corp., Publ'g Paper Div.*, 72 FERC ¶ 61,027 (1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

application (Warm Springs, 2019). We find that the values provided by Warm Springs are reasonable for the purposes of our analysis. Costs are provided in 2019 dollars unless otherwise noted.

Table 8. Parameters for the economic analysis of the proposed Rock Creek Project (Source: Warm Springs, 2019, as modified by Staff).

Parameter	Value
Period of analysis (years)	30
Financing period (years)	20
Initial construction cost, \$	\$2,000,000
Operation and maintenance, \$/year	\$98,000
Alternative energy value (\$/MWh) ^a	\$21.49
Capacity value (kW-year) ^a	\$159.7
Interest rate (%)	8.0
Discount rate (%) ^b	8.0

^a Source: Energy Information Administration using rates obtained from Annual Energy Outlook 2020 at <http://www.eia.gov/outlooks/aeo/index.cfm>.

^b Discount rate estimated by staff to be the same as the interest rate.

4.2 COMPARISON OF ALTERNATIVES

Error! Reference source not found.9 summarizes the installed capacity, annual generation, cost of alternative power, estimated total project cost, and the difference between the cost of alternative power and total project cost for each of the action alternatives considered in this EA (Warm Springs’ proposal and the staff alternative).

Table 9. Summary of annual cost of alternative power and annual project cost for the action alternatives for the proposed Rock Creek Project (Source: Staff).

	Warm Springs’ Proposal	Staff Alternative	Staff Alternative with Mandatory Conditions
Installed capacity (MW)	0.85	0.85	0.85
Annual generation (MWh)	3,900	3,900	3,194 ^a
Dependable capacity (MW)	0.85	0.85	0.85
Annual cost of alternative power (\$/MWh)	\$220,000 56.3	\$220,000 56.3	\$204,000 63.99
Annual project cost (\$/MWh)	\$287,000 73.46	\$297,000 76.07	\$296,000 92.52
Difference between the cost of alternative power and project cost (\$/MWh)	(\$67,000) (17.17)	(\$77,000) (19.78)	(\$91,000) (28.53)

^a Annual generation would be lower for this alternative because of the increased minimum flows in the bypass reach recommended by Oregon DFW (30(c) condition 3) and FWS (30(c) condition 4) and smaller amounts of flows available for generation.

4.2.1 No-action Alternative

Under the no-action alternative, the project would not be constructed.

4.2.2 Applicant’s Proposal

Under Warm Springs’ proposal, the project would have an installed capacity of 0.85 MW and generate an average of 3,900 MWh of electricity annually. The average annual cost of alternative power would be \$220,000, or \$56.3/MWh. The average annual project cost would be \$287,000, or about \$73.46/MWh. Overall, the project would produce power at a cost which is \$67,000, or \$17.17/MWh, more than the cost of alternative power during the first full year of project operations.

4.2.3 Staff Alternative

The staff alternative includes the same developmental features as Warm Springs' proposal and therefore would have the same capacity and energy attributes. **Error! Reference source not found.**¹⁰ shows the added staff-recommended environmental protection and enhancement measures and the estimated cost of each.

Based on an installed capacity of 0.85 MW and an average annual generation of 3,900 MWh, the cost of alternative power would be \$220,000, or \$56.3/MWh. The annual project cost would be \$297,000 or about \$76.07/MWh. Overall, the project would produce power at a cost that is \$77,000 or \$19.78/MWh, more than the cost of alternative power.

4.2.4 Staff Alternative with Mandatory Conditions

The staff alternative with mandatory conditions includes the same developmental features as Warm Springs' proposal and therefore would have the same capacity and energy attributes.

Based on an installed capacity of 0.85 MW and an average annual generation of 3,194 MWh, the cost of alternative power would be \$204,000, or \$63.99/MWh. The annual project cost would be \$296,000 or about \$92.52/MWh. Overall, the project would produce power at a cost that is \$91,000 or \$28.53/MWh, more than the cost of alternative power.

4.3 COST OF ENVIRONMENTAL MEASURES

Error! Reference source not found.¹⁰ gives the cost of each of the environmental enhancement measures considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 10. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of constructing and operating the proposed Rock Creek Project (Source: Staff).

No.	Enhancement/Mitigation Measures	Entity	Capital Cost (2019\$)	Annual Cost (2019\$) ^a	Levelized Annual Cost (2019\$) ^b
Geological and Soil Resources					
1	Revise Erosion Control Plan to include: agency provisions for BMPs to address: pre-washing all imported materials; contain and dispose of wash water; construction materials and debris – disposal and surface water protection; concrete and materials control measures; washing of equipment and spill containment; containment of hazardous materials away from waterways	Warm Springs, FWS (condition 9), Oregon DFW (condition 7); Forest Service (condition 7); Staff	\$10,000	\$0	\$1,000
Aquatic Resources					
2	Minimum flow release (vary on biweekly intervals from 6-12 cfs August 1 through April 30 and 15-20 cfs May 1 through July 31)	Warm Springs; Forest Service (condition 10); Staff	\$0	\$0	\$0
3	Minimum flow release (vary on a biweekly basis from 9-12 cfs July 1 through February 15 and 15-20 cfs February 16 through June 30)	Oregon DFW (condition 3); FWS (condition 4)	\$0	\$15,200	\$15,200

No.	Enhancement/Mitigation Measures	Entity	Capital Cost (2019\$)	Annual Cost (2019\$) ^a	Levelized Annual Cost (2019\$) ^b
4	New flow gauges for Minimum Flow Monitoring	Warm Springs, Forest Service (condition 10); Oregon DFW (condition 3); FWS (condition 4); Staff	\$10,000	\$3,000	\$4,500
5	Ramping rates ^c	Warm Springs, Forest Service (condition 10); Oregon DFW (condition 5); FWS (condition 5); Staff	\$0	\$0	\$0
6	Water Quality Management Plan (including water quality monitoring)	Warm Springs, Forest Service (condition 9); Oregon DFW (condition 6); FWS (condition 7); Staff	\$1,500	\$1,000	\$1,300

No.	Enhancement/Mitigation Measures	Entity	Capital Cost (2019\$)	Annual Cost (2019\$) ^a	Levelized Annual Cost (2019\$) ^b
7	Design, install, and operate fish passage facilities and fish screen	Warm Springs, Forest Service (condition 11); Oregon DFW (condition 2); FWS (condition 13); Staff	\$130,000	\$5,000	\$19,000
8	Develop a fish passage post construction evaluation and monitoring plan	Oregon DFW (condition 2); FWS (condition 14); Staff	\$5,000	\$0	\$500
9	Fishery habitat mitigation and plan revision	Warm Springs; Forest Service (condition 12); Oregon DFW (condition 3); FWS (condition 4)	\$25,000	\$0	\$2,550
10	Document bull trout observed or collected in the project area ^d	FWS (Condition 17); Oregon DFW (condition 14); Staff	\$0	\$0	\$0

No.	Enhancement/Mitigation Measures	Entity	Capital Cost (2019\$)	Annual Cost (2019\$) ^a	Levelized Annual Cost (2019\$) ^b
11	Develop an annual operations and maintenance plan	FWS (Condition 6); Oregon DFW (condition 4); Staff	\$5,000	\$0	\$500
Terrestrial Resources					
12	Revise the proposed Revegetation Plan to include measures from agencies' conditions for BMPs, revegetation, and monitoring	Warm Springs; FWS (condition 10); Oregon DFW (condition 8); Staff	\$5,000	\$10,000	\$12,000
13	Design transmission line poles to maintain conductor spacing and geometry for raptor protection consistent with 1996 APLIC guidelines	Warm Springs	\$0 ^e	\$0	\$0
14	Develop a terrestrial wildlife resource management plan (TRMP)	FWS (conditions 8 and 11); Oregon DFW (conditions 9 and 10); Staff	\$10,000	\$10,000	\$12,500
15	Include Spring Connectivity and Wetland Impact measures in the TRMP	FWS (conditions 8 and 11); Oregon DFW (conditions 9 and 10)	\$10,000	\$0 ^f	\$1,000

No.	Enhancement/Mitigation Measures	Entity	Capital Cost (2019\$)	Annual Cost (2019\$) ^a	Levelized Annual Cost (2019\$) ^b
16	Temporary stream crossings	FWS (condition 18); Oregon DFW (condition 15); Staff	\$5,000	\$0	\$500
Land Use and Aesthetics Resources					
17	Retain a line of trees to screen view of powerhouse from Rock Creek Road	Warm Springs	\$0 ^c	\$0	\$0
18	Fire and Fuels Management Plan	Forest Service (condition 13); Staff	\$4,000	\$0	\$400
Cultural Resources					
19	In the event that archeological resources are discovered, cease construction and notify Oregon SHPO and Forest Service (if on their lands) and develop an HPMP if the resource is determined to be eligible for the National Register ^d	Staff	NA	NA	NA

^a Annual costs typically include operation and maintenance costs and any other costs which occur on a yearly basis.

^b All capital and annual costs are converted to equal annual costs over a 30-year period to give a uniform basis for comparing costs.

^c Ramping cost is negligible because the number of hours per year that ramping would be required would be negligible.

^d Zero cost assigned to this measure because it is contingent on the discovery of bull trout.

^e Included in construction costs

- f Annual cost would be contingent on number of mitigation sites selected based on agency consultation.
- g Cost included in proposed Revegetation Plan.
- h Zero cost assigned to this measure because it is contingent on the discovery of archeological resources.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for licensing the Rock Creek Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on Commission staff's independent review of the environmental and economic effects of the proposed project and its alternatives, we selected Warm Springs' proposal with certain Forest Service 4(e) conditions, FWS and Oregon DFW's 30(c) conditions, and certain staff-recommended modifications as the preferred alternative (the staff alternative). We recommend this alternative because: (1) issuance of an original hydropower license by the Commission would allow Warm Springs to build and operate the project as an economically beneficial and dependable source of electrical energy; (2) the 0.85-MW of electric capacity comes from a renewable resource which does not contribute to atmospheric pollution; (3) the public benefits of this alternative would exceed those of the no-action alternative; and (4) the proposed and recommended measures would protect and enhance environmental resources affected by constructing, operating, and maintaining the project.

In the following section, we make recommendations as to which environmental measures proposed by Warm Springs or recommended by agencies should be included in an original license issued for the project. We also recommend two additional environmental measures to be included in any original license issued for the project. In Appendix A, we provide draft license articles.

5.1.1 Measures Proposed by Applicant

Based on our environmental analysis of Warm Springs' proposal in section 3 and the costs discussed in section 4, we find that including the following environmental measures proposed by Warm Springs would protect environmental resources and be worth the cost. Therefore, we recommend including these measures in any license issued for the project.

Geology and Soils

- Implement an Erosion Control Plan, including standard erosion control measures to minimize erosion and avoid adverse effects on turbidity and sedimentation in Rock Creek during project construction.

Aquatic Resources

Water Quantity

- Implement a Minimum Flow Plan including plans for run-of-river operation, the proposed minimum flows (vary on biweekly intervals from 6-12 cfs August 1 through April 30 and 15-20 cfs May 1 through July 31), and the installation of a flow gauge below the project diversion to monitor compliance with the project minimum flow requirements. Irrigation demand and minimum instream flow requirements in the bypassed reach must be met before any water is diverted for power generation.

Water Quality

- Implement a Water Quality Management Plan, including measures to curtail diversion if needed to prevent warming of water in the bypassed reach of Rock Creek by more than 0.5°F as well as provisions for pollution and spill prevention and contaminant procedures for project construction, operation, and maintenance.

Fisheries Resources

- Design, install, and operate upstream and downstream fish passage facilities, including a fish screen at the diversion structure to allow movement of all resident fish past the diversion structure and to prevent fish entrainment into the project pipeline. The design would be developed in consultation with the Forest Service, FWS, and Oregon DFW.

Terrestrial Resources

- Implement a Revegetation Plan which would include measures to revegetate all areas disturbed by project-related construction in order to minimize effects to wildlife habitat.

- Design the poles for the 350-foot-long transmission line to maintain conductor spacing and geometry for raptor protection consistent with 1996 APLIC standards.
- Remove all sections of wooden flume from the previously-licensed project on Forest Service land along the pipeline corridor, for the purpose of enhancing habitat for large animals such as deer and elk, by eliminating a movement barrier.
- Install the pipeline to include overhead sections at Rock Creek and at two small ravines to prevent any disturbance to the Rock Creek stream channel and to any seasonally flowing springs in the ravines, and to facilitate wildlife movement at the project.

Land Use and Aesthetics

- Retain a line of trees to screen the powerhouse from the view of Rock Creek Road.

5.1.2 Additional Staff-Recommended Measures

In addition to Warm Springs' proposed measures listed above, we recommend the following additional measures in any license issued for the Rock Creek Project:

- Revise the proposed Erosion Control Plan to include the additional provisions specified in Forest Service 4(e) condition 7, Oregon DFW 30(c) condition 7, and FWS 30(c) condition 7, including specific rehabilitation techniques and monitoring elements necessary to mitigate all ground disturbing activities during project construction, operation, and maintenance, such as: (1) monitoring of sediment and erosion control measures for three years for compliance with prescribed performance measures; and (2) consulting with Forest Service if re-vegetation measures are not met within three years..
- Implement agency-recommended ramping rates (Forest Service 4(e) condition 10, Oregon DFW 30 (c) condition 5, FWS 30(c) condition 5) not to exceed 1 inch per hour from May 1 to October 31 and 2 inches per hour from November 1 to April 30 during any start up or shut down activities including construction of the diversion weir, filling of the pool, and any subsequent draining or filling of the pool.
- Implement the mandatory agency minimum instream flows described in FWS and Oregon DFW 30(c) conditions 4 and 3 respectively (table 7 of this document), as recommended by Oregon DFW (IS 72194) necessary to maintain current salmonid populations.

- Revise the proposed Minimum Flow Plan to include the installation and operation of an additional streamflow gauging station below the Olsen Ditch irrigation diversion within the bypassed reach to monitor compliance with the project minimum flow requirements.
- Develop a post-construction hydraulic evaluation and monitoring plan, and implementation schedule for all fish passage facilities as required by FWS 30(c) condition 14 and Oregon DFW 30(c) condition 2 that includes: (1) short-term hydraulic evaluation ensuring performance is consistent with design criteria, (2) a long-term monitoring plan and implementation schedule that performance is maintained and design criteria are met throughout the license term, and (3) consultation with the Forest Service, FWS, and Oregon DFW if criteria are not being met.
- Develop an operation and maintenance plan as required by FWS and Oregon DFW 30(c) conditions 6 and 4, respectively (including operator training and supervision), that list procedures needed to maintain minimum instream flows, adhere to ramping rates, and operate and maintain the fish passage facilities. The plan should include procedures for maintenance scheduling, and an emergency contingency plan.
- Document any bull trout observed or collected at the project, as required by FWS's 30(c) condition 17, and provide an annual report to the Forest Service, FWS, Oregon DFW, Oregon DEQ, Oregon WRD, and the Confederated Tribe of the Umatilla Indian Reservation that includes information on: (1) the number, estimated length, and geographic location of the bull trout; (2) the date that the bull trout were observed or collected; (3) whether bull trout were alive or dead; and (4) the name of the person that observed or collected the bull trout.
- Revise the proposed Revegetation Plan to include agency mandatory conditions filed by Forest Service 4(e) condition 8, FWS 30(c) condition 10, and Oregon DFW 30(c) condition 8, including: (1) mapping the conifer and deciduous trees to be removed in the penstock right-of-way; (2) seeding the penstock right-of-way, including the cut banks and out slopes, with Forest Service-approved native plant seeds; (3) implementing best management practices at the project to prevent the establishment and spread of invasive non-native plants; (4) implementing cleaning and inspection programs for all construction equipment at the project; (5) limiting project-related construction activity to previously disturbed areas, to the extent possible; (6) ensuring materials used on project land that is also Forest Service land are inspected by a District or Forest weed specialist and judged to be weed-

free; (7) implementing noxious weed control measures to ensure all disturbed areas on project lands are treated; (8) monitoring for noxious weed control and re-vegetation efforts on project lands; and (9) replanting all disturbed soils on project lands with approved seed mixes or native plants. Modify FWS's revegetation and noxious weed management plan (condition 10) to align post-construction monitoring requirements with those required by Forest Service and Oregon DFW; require all monitoring to occur during the peak growing season in the spring; and file monitoring reports with the Commission.

- Develop a terrestrial wildlife resource management plan (TWRMP) according to FWS 30(c) condition 8 and Oregon DFW 30(c) condition 9 to minimize the impacts to wildlife that result from project construction, operation, and maintenance, including: developing a strategy and schedule to mitigate for any permanent loss of terrestrial habitat on project lands, with additional provisions to protect springs and wetlands on project lands.
- Consult with FWS, Forest Service, Oregon DFW, and Oregon DEQ for prior approval of locations and designs for construction of temporary stream crossings to be used during project construction activities, including, but not limited to, pipeline construction, as required by FWS 30(c) condition 18 and Oregon DFW 30(c) condition 15.
- Develop a hazardous substance management plan for the project that includes provisions to prevent oil and other hazardous substance from negatively affecting terrestrial and aquatic resources.
- Develop a fire and fuels management plan for the project that includes measures for fuel treatment/vegetation management, fire prevention and patrol, emergency response preparedness, reporting, and fire control/extinguishing.
- In the event that archeological resources are discovered, cease construction and notify Oregon SHPO and Forest Service (if on their lands) and develop an HPMP if the resource is determined to be eligible for the National Register. If a historic property would be potentially adversely affected by project operation, notify Oregon SHPO and develop an HPMP to resolve such adverse effects.

Below we discuss the rationale for our additional staff-recommended measures and modifications to the proposed measures.

Erosion Control Plan

Warm Springs' proposed Erosion Control Plan includes the following control measures: (1) conduct all in-water work during the Oregon in-water work window from July 1 to October 31 when flows in Rock Creek are normally between 10 - 20 cfs and the active channel is narrow; (2) conduct turbidity monitoring during all construction activities having the potential to increase sedimentation in Rock Creek; and (3) adhere to Oregon DEQ and Forest Service BMPs in the design, installation and maintenance of erosion controls. Forest Service, FWS, and Oregon DFW filed virtually identical conditions (Forest Service 4(e) condition 7, FWS 30(c) condition 9, Oregon DFW 30(c) condition 7) all of which stipulate that Warm Springs revise its proposed Erosion Control Plan to include additional measures for construction-related activities, revegetation, consultation, and monitoring. In our analysis in section 3.3.1.2, *Geology and Soils, Environmental Effects*, we determined that detailed erosion control measures should be based on site-specific conditions and final design of project features. Therefore, we recommend that Warm Springs revise the Erosion Control Plan to include specific rehabilitation techniques and monitoring elements with the objective of mitigating all ground disturbing activities during project construction, operation, and maintenance, such as: (1) monitoring of sediment and erosion control measures for three years for compliance with prescribed performance measures; and (2) consulting with Forest Service if re-vegetation measures are not met within three years. We estimate that the levelized annual cost of these additional measures would be \$1,000 and that the benefits are worth the cost.

Ramping Rates

Although the project is proposed to be operated in run-of-river mode and large or sudden fluctuations in downstream flow are unlikely, as discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, there is the potential for start-up or shut down activities to adversely affect downstream aquatic resources. Implementation of agency recommended ramping rates during initial fill and subsequent draining and fill of the reservoir pool would reduce the adverse effects of ramping (e.g., entrapment of fish in isolated pools and flushing of fish downstream) at a minimal cost, and therefore, we recommend them.

Streamflow Gauging Stations

As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, two streamflow gauging stations located within the bypassed reach, one at the diversion weir

and one below the Olsen irrigation diversion, are required to ensure compliance with the recommended ramping rate and minimum flow requirements. While locating a single gauging station at the diversion weir, as proposed by Warm Springs and recommended by the agencies, would adequately monitor the recommended ramping rates it would be insufficient to ensure compliance with the minimum flow requirements in the bypassed reach. The reason why it is insufficient is because such a gage would not take into account withdrawals that occur in the bypassed reach at the Olsen Ditch irrigation diversion. Although the irrigation season coincides with the high-water period in Rock Creek when flows would normally exceed the project's hydraulic capacity (13 cfs) plus minimum flow requirements (10-20 cfs), there is the potential that withdrawals at the Olsen Ditch during dry water years would reduce streamflow below the minimum flow threshold in the lower 0.25-mile section of the bypassed reach if minimum flows are just monitored at the project diversion. Therefore, we recommend that an additional gauging station be located in the bypassed reach below the Olsen Ditch irrigation diversion to monitor compliance with the recommended minimum flow requirement. Because the recommended minimum flow requirement is necessary to protect salmonid migration, spawning, egg incubation, fry emergence, and juvenile rearing, the gage would need to provide continuous streamflow data. We estimate that this recommendation would have a levelized annual cost of \$4,500 and that the benefit to minimum flow compliance and outweigh the cost.

Post Construction Hydraulic Evaluation Plan

As discussed in section 3.3.3.2, *Fisheries Resources, Environmental Effects*, fish passage facilities are required to provide upstream and downstream movement for migratory fish. Adjustments are often required with new or modified facilities to ensure that the facilities function as designed. Warm Springs must develop and implement hydraulic evaluation plans to determine fishway system effectiveness and whether any modifications are needed to reduce any fish delay, loss, injury, or hydraulic problems that may be present. Post hydraulic evaluation would identify if and where such adjustments are necessary. The results of hydraulic evaluation would provide the basis for determination of whether the fishways are functioning as designed. We estimate that this would have a levelized annual cost of \$500 and is justified by the benefits.

Operation and Maintenance Plan

As discussed in section 3.3.3.2, *Fisheries Resources, Environmental Effects*, proper maintenance would be vital to ensuring the fish passage facilities continue to operate as intended. Because the facilities would be in operation continuously, wear and tear, corrosion, accumulation of sediment, debris, and other environmental stressors could decrease the effectiveness of fish passage features. If left untreated, these factors would decrease fishway effectiveness. An operation and maintenance plan, designed in

consultation with the Forest Service, FWS, and Oregon DFW would ensure the fish passage facilities operate effectively throughout the term of any license. We estimate that the levelized annual cost of this measure would be \$500, and the benefits justify the cost.

Document and Report Bull Trout

Bull trout are not currently present within the project boundaries of the Rock Creek system as discussed in section 3.3.3.2, *Fisheries Resources, Environmental Effects*. Because bull trout are a federally listed threatened species, reporting any bull trout observations to the Forest Service, FWS, Oregon DFW, Oregon DEQ, Oregon WRD, and the Confederated Tribe of the Umatilla Indian Reservation in the event bull trout are discovered at the project area would help to protect the species from any project-related effects at minimal or no cost. Therefore, we recommend this measure.

Revegetation Plan

Construction of the proposed project would result in both temporary and permanent loss of vegetation and has the potential to allow invasive plant species to be introduced and established within the project area. Warm Springs proposes to implement a Revegetation Plan, which includes measures to revegetate disturbed areas and control the introduction and spread of invasive plants. Forest Service, FWS, and Oregon DFW filed mandatory conditions to revise the proposed Revegetation Plan with modifications to the monitoring periods, and additional BMP and revegetation measures.

In section 3.3.4.2, *Terrestrial Resources, Environmental Effects, Vegetation*, we noted that there is a discrepancy in the monitoring schedules provided by FWS and Oregon DFW in their 30(c) conditions for a revegetation and noxious weed management plan. FWS's condition requires twice annual monitoring (in the spring and fall) every third year thereafter (i.e., years 6, 9, and 12) following the initial three-year post-construction monitoring. Oregon DFW's condition requires monitoring every other year (i.e., years 5, 7, and 9) following the initial 3 years of post-construction monitoring. Oregon DFW's monitoring schedule is consistent with the one required by Forest Service's 4(e) condition 8, vegetation management on National Forest Service Lands. The monitoring schedules required by Forest Service and Oregon DFW would be more efficient than that required by FWS. Surveying once every other year (after the initial annual monitoring surveys for the first three years after construction) would be more likely to detect introduction and spread of noxious weeds and better enable Warm Springs to control them than surveying twice a year every three years. Filing monitoring reports with the Commission would allow more efficient enforcement of this condition for any license issued for the project. Therefore, modifying the monitoring schedule for the revised Revegetation Plan to follow those provided by Forest Service and Oregon DFW and applying to all project lands would be a more efficient strategy for ensuring

that revegetation measures are effective. We estimate that the levelized annual cost of these measures would be \$12,500 and determine that the benefits are worth the cost, and recommend revision of the plan as described above.

Terrestrial Wildlife Resource Management Plan

Though construction of the proposed project would be confined to a relatively small area, tree removal for the proposed pipeline corridor and construction of the proposed transmission line could negatively affect breeding birds and affect wetland habitats. As discussed in section 3.3.4.2, *Terrestrial Resources, Environmental Effects, Wildlife*, developing a TWRMP in consultation with Forest Service, FWS, and Oregon DFW would include measures to protect wildlife habitat and avian species, such as timing of construction activities to protect nesting birds, and constructing the transmission line in accordance with current APLIC standards.

We estimate that the levelized annual cost of developing the plan, excluding a provision for wetland mitigation for the pipeline (discussed in section 5.1.3 below), would be \$12,500 and determine that the benefits are worth the cost, and recommend development of the plan as described above.

Temporary Stream Crossings

Construction of the proposed pipeline could affect aquatic and riparian habitats, and the species that inhabit them. Water quality may also be affected by pipeline construction. In section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, we analyzed the 30(c) conditions filed by FWS and Oregon DFW (conditions 18 and 15, respectively), requiring Warm Springs to consult with Forest Service, FWS, Oregon DFW, and Oregon DEQ for location, design, and approval of any temporary stream crossings during construction to protect water quality and aquatic and riparian habitats. We estimate that the levelized annualized cost of developing the plan would be \$500 and that the benefits are worth the cost.

Fire and Fuels Management Plan

Project construction, operation, and maintenance increase potential for wildland fire occurrence. Warm Springs does not propose any measures related to fire prevention. Forest Service 4(e) condition 13 specifies Warm Springs to develop a fire prevention and response plan in consultation with the Forest Service. The plan would include the following provisions: (1) identify hazard reduction and recurring maintenance measures in order to prevent the spread of fire outside of the project boundary, (2) address fire hazard and public safety associated with public recreation use and access of the project

facilities, (3) report any project-related fire immediately to the Forest Service, (4) analyze fire prevention and suppression equipment and personnel, and advise Forest Service of the locations and availability of those resources.

As discussed in section 3.3.7.2, *Land Use and Aesthetic Resources, Environmental Effects*, developing a fire and fuels management plan, as specified by the Forest Service, would help prevent potential fires from spreading beyond project lands, and would aid county and agency personnel if a fire were to move beyond the project boundary. We estimate that the plan would have a level annualized cost of \$400. We determine that the benefits of the plan would be worth the cost, and therefore, recommend the plan as described above.

Consultation on Previously Undiscovered Archeological Resources

Portions of two historic built environment resources were located and recorded within the APE, consisting of the previously documented Rock Creek Power Plant Historic District and the Wilcox Ditch. Both resources are considered eligible for the National Register. These include the penstock and reservoir used as a forebay for the original powerhouse. Both features were constructed in 1904 and modified later in 1926, and are considered contributing elements of the Historic District. As we discussed in section 3.3.8.2, *Cultural Resources, Environmental Effects*, Warm Springs proposes to avoid the historic penstock and reservoir of the Historic District by diverting construction activities away from either feature during project construction or subsequent operation and maintenance of the project. The proposed project during construction or subsequent operation and maintenance would also not affect any significant aspect of the Wilcox Ditch. As a result, we find that the proposed project would not have an adverse effect to historic properties, and the Oregon SHPO concurs with this finding. However, there is always a possibility that unknown archaeological resources may be discovered in the future as a result of the project's construction, operation, or project-related activities. Consulting with the Oregon SHPO (and the Forest Service when their lands are involved) in the event a significant cultural resource is inadvertently discovered during project construction, operation, or maintenance activities would ensure that any adverse effects to it can be avoided, reduced, or mitigated. Therefore, we recommend this measure and estimate its cost to be negligible.

5.1.3 Measures Not Recommended by Staff

Minimum Instream Flows

Diverting water for power generation would reduce streamflow through the bypassed reach, which would result in a reduction in the amount of available fish habitat. Warm Springs proposes to provide minimum instream flows and habitat mitigation in

Rock Creek to minimize this effect on fish habitat throughout the bypassed reach. These minimum flows are as follows: 6 cfs January 1 through March 15; 8 cfs March 16 through March 30; 10 cfs April 1 through April 15; 12 cfs April 16 through April 30; 20 cfs May 1 through June 15; 15 cfs June 16 through July 30, 12 cfs August 1 through August 30; and then reducing back to 6 cfs September 1 through December 30.

The Forest Service, FWS, and Oregon DFW filed mandatory 30(c) conditions (4 and 3, respectively) requiring Warm Springs to provide one of two minimum flow regimes based on whether habitat mitigation is completed within Rock Creek. Forest Service 4(e) condition 10 requires minimum flows as proposed by Warm Springs. The FWS and Oregon DFW conditions give the option to Warm Springs to either: (1) provide instream flows as recommended by Oregon DFW in IS 72194 that are necessary to maintain salmonid population levels (higher than proposed minimum instream flows), or (2) provide instream flows as proposed, and habitat mitigation in consultation with stakeholders. The flows recommended in IS 72194 are as follows: 9 cfs January 1 through February 15, 15 cfs February 16 through February 30, 20 cfs March 1 through June 15, 15 cfs June 16 through June 30, 12 cfs July 1 through July 30, and 9 cfs August 1 through December 30.

The target species for the IFIM study that Warm Springs conducted to evaluate the potential effects of minimum flows in the bypassed reach were bull trout and redband trout. However, because bull trout have not been documented to occur within Rock Creek, we only consider the potential effects on redband trout habitat in evaluating the appropriate minimum flows for the bypassed reach.

The spawning period for redband trout occurs from the beginning of March to mid-June. While Warm Springs determined based on its IFIM study that no suitable spawning habitat for redband trout is present in the bypassed reach due to a lack of suitable substrate (gravel), the study data show that gravel made up 15, 24, 10, and 12 percent of the substrate type in reaches 1 through 4, respectively, of the bypassed reach and redband trout young-of-year were observed. Based on the presence of gravel substrate, young-of-year redband trout, and the fact that redband trout only need small patches of gravel to successfully spawn, staff conclude that redband trout spawning is currently likely to occur in the project bypassed reach. Although the IFIM study did not evaluate the percentage of redband trout spawning habitat available at different flows, due to Warm Springs' assessment that no suitable habitat was present, it did evaluate the percentage of redband trout juvenile rearing habitat. While Oregon DFW and FWS recommend a minimum flow of 20 cfs in the bypassed reach for the entire spawning period of March through mid-June, Warm Springs proposes to ramp up minimum flows from 6 to 12 cfs between March through April in 2 cfs increments every two weeks and then maintain a minimum flow of 20 cfs from May through mid-June. Warm Springs' lower minimum flows during March through April of the redband trout spawning period

would provide between 69.7 and 80.7 percent of the maximum juvenile rearing habitat in comparison to approximately 90 percent with the 20 cfs recommended by Oregon DFW and FWS.

The annual forgone project generation and cost of Warm Springs' proposed minimum flows would be 2,615 MWh and \$56,200, respectively. The annual foregone generation and cost of the minimum flows recommended by FWS and Oregon DFW would be 3,321 MWh and \$71,400, respectively. Although providing the minimum flows recommended by FWS and Oregon DFW would provide increased habitat availability for redband trout when compared to the proposed minimum flows, it would also result in about 700 MWh less generation (3,900 to 3,194 MWh) than that of Warm Springs' proposed flows, based on expected water availability from the historic flow record in Rock Creek. The incremental increase in the cost would be \$15,200. In consideration of the aforementioned benefits and costs of the proposed and recommended minimum flows, we conclude that the incremental habitat protection provided by the agencies' recommended minimum flows would not be worth the estimated annual cost of \$71,400. Therefore, we do not recommend the agencies' minimum flows.

Fish Habitat Mitigation

Forest Service 4(e) condition 12 requires Warm Springs to finalize a Fishery Habitat Mitigation Plan in consultation with stakeholders and implement the plan upon completion as mitigation for habitat loss resulting from reduced flows in the bypassed reach. FWS (30(c) condition 4), and Oregon DFW (30(c) condition 3) also require Warm Springs to complete and implement a habitat mitigation plan as mitigation for habitat loss, but only if Warm Springs decides not to provide minimum flows as recommended in Oregon DFW's IS 72194 that were determined to be minimum flows required to maintain fish populations. As discussed in 3.3.3.2, *Fisheries Resources, Environmental Effects*, the Fishery Habitat Mitigation Plan is incomplete. Because habitat enhancement/mitigation projects have not been chosen, and project sites have not been evaluated, we are not able to assess how effective any mitigation projects would be in minimizing, or mitigating for, the loss of fish habitat within the bypassed reach. For these reasons, we are not recommending habitat mitigation, and we cannot justify the associated \$2,550 annualized cost.

Spring Connectivity and Wetland Impacts

FWS 30(c) condition 11 and Oregon DFW 30(c) condition 10 would require Warm Springs to conduct an additional wetland delineation study and consult with Forest Service, FWS, and Oregon DFW to identify mitigation sites so that construction of the proposed project would result in no net permanent loss of wetland habitat, in the event that Warm Springs deviates from their current proposal for construction of the pipeline.

Including measures to protect springs and wetland habitats, and identifying the locations for one or more mitigation sites for any permanent loss of wetland habitats due to project construction would ensure these fragile, important habitats are protected in the event that the project is not constructed as proposed, or the proposal changes. In section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, our analysis indicates that the pipeline design under current project proposal would not affect wetlands. Therefore, wetland mitigation, as required by FWS and Oregon DFW's 30(c) conditions 11 and 10, respectively, would not be necessary and would not be worth the levelized annual cost of \$1,000.

5.2 UNAVOIDABLE ADVERSE EFFECTS

The permanent removal of up to 65 trees with a greater than six-inch dbh, disturbance to wildlife species caused by noise and movement from increased human, equipment, and vehicular activity would occur as a result of construction activities, as discussed in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*.

5.3 SUMMARY OF SECTION 4(e) AND 30(c) CONDITIONS

5.3.1 Land Management Agencies' Section 4(e) Conditions

We discuss the preliminary 4(e) conditions submitted by the Forest Service in the following subsection. We note that section 4(e) of the FPA provides that any license issued by the Commission "for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation." Thus, any 4(e) condition that meets the requirements of the law must be included in any license issued by the Commission, regardless of whether we include the condition in our Staff Alternative.

5.3.1.1 Forest Service's Section 4(e) Conditions

Of the Forest Service's 13 preliminary conditions, we consider 7 of the conditions (conditions 1 – 6, parts of 7, and 9) to be administrative or legal in nature and not specific environmental measures. We therefore, do not analyze these conditions in this EA. Table 11 summarizes our conclusions with respect to the 6 remaining preliminary 4(e) conditions that we consider to be environmental measures. We include in the Staff Alternative 5 conditions as specified by Forest Service.

Table 11. Forest Service (FS) preliminary section 4(e) for the proposed Rock Creek Project (Source: Staff).

Agency and Condition No.	Annualized Cost	Adopted in staff alternative?
FS 7 – Erosion and Sediment Control Plan	\$1,000 ^a	Yes
FS 8 – Vegetation Management on National Forest Service Lands	\$12,000 ^a	Yes
FS 10 – Rock Creek Project Operation, Instream Flows and Gaging	\$4,500	Yes
FS 11 – Fish Passage	\$19,000 ^a	Yes
FS 12 – Aquatic Habitat Mitigation	\$2,550	No
FS 13 – Fire and Fuels Management Plan	\$400	Yes

^a Cost based on annualized cost for Forest Service’s 4(e) condition and similar 30(c) conditions filed by FWS and Oregon DFW for this resource.

5.3.2 Resource Agencies’ 30(c) Conditions

We discuss the preliminary 30(c) conditions submitted by FWS and Oregon DFW in the following subsection. We note that section 30(c) of the FPA provides that any license or exemption issued by the Commission for a facility which meets the qualifying criteria for a new dam or diversion²⁹ shall include “(1) such terms and conditions as the Fish and Wildlife Service, National Marine Fisheries Service, and the State agency each determine are appropriate to prevent loss of, or damage to, such resources and to otherwise carry out the purposes of such Act, and (2) such terms and conditions as the Commission deems appropriate to insure that such facility continues to comply with the provisions of this section and terms and conditions included in any such exemption.” Thus, any 30(c) condition that meets the requirements of the law must be included in any license issued by the Commission, regardless of whether we include the condition in our Staff Alternative.

²⁹ 18 C.F.R. §292.202(p) (2019).

5.3.2.1 FWS 30(c) Conditions

Of FWS’s 18 preliminary conditions, we consider 7 of the conditions (conditions 1-3, 7, 12, 15, and 16) to be administrative or legal in nature and not specific environmental measures. We therefore, do not analyze these conditions in this EA. Table 12 summarizes our conclusions with respect to the 11 remaining preliminary 30(c) conditions that we consider to be environmental measures. We include in the Staff Alternative all but 2 of the 11 preliminary conditions specified by FWS.

5.3.2.2 Oregon DFW 30(c) Conditions

Of Oregon DFW’s 15 preliminary conditions, we consider 5 of the conditions (conditions 1, 6, and 11 – 13) to be administrative or legal in nature and not specific environmental measures. We therefore, do not analyze these conditions in this EA. Table 12 summarizes our conclusions with respect to the 10 remaining preliminary 30(c) conditions that we consider to be environmental measures. We include in the Staff Alternative all but 2 of the 10 preliminary conditions specified by Oregon DFW.

Table 12. FWS and Oregon DFW preliminary section 30(c) for the proposed Rock Creek Project (Source: Staff).

Agency and Condition No.	Annualized Cost	Adopted in staff alternative?
FWS 4; Oregon DFW 3 – Minimum Flow/Mitigation for Fish Habitat	\$15,200/\$2,550	No
FWS and Oregon DFW 5 – Ramping Rates	\$0	Yes
FWS 6; Oregon DFW 4 – Operations and Maintenance Plan	\$500	Yes
FWS 8; Oregon DFW 9 – Terrestrial Wildlife Resource Management Plan	\$12,500	Yes
FWS 9; Oregon DFW – Erosion and Sediment Control	\$1,000	Yes
FWS 10; Oregon DFW 8 – Revegetation and Noxious Weed Management Plan	\$12,000 ^a	Yes
FWS 11; Oregon DFW 10 – Spring Connectivity and	\$1,000	No

Wetland Impacts		
FWS 13; Oregon DFW 2 – Downstream and Upstream Fish Passage	\$19,000 ^a	Yes
FWS 14 – Post-Construction Evaluation and Monitoring Plan	\$500	Yes
FWS 17; Oregon DFW 14 – Documentation of Bull Trout in Project Area	\$0	Yes
FWS 18; Oregon DFW 15 - Stream Crossing Prior Approval	\$500	Yes

^a Cost based on annualized cost for FWS’s and Oregon DFW’s 30(c) and a similar 4(e) condition filed by Forest Service for this resource.

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C. § 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 38 comprehensive plans that are applicable to the Rock Creek Project, located in Oregon (Appendix E). No inconsistencies were found.

6.0 FINDING OF NO SIGNIFICANT IMPACT

On the basis of our independent analysis, we find that the issuance of a license for the Rock Creek Project, with our recommended environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

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APPENDIX A – LICENSE CONDITIONS RECOMMENDED BY STAFF

On November 8, 2019, the U.S. Forest Service (Forest Service) filed preliminary 4(e) conditions containing 13 conditions (Appendix B). On November 12, 2019, U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS) and Oregon Department of Fish and Wildlife (Oregon DFW) filed preliminary 30(c) conditions containing 18 and 15 conditions, respectively (Appendix C and D, respectively).

I. MANDATORY CONDITIONS RECOMMENDED BY COMMISSION STAFF

We recommend including the measures stipulated by the following mandatory conditions in any license issued for the project:

Forest Service’s Conditions Nos. 7, 8, 9, 10, 11, 12, and 13.

FWS’s Conditions Nos. 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 17, 18

Oregon DFW’s Condition Nos. 2 3, 4, 5, 6, 7, 8, 9, 10, 14, and 15.

II. ADDITIONS TO MANDATORY CONDITIONS RECOMMENDED BY COMMISSION STAFF

We recommend the following additions to FWS’s and Oregon DFW’s conditions 11 and 10, respectively. This condition would require Warm Springs to identify locations for mitigation sites for any wetland habitats permanently altered by construction. We add to this condition that the project boundary would have to be modified to include any mitigation sites that may be required.

III. ADDITIONAL LICENSE ARTICLES RECOMMENDED BY COMMISSION STAFF

We recommend including the following additional license articles in any license issued for the project:

Article 4XX. Commission Approval, Notification, and Filing of Amendments.

(a) Requirement to File Plans for Commission Approval

Various conditions of this license found in the Oregon Department of Fish and Wildlife’s (Oregon DFW’S) final 30(c) conditions (Appendix D) require the licensee to prepare plans in consultation with other entities for approval by the Forest Service, FWS, Oregon DFW, and Oregon Department of Environmental Quality for submission to the

Commission and implement specific measures without prior Commission approval. Each such plan must also be submitted to the Commission for approval. The following table indicates the agencies that the licensee must consult before preparing the plans along with the deadline for filing the plans with the Commission for approval.

Oregon DFW Condition No.	Plan Name	Due Date
2.5	Post-Construction Evaluation and Monitoring Plan	At least 120 days prior to the completion of the upstream and downstream fish passage facilities
4	Operation and Maintenance Plan	within 6 months of license issuance

The licensee must include with each plan filed with the Commission documentation that the licensee developed the plan consultation with FWS and Forest Service and has received approval from Oregon DFW, FWS, and Forest Service, as appropriate. The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the plan becomes a requirement of the license, and the licensee must implement the plan or changes in project operations or facilities, including any changes required by the Commission.

(b) Requirement to File Reports

Certain conditions of Forest Service’s section 4(e) and FWS’s and Oregon DFW’s section 30(c) conditions require the licensee to file reports with other entities. Because these reports relate to compliance with the requirements of this license, each such report must also be submitted to the Commission. These reports are listed in the following table:

Forest Service Condition No.	FWS and Oregon DFW Condition Nos.	Description	Due date
8	10 and 8	Revegetation and Noxious Weed Management Plan	Within one month of completing annual monitoring activities
10	4 and 3	Gauge Location for Instream Flow Monitoring	Within three months following the close of each water year
Not applicable	17 and 14	Documentation of Bull Trout in the Project Area	As needed

The licensee must submit to the Commission documentation of any consultation, and copies of any comments and recommendations made by any consulted entity in connection with each report. The Commission reserves the right to require changes to project operations or facilities based on the information contained in the report and any other available information.

(c) Requirement to Notify Commission of Planned and Unplanned Deviations from License Requirements

The licensee may deviate from the mandatory conditions related to operations for short periods of time without prior Commission approval after concurrence from the conditioning agency/agencies. The licensee must file a report with the Secretary of the Commission as soon as possible, but no later than two weeks after the onset of the deviation. Each report must include: (1) the reasons for the deviation and whether operations were modified, (2) the duration and magnitude of the deviation, (3) any environmental effects, and (4) documentation of approval from the conditioning agency/agencies. For deviations from the mandatory conditions exceeding short periods of time, the licensee must file an application and receive Commission approval prior to implementation.

(d) Requirement to File Amendment Applications

Certain sections of the mandatory conditions in appendices B through D contemplate future unspecified changes to project construction, operations, or facilities. For example, Condition 4.3 of Appendix C contemplates allowing the licensee to mitigate for the loss of instream fish habitat in lieu of providing the minimum flows required by Condition 4.2. These changes may not be implemented until the licensee has filed an application to amend the license and the Commission has approved the application. In any amendment request, the licensee must identify related project requirements and request corresponding amendments or extensions of time as needed to maintain consistency among requirements.

Article 4XX. Run-of-River Operation. Run-of-river operation as required by Condition 10 of Appendix B, Condition 4.1 of Appendix C, and Condition 3.1 of Appendix D is defined as operating the project in a manner that at all times, acts to minimize the fluctuation of the reservoir surface elevation by maintaining a discharge from the project so that all outflows from the project approximate the sum of inflows to the project on an instantaneous basis.

Run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement among the licensee, Forest Service, FWS, Oregon DFW, and Oregon DEQ. If the run-of-river operation is so modified, the licensee must notify the Commission as soon as possible, but no later than 10 days after each such incident.

Article 4XX. Operation Compliance Monitoring Plan. At least 90 days before the start of project operation, the licensee must file, for Commission approval, an operation compliance monitoring plan that describes how the licensee will document compliance with the operational requirements of this license.

In addition to the gaging requirements stipulated by Condition 10 of Appendix B; Condition 4.5 of Appendix C, and 3.5 of Appendix D, the plan must include, but not necessarily be limited to, the following additional provisions:

(1) a provision to monitor compliance with operating the project in a run-of-river mode as stipulated by Article 4XX, Condition 10 of Appendix B, Condition 4.1 of Appendix C, and Condition 3.1 of Appendix D.

(2) a description of the steps the licensee will take to ensure run-of-river operation continues during planned and emergency shutdowns, including the reporting requirements of such deviations, as specified in Article 4XX (Commission Approval, Notification, and Filing of Amendments);

(3) a provision to monitor compliance with minimum flows and ramping rates as stipulated by Condition 10 of Appendix B; Conditions 4 and 5 of Appendix C; and Conditions 4 and 5 of Appendix D.

(4) a provision to monitor compliance with minimum flows and ramping rates as stipulated by Condition 10 of Appendix B; Conditions 4 and 5 of Appendix C; and Conditions 3 and 5 of Appendix D.

(5) a description of all gauges or recording devices that will be used to monitor operation compliance, including the method of calibration of each gauge and/or measuring device, and the frequency of recording;

(6) a provision to maintain a log of project operation;

(7) a provision for reporting any deviations during normal operation and in the event of an emergency, along with proposed actions that will be taken to avoid reoccurrence of the deviation; and

(8) an implementation schedule.

Article 4XX. Protection of Undiscovered Cultural Resources. If the licensee discovers previously undiscovered cultural resources during the course of constructing, maintaining, or developing project works or other facilities at the project, the licensee must stop all land-clearing and land-disturbing activities in the vicinity of the resource and consult with the Oregon State Historic Preservation Office (SHPO) and Forest Service (if involving their lands) to determine the need for any cultural resource studies or measures. If no studies or measures are needed, the licensee must file with the Commission documentation of its consultation with the Oregon SHPO and Forest Service (if involving their lands) immediately.

If a discovered cultural resource is determined to be eligible for the National Register of Historic Places (National Register), the licensee must file for Commission approval a historic properties management plan (HPMP) prepared by a qualified cultural resource specialist after consultation with the Oregon SHPO and Forest Service (if involving their lands). In developing the HPMP, the licensee must use the Advisory Council on Historic Preservation and the Federal Energy Regulatory Commission's *Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects*, dated May 20, 2002. The HPMP must include the following items: (1) a description of each discovered property, indicating whether it is listed in or eligible to be listed in the National Register; (2) a description of the potential effect on each discovered property; (3) proposed measures for avoiding, reducing, or mitigating

adverse effects; (4) documentation of consultation; and (5) a schedule for implementing mitigation and conducting additional studies. The Commission reserves the right to require changes to the HPMP.

The licensee must not resume land-clearing or land-disturbing activities in the vicinity of a cultural resource discovered during construction, maintenance, or removal of project facilities, until informed by the Commission that the requirements of this article have been fulfilled.

Article 4XX. Protection of Cultural Resources. Prior to implementing any project modifications not specifically authorized by this license, including but not limited to, land-clearing or land-disturbing activities, or changes to project operation or facilities, the licensee must consult with the Oregon State Historic Preservation Office (SHPO) and Forest Service (if on their lands) to determine the effects of the activities and the need for any cultural resource studies or measures. If no studies or measures are needed, the licensee must file with the Commission documentation of its conclusion with the Oregon SHPO and Forest Service (if involving their lands).

If a project modification is determined to affect a historic property, the licensee must file for Commission approval a historic properties management plan (HPMP). The HPMP must be prepared by a qualified cultural resource specialist after consultation with the Oregon SHPO. In developing the HPMP, the licensee must use the Advisory Council on Historic Preservation and the Federal Energy Regulatory Commission's *Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects*, dated May 20, 2002. The HPMP must include the following items: (1) a description of each historic property; (2) a description of the potential effect on each property; (3) proposed measures for avoiding or mitigating adverse effects; (4) documentation of the nature and extent of consultation; and (5) a schedule for implementing mitigation and conducting additional studies. When filing the HPMP for Commission approval, the licensee must include any documentation of consultation with the Oregon SHPO and Forest Service (if involving their lands) during development of the HPMP. The Commission reserves the right to require changes to the HPMP. The licensee must not implement any project modifications, other than those specifically authorized in this license, until informed by the Commission that the requirements of this article have been fulfilled.

Article 4XX. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee must have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and

other environmental values of the project. For those purposes, the licensee must also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee must take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee must: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project

overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee must file with the Commission a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee must consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee must determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed must not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee must take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee must not unduly restrict public access to project lands or waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project must be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article must not apply to any part of the public lands and reservations of the United States included within the project boundary.

**APPENDIX B – USDA FOREST SERVICE FEDERAL POWER ACT
PRELIMINARY SECTION 4(e) TERMS AND CONDITIONS**

Date filed: November 8, 2019

**Rock Creek Project
FERC Project No. 12726**

**PRELIMINARY LICENSE TERMS AND CONDITIONS
FOR THE
ROCK CREEK HYDROELECTRIC PROJECT, FERC NO. 12726
WARM SPRINGS HYDRO, LLC**

I. INTRODUCTION

USDA Forest Service (FS) submits the following Preliminary Section 4(e) Conditions for the Rock Creek Hydroelectric Project, FERC No. 12726, in accordance with 18 CFR 4.34(b)(1)(i). Section 4(e) of the Federal Power Act (FPA), states the Commission may issue a license for a project within a reservation only if it finds that the License will not interfere or be inconsistent with the purpose for which such reservation was created or acquired. This is an independent threshold determination made by the Commission, with the purpose of the reservation defined by the authorizing legislation or proclamation (see *Rainsong v. FERC*, 106 F.3d 269 (9th Cir. 1977)). Section 4(e) also states that any License issued by the Commission shall be subject to such conditions as the Secretary of the department under whose supervision such reservation falls shall deem necessary for the adequate protection and utilization of the reservation. In making its determination, the FS may rely on broader purposes than those contained in the original authorizing statutes and proclamations in prescribing conditions (see *Southern California Edison v. FERC*, 116F.3d 507 (D.C. Cir. 1997)).

The following terms and conditions are based on those resource and management requirements enumerated in the Organic Administration Act of 1897 (30 Stat. 11), the Multiple-Use Sustained Yield Act of 1960 (74 Stat. 215), the National Forest Management Act of 1976 (90 Stat. 2949), and any other law specifically establishing a unit of the National Forest System (NFS) or prescribing the management thereof (such as the Wild and Scenic Rivers Act), as such laws may be amended from time to time, and as implemented by regulations and approved by Land and Resource Management Plans prepared in accordance with the National Forest Management Act. Specifically, the 4(e) conditions in this document are based on the Land and Resource Management Plan (as amended) for the Wallowa-Whitman National Forest, as approved by the Regional Forester of the Pacific Northwest Region.

Pursuant to Section 4(e) of the Federal Act, the Secretary of Agriculture, acting by and

through the FS, considers the following conditions necessary for the adequate protection and utilization of the land and resources of the Wallowa-Whitman National Forest. License articles contained in the Commission's Standard Form L-17 (revised October 1975) issued by Order No. 540, dated October 31, 1975, cover general requirements. Part II of this document includes administrative conditions deemed necessary for the administration of NFS lands, and Part III of this document includes Project specific resource conditions necessary for the protection and utilization of NFS lands and resources.

II. ADMINISTRATIVE CONDITIONS

Condition No. 1- Requirement to Obtain a Forest Service Special Use Authorization

Within 6 months of license issuance and prior to undertaking any ground disturbing activities on NFS lands, the Licensee shall acquire a special use authorization (SUA) from the FS for the occupancy and use of NFS lands included within the licensed project boundary. The SUA shall be filed with the Commission. The Licensee shall be responsible for the costs of collecting all information directly related to the evaluation of the effects of the proposed occupancy and use of NFS lands that the FS needs in order to make a decision concerning issuance of the SUA (36 CFR Part 251.58).

Condition No. 2 - Reservation of Authority

The FS reserves the right, after notice and opportunity for comment, to require changes in the Project and its operation through revision of the Section 4(e) conditions to accomplish protection and utilization of NFS lands and resources. The FS also reserves the right to modify these conditions, if necessary, to respond to any significant changes that warrant a revision of these conditions, including but not limited to, a Final Biological Opinion issued for this Project by the National Marine Fisheries Service or United States Fish and Wildlife Service; or any Certification issued for this Project by the Oregon State Department of Environmental Quality.

Condition No. 3 - Surrender of License

Prior to any surrender of this license, Licensee shall provide assurance acceptable to the FS that Licensee shall restore any project area on or directly affecting NFS lands to a condition satisfactory to the FS upon or after project decommissioning and surrender of the license, as appropriate. To the extent restoration is required, Licensee shall prepare a restoration plan for FS approval, which identifies the measures to be taken to restore such NFS lands and shall include adequate financial mechanisms to ensure performance of the restoration measures. If deemed necessary by the FS, Licensee shall conduct an analysis, using experts approved by the FS, to estimate the potential costs associated with

surrender, including project decommissioning and restoration of NFS lands affected by decommissioning of the project to FS specifications.

Condition No. 4 – Transfer of License

In the event of any transfer of the license of the project, Licensee shall assure that, in a manner satisfactory to the FS, either the Licensee or transferee will provide for the costs of surrender and restoration.

In addition, the FS may require Licensee to pay for an independent audit of the transferee to assist the FS in determining whether the transferee has the financial ability to fund directly and/or post a bond to ensure the surrender and restoration work specified in the analysis can be completed.

Within 6 months following transfer of the license, the transferee will be required to obtain a FS SUA for the use and occupancy of NFS lands, if determined necessary by the FS authorizing officer.

Condition No. 5 - Annual Consultation

The Licensee shall annually consult with the FS, regarding Licensee's activities on, or directly affecting, NFS lands. The date of the consultation meeting will be mutually agreed to by Licensees and FS but in general should be held prior to March 15. At least 30 days in advance of the meeting, the Licensee shall also provide notice to the Oregon Department of Environmental Quality (ODEQ), Oregon Department of Fish and Wildlife (ODFW), Oregon Water Resources Department (OWRD), and US Fish and Wildlife Service (USFWS), who may choose to participate in the meeting. The Licensee shall attempt to coordinate the meeting so interested agencies and other stakeholders may attend.

Licensee shall make the following information available to FS and other meeting participants at least 30 days prior to the meeting:

- i. An operations plan for the year in which the meeting occurs, including planned outages.
- ii. A description of planned maintenance projects for the year in which the meeting occurs.
- iii. Any records of non-compliance with the License.
- iv. The hydrology record for the previous year, if available, including any variances.
- v. Results of any monitoring conducted the previous year in formats agreed to by the FS and Licensees during development of implementation plans.

- vi. A written status report detailing compliance with the Project’s Final 4(e) Conditions and any 10(a) Recommendations included in the license. The report shall include a summary of each of the FS conditions and a statement indicating how the Licensees met the condition during the previous year.
- vii. Safety reports, including geologic and seismic reports.
- viii. List of Section 4(e) Conditions that require action in the year in which the meeting occurs

Consultation meeting shall include, but not be limited to:

- i. Discussion of the documents provided to the FS and other meeting participants prior to the meeting.
- ii. Review of any non-routine maintenance.
- iii. Discussion of any foreseeable changes to Project facilities or features.
- iv. Discussion of any necessary revisions or modifications to implementation plans approved as part of this license.
- v. Discussion of needed protection measures for species newly listed as threatened, endangered, or sensitive, or changes to existing management plans that may no longer be warranted due to delisting of species or, to incorporate new knowledge about a species requiring protection.
- vi. Discussion of any climate change effects on Project operations, and implications for NFS lands and resources.
- vii. Discussion of needed protection measures for newly discovered cultural resource sites.
- viii. Discussion of any planned pesticide use.

A record of the meeting shall be kept by Licensees and shall include any recommendations made by FS for the protection of NFS lands and resources. Licensees shall file the meeting record, if requested, with the Commission no later than 60 days following the meeting.

Condition No. 6 - Implementation of Activities on NFS lands.

A. Approval of Changes on NFS Lands after License Issuance. Notwithstanding any License authorization to make changes to the Project, the Licensee shall receive written approval from the FS prior to making changes in the location of any constructed Project features or facilities on NFS lands, or in the uses of Project land and waters on NFS lands, or any departure from the requirements of any approved exhibits for Project facilities located on NFS lands filed by the Licensee with the Commission. Following receipt of such approval from the FS, and at least 60 days prior to initiating any such changes or departure, the Licensee shall file a report with the Commission describing the

changes, the reasons for the changes, and showing the approval of the FS for such changes. The Licensee shall file an exact copy of the report with the FS at the time it is filed with the Commission.

B. Coordination with Other Authorized Uses on NFS Lands. In the event that portions of the Project area are under federal authorization for other activities and permitted uses, the Licensee shall consult with the FS to coordinate such activity with authorized uses before starting any activity on NFS land that the FS determines may affect another authorized activity.

C. Site-Specific Plans. The Licensee shall prepare site-specific plans subject to review and approval by the FS for habitat and ground-disturbing activities on NFS lands affected by the Project required by the License, including activities contained within resource management plans required by the License prepared subsequent to License issuance. The Licensee shall prepare site-specific plans for planned activities be submitted to the FS as required by the License unless otherwise directed by FS. For activities planned in the first year after License issuance, the Licensee shall provide the site-specific plans to the FS sufficiently in advance of implementation to allow FS review and approval of site-specific plans prior to implementation. For emergency situations, where corrective or mitigation actions must be implemented immediately, the Licensee will coordinate with the FS to expedite approvals and/or permits.

Site-specific plans shall include:

1. A map depicting the location of the proposed activity, the total acres impacted, and GPS coordinates.
2. A description of the FS land management area designation for the location of the proposed activity, the source where the description was obtained, and applicable standards and guidelines.
3. When deemed necessary by the FS, a description of alternative locations, designs and mitigation measures considered including erosion control and implementation and effectiveness monitoring designed to meet applicable standards and guidelines.
4. When deemed necessary by the FS, draft biological evaluations or assessments including survey data as required by regulations applicable to habitat or ground-disturbing activities on NFS lands in existence at the time the plan is prepared.
5. When deemed necessary by the FS, an environmental analysis of the proposed action consistent with the FS policy and regulations for implementation of the National Environmental Policy Act (NEPA) in existence at the time the plan is

prepared for FERC Licensed projects on NFS lands. Environmental Analysis completed by FERC or others may be relied upon as appropriate on a project specific basis as agreed to by FS.

D. Crossings

Licensee shall maintain suitable crossings as required by the FS for all roads and trails that intersect the right-of-way occupied by linear Project facilities (powerline, penstock, ditch, and pipeline).

E. Surveys, Land Corners

Licensees shall avoid disturbance to all public land survey monuments, private property corners, and forest boundary markers. In the event that any such land markers or monuments on NFS Lands are destroyed by an act or omission of the Licensee, in connection with the use and/or occupancy authorized by this license, depending on the type of monument destroyed, Licensee shall reestablish or reference same in accordance with (1) the procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States," (2) the specifications of the County Surveyor, or (3) the specifications of the FS. Further, Licensee shall ensure that any such official survey records affected are amended as provided by law.

F. Signs

The Licensee shall consult with the FS prior to erecting signs related to safety issues on NFS lands covered by the license. Prior to Licensees erecting any other signs or advertising devices on NFS lands covered by the license, Licensees must obtain the approval of FS as to location, design, size, color, and message. Licensees shall be responsible for maintaining all Licensee-erected signs to neat and presentable standards.

III. PROJECT SPECIFIC RESOURCE PROTECTION AND UTILIZATION CONDITIONS

Condition No. 7 - Erosion and Sediment Control Plan

Prior to undertaking any ground disturbing work on NFS lands, the Licensee shall finalize the Erosion and Sediment Control Plan (ESCP) proposed in Appendix B of the FLA and submit the plan to the FS for approval. Following approval by the FS the

Licensee shall file the plan with the Commission. Upon Commission approval, the Licensee shall implement the plan.

The Final ESCP shall include measures A through D below.

A. For three (3) years following completion of Project construction, the Licensee shall monitor sediment and erosion control measures for compliance with performance measures described below, as pertinent to the following areas: diversion, intake structure and buried pipeline

The Licensee shall ensure that (1) ground cover in disturbed areas equals or exceeds 80 percent of that in an undisturbed control area with similar vegetation and is adjacent to the Project area; and (2) species composition in disturbed areas equals or exceeds 75 percent non-weedy species. Soil erosion areas shall be reported if rills exceed two (2) inches in depth or six (6) inches in width. If soil erosion is reported, the Licensee shall implement erosion control measures consistent with the ESCP to remedy the erosion.

B. If re-vegetation requirements are not met within three (3) years post construction, the Licensee shall consult with the FS to identify and implement measures including, but not limited to reseeded, additional mulch, soil amendments and supplemental irrigation to ensure establishment of vegetation where required.

C. In the event of future construction activities associated with the Project, the Licensee shall consult with the FS 90-days before commencing any Project-related land-clearing, land disturbing, or spoil-producing activities, and incorporate the USDA FS recommendations into a comprehensive plan to control erosion, dust, and slope stability and to minimize the quantity of sediment or other potential water pollutants resulting from Project construction, spoil disposal, and Project operation and maintenance.

D. The Licensee shall report implementation and monitoring of erosion control actions in the Annual Report required in Condition No. 5 - Annual Coordination.

E. Follow FS standard best management practices at (https://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_Apri12012.pdf).

Condition No. 8 – Vegetation Management on NFS Lands

Prior to undertaking any ground disturbing work on NFS lands, the Licensee shall prepare a final Vegetation Management Plan (VMP) as proposed in Appendix B. 5 of the FLA and submit the plan to the FS for approval. Following approval by the FS the Licensee shall file the plan with the Commission. Upon Commission approval, the Licensee shall implement the plan.

The Final VMP shall include the following:

A. A map of all conifer and deciduous trees to be removed from the penstock right-of-way. The felled trees shall be used for penstock grade and soil erosion stabilization, and for large woody material on the forest floor adjacent to the penstock right-of-way.

B. The Licensee shall seed the penstock right-of-way including cut banks and out slopes with FS approved native plant species. The Licensee shall monitor the penstock right-of-way seeding area for three consecutive years to determine whether the seeding meets 80% plant establishment. If the native plant seeding does not meet the 80% criteria then the Licensee shall reseed with approved native plant species and monitor establishment for three more consecutive years.

Monitoring results shall be reported as described in Condition 5 - Annual Consultation, to determine future monitoring frequency needs.

C. The Licensee shall monitor for invasive plant species presence at the diversion structure, penstock route, and all other project works where ground-disturbing activities occur on NFS lands. Monitoring shall be conducted annually for the first three years post license issuance. Monitoring shall then occur once every other year, in years 5, 7 and 9. Monitoring results shall be reported as described in Condition 5 -Annual Consultation. In year 10, the FS shall determine continuing invasive plant species monitoring is required based on all previous monitoring information.

If monitoring identifies invasive plant species, the Licensee shall eradicate the plant species according to FS guidelines in effect at the time.

D. The Licensee shall implement the following BMPs to prevent the establishment or spread of invasive non-native plants in the Project area from Project-related activities (USDA FS Preventing and Managing Invasive Plants Record of Decision Standard, September 2005).

1. The Licensee shall implement a cleaning program for equipment and vehicles that involves power spraying with water to remove seeds, plant material, soil or mud.

The Licensee will inspect all equipment, including that used by subcontractors, to ensure that it is clean before it is allowed on project area job sites. In general, this program shall apply to the following:

- Nets, fish traps, and other field gear (waders, hip boots, buckets, etc.) used in waters outside of Rock Creek;
- Equipment used off of paved or gravel roads that arrive from locations outside the general vicinity; and
- Vehicles that have been used off of paved or gravel roads where known infestations of noxious weeds occur.

2. Construction and maintenance activities shall be limited to sites that are as small and as contained as possible to accomplish the activity at hand. To the extent possible, these sites will be placed in areas that have been disturbed previously, or where the existing weeds have been treated.

3. Sand, gravel, and other fill or borrow material used for construction activities generally contains seeds, roots, and other plant parts. This material can introduce new invaders and/or common invasive non-native plants that can quickly colonize disturbed sites. Materials used on FS sites must be inspected by a District or Forest weed specialist and judged to be weed free before use if weeds are found, material may be taken from a fresh face, or the contaminated layer excavated and set aside, and/or infested sources may be treated.

Condition No. 9 – Protection of Water Quality

The Licensee shall implement any and all Oregon Department of Environmental Quality 401 Water Quality Certification conditions for the portions of the bypass reach on NFS lands.

Condition No. 10 - Rock Creek Project Operation, Instream Flows and Gaging

Prior to undertaking any ground disturbing work on NFS lands, the Licensee shall prepare, in consultation with ODEQ, ODFW and USFWS, a final Project Flow

Operations Plan (PFOP) as proposed in Appendix B. 3 of the FLA and submit the plan to the FS for approval. Following approval by the FS the Licensee shall file the plan with the Commission. Upon Commission approval, the Licensee shall implement the plan.

The Final PFOB shall include the following:

1. The Licensee shall provide the instream flows set forth in Table 1.

Table 1. Instream flows (cfs) for Rock Creek as measured at the diversion structure.	
Month/Two Week Interval	Instream Flow (cfs)
January 1-15	6 cfs
January 16-31	6 cfs
February 1-15	6 cfs
February 16-28	6 cfs
March 1-15	6 cfs
March 16-31	8 cfs
April 1-15	10 cfs
April 16-30	12 cfs
May 1-15	20 cfs
May 16-31	20 cfs
June 1-15	20 cfs
June 16-30	15 cfs
July 1-15	15 cfs
July 16-31	15 cfs
August 1-15	12 cfs
August 16-31	12 cfs
September 1-15	7 cfs
September 16-30	6 cfs
October 1-15	6 cfs
October 16-31	6 cfs
November 1-15	6 cfs
November 16-30	6 cfs
December 1-15	6 cfs
December 16-31	6 cfs

2. Run of River Operation

The Licensee shall operate the Project in run-of-river mode during all times of generation. The automated control system equipment will be set to divert no more than the licensee's total water right for Project. In addition, upon license issuance, the Project shall ensure a continuous minimum flow from the Rock Creek Hydroelectric Project

diversion structure into the Rock Creek bypass reach, as set forth in Table 1, to protect fish and wildlife resources and habitat. If natural inflow to the Project is equal to or less than the required minimum flow, then the project shall cease diversion of stream flow and all water shall remain in Rock Creek.

3. Ramping Rates

The Licensee shall operate the Project to minimize Project-induced flow fluctuations in the Rock Creek bypass reach. The Licensee shall operate the Project to adhere to ramping restrictions in the bypass reach. For redband trout, not to exceed 1-inch per hour from May 1 to October 31 to protect larval fish and 2 inches per hour from November 1-April 30 to protect juvenile and adult rearing. Ramp rates shall apply during all Project start up or shut down activities. Ramping rates shall be measured at the point of diversion as described in (3) below.

4. Gage Location for Instream Flow Monitoring

The Licensee shall install and maintain a gauging station at the diversion weir. The flow gage shall provide for continuous real time recording of flow and stage in the bypass reach measured at 15-minute intervals and reported as an hourly average (top of the hour average) during the duration of the hydropower license. Flow and stage data shall be available to the ODFW, ODEQ, Oregon Water Resources Department (OWRD), and FS through a real-time or other reporting system approved by the FS. Additional flow data, including but not limited to: historical values for hourly, daily, monthly, and yearly time periods; and including measurements of stream flow and gage height used to supplement and/or verify the accuracy of the automatically recorded observations, shall be provided to the Agencies as electronic spreadsheet files or other format agreeable to the requesting agency and the licensee within the target of three to five business days of the request to the licensee. The licensee shall develop rating curves to enable accurate flow measurements at flows up to a level that is greater than or equal to bank-full stage at the gage location. The flow gage shall be established in conformance with U.S. Geological Survey (USGS) criteria and maintained through the life of the project license. Regular maintenance and calibration of the gage shall be performed by the licensee or an agreed upon agency including OWRD, USGS, or other reputable contractor. Within three (3) months following the close of each water year during the term of the new License, the Licensee shall provide to the USFWS, ODFW, and FS a written report of the daily average flow records for the preceding water year.

Condition No. 11 – Fish Passage

Prior to undertaking any ground disturbing work on NFS lands, the Licensee shall prepare, in consultation with the USFWS and ODFW, a final Fish Passage Plan (FPP) that will require the Licensee to design, construct, operate, and maintain facilities proposed on Page 8 of the FLA and in and Exhibit F-4 and F-5 of the FLA over the term of the license. Upstream passage facilities shall meet the criteria established by ODFW in OAR 635-412-0035. Downstream facilities including screens shall meet the criteria established by the National Marine Fisheries Service (Anadromous salmonid passage facility guidelines and criteria developed by the National Marine Fisheries Service, Northwest Region, Portland, Oregon. 2011 Available online at http://www.nwr.noaa.gov/1hydrop/hydroweb/docs/release_draft.pdf). The Final FPP shall be submitted to the FS for approval. Following approval by the FS, the Licensee shall file the plan with the Commission. Upon Commission approval, the Licensee shall implement the plan.

Condition No. 12 – Aquatic Habitat Mitigation

Prior to undertaking any ground disturbing work on NFS lands, the Licensee shall prepare, in consultation with ODFW, ODEQ, OWRD and USFWS, a final Aquatic Habitat Mitigation Plan (AHMP) as proposed in Appendix B of the FLA. The Final AHMP shall be submitted to the FS for approval. Following approval by the FS, the Licensee shall file the plan with the Commission. Upon Commission approval, the Licensee shall implement the plan.

The AHMP shall require the Licensee to implement measures which shall offset the reduction in aquatic habitat within that portion of the bypass reach located on NFS lands caused by operation of the Project over the term of the new license. The final AHMP shall include:

- A) Additional site selection criteria which establish a preference for in proximity, in kind, measures located on NFS lands.
- B) Procedures for maintaining and monitoring the effectiveness of mitigation sites over the term of the license, including selection of additional sites if necessary, to meet the goal of offsetting project impacts to habitat in the bypass reach.
- C) Procedures for reducing diversion of flow during circumstances of warm air temperature and low flow when the operation of the project is likely to cause an increase of water temperature of more than 0.5 °F in the bypass reach (FLA Pg. 63).

Condition No. 13– Fire Management and Response Plan

Within one year of license issuance, Licensee shall complete, in consultation with the FS and approved by the FS, a Fire and Fuels Management Plan (FFMP) and file the with the Commission. The plan shall set forth in detail the Licensee’s responsibility for the prevention (including fuels treatment), reporting, emergency response, and investigation of fires related to Project operations. Upon Commission approval, the Licensee shall implement the Plan.

Minimum components include, but shall not be limited to:

- Fuels Treatment/Vegetation Management: Identification of fire hazard reduction measures and reoccurring maintenance measures to prevent the escape of project-induced fires.
- Fire Prevention and Patrol: Address fire danger and public safety associated with project induced recreation, including fire danger associated with dispersed camping, existing and proposed developed recreation sites, trails, and vehicle access. Identify water drafting sites and other fire suppression resources.
- Emergency Response Preparedness: Analyze fire prevention needs including equipment and personnel availability.
- Reporting: Licensee shall report any project related fires immediately to FS.
- Fire Control/Extinguishing: Provide FS a list of the locations of available fire suppression equipment and the location and availability of fire suppression personnel.

**APPENDIX C – U.S. FISH AND WILDLIFE SERVICE PRELIMINARY 30(C)
MANDATORY CONDITIONS**

Date filed: November 12, 2019

As the Applicant intends to seek benefits under § 210 of the Public Utility Regulatory Policy Act of 1978 (PURPA), the U.S. Fish and Wildlife Service (USFWS (along with the National Marine Fisheries Service (NMFS) and Oregon Department of Fish and Wildlife) have mandatory conditioning authority under § 30(c) of the FPA. A new license application granted for a small hydroelectric power project qualifying for PURPA benefits requires inclusion in the license of all terms and conditions that are prescribed by state and Federal fish and wildlife agencies to prevent loss of, or damage to, fish and wildlife resources, and to otherwise carry out the purposes of the Fish and Wildlife Coordination Act, pursuant to 18 CFR 4.106(b).

These Terms and Conditions are based on current information regarding the proposed licensing of the Rock Creek Hydroelectric Project (Project). As more detailed plans are developed and Project operations begin under the new license, deficiencies may be observed and modifications to fish and wildlife protection and mitigation measures may be necessary. Modifications may also be necessary to finalize design plans or correct deficiencies or problems found during post- license monitoring and evaluations. Therefore, the USFWS reserves the right to amend these Section 30(c) terms and conditions as needed to be consistent with finalized design plans, incorporate new information developed as a result of the Commission’s environmental review process or any future relevant information, or to correct deficiencies or problems found during post-licensing monitoring or evaluations. This reservation should be included in any license issued for the Project.

The USFWS, has determined that the following terms and conditions shall be included in their entirety in any license the Commission issues for the Project.

1.0 Consultation with the USFWS and Annual Meeting

The Licensee shall, for the conservation and development of fish and wildlife resources, consult directly with the USFWS, U.S. Forest Service (USFS), ODFW, Oregon Department of Environmental Quality (ODEQ), Oregon Water Resources Department (OWRD), and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) (collectively referred to as stakeholders) regarding the completion of Project plans and designs for measures to protect, mitigate damages to, and enhance fish and

wildlife resources. The Licensee shall coordinate an annual meeting with the USFWS and other stakeholders, regarding Licensee's annual operations. The date of the consultation meeting will be mutually agreed to by Licensee and USFWS and other stakeholders, but in general, the meeting should be held by March 15 of each year.

The Licensee shall make the following information available to the USFWS and other stakeholders at least 30 days prior to the meeting:

- 1) An operations plan for the year in which the meeting occurs, including planned outages.
- 2) A description of planned maintenance projects for the year in which the meeting occurs.
- 3) Any records of non-compliance with the License.
- 4) The hydrology record for the previous year, if available, including any variances.
- 5) Results of any monitoring conducted the previous year during development of implementation plans.
- 6) A written status report detailing compliance with the Project's 30c Conditions included in the license. The report shall include a summary of each of the USFWS's conditions and a statement indicating how the Licensee met the condition during the previous year.
- 7) Safety reports, including geologic and seismic reports.
- 8) List of 30(c) Conditions that require action in the year in which the meeting occurs.
- 9) Reporting of bull trout observed or collected in the Project area. The data will include; a) number of bull trout, b) size (length), c) location (GPS if available), d) if the bull trout were alive or dead, e) date, and f) name of person that observed the fish (Refer to Term and Condition No.17).

The consultation meeting shall include, but not be limited to:

- 1) Discussion of the documents provided to the USFWS and other stakeholders prior to the meeting.
- 2) Review of any non-routine maintenance.
- 3) Discussion of any foreseeable changes to Project facilities or features.
- 4) Discussion of any necessary revisions or modifications to implementation plans

or minimum flows approved as part of this license.

- 5) Discussion of needed protection measures for species newly listed as threatened, endangered, or sensitive, or changes to existing management plans that may no longer be warranted due to delisting of species or, to incorporate new knowledge about a species requiring protection.
- 6) Discussion of any climate change effects on Project operations, and implications for USFS lands and resources.

A record of the meeting shall be kept by Licensee and shall include any recommendations made by the USFWS and stakeholders for the conservation and development of fish and wildlife resources. The Licensee shall file the meeting record, if requested, with the Commission no later than 60 days following the meeting.

Rationale: Detailed plans and designs remain to be finalized for some of the Project's proposed facilities and operations. Accordingly, post-licensing discussions with the USFWS and the other affected resource agencies will be required. Therefore, any new license issued by the Commission should include a general requirement for the Licensee to consult with the USFWS, USFS, ODFW, ODEQ, OWRD, and CTUIR regarding the completion of proposed and future plans and designs for measures to protect, mitigate damages to, and enhance fish and wildlife resources. In relation to endangered and threatened species and their critical habitat, this requirement is consistent with the Commission's duty under section 7(a)(1) of the ESA to carry out programs for the conservation of listed species in consultation with the USFWS.

The USFWS, USFS, ODFW, ODEQ, OWRD, and CTUIR have considerable expertise, experience, authorities, and responsibilities associated with natural resource management, and fishway system design, evaluations, maintenance, and operations. To ensure these expert entities are afforded opportunity to participate in development of Project plans, schedules and designs, a design review procedure will be instituted for any plans proposed by the Licensee or its agent(s) that affect fish and wildlife resources and their habitats. Thus, as the Licensee or its agent(s) develop Project plans, schedules, designs, the USFWS requires the Licensee to consult with the USFWS and other stakeholders on Project plans affecting fish and wildlife resources.

The Licensee will develop an Annual Report for each resource management plan to describe the Licensee's current year's progress as well as proposed plans for the upcoming year. Consistent and regularly scheduled reporting allows the Parties to stay abreast of the progress in implementing the New License, and ensure adequate and timely coordination between the Licensee and the USFWS, allowing the USFWS to

determine if required actions are implemented in a timely and successful manner, and evaluate whether the Licensee is adequately planning for timely implementation of future license requirements. While there is no specified deadline for the annual report to be completed, the USFWS expects such reporting would occur prior to February 15 of each year to allow for timely discussion of the previous year's actions and upcoming actions in the subsequent year (30 days prior to March 15 meeting). Each Annual Report would summarize the completed activities and the Project's future activities, including coordination, reviews, and approvals by the Parties and the Commission. Finally, each Annual Report would provide a tracking device to compare license articles and actual accomplishments. Thus, the USFWS requires the Licensee consult directly with the USFWS, USFS, ODFW, ODEQ, OWRD, and CTUIR regarding the completion of Project plans and designs for measures to protect, mitigate damages to, and enhance fish and wildlife resources. The Licensee shall coordinate an annual meeting with the USFWS and other stakeholders, regarding Licensee's annual operations.

2.0 Emergency or Special Conditions

In the event that an accidental spill of reportable quantity of a hazardous material, as defined by ODEQ, or other potential emergency event occur, the Licensee shall notify the Oregon Emergency Response System within 24-hours of the event with a verbal report on location, duration, and effect on water quality and aquatic life.

If at any time, unanticipated circumstances or emergency situations arise in which the Licensee observes or suspects that fish or wildlife are killed, harmed or endangered by any of the Project facilities or as a result of Project operation, the Licensee shall immediately take appropriate action to prevent further loss in a manner that does not pose a risk to human life, limb, or property. The Licensee shall, within 24-hours, notify ODEQ, ODFW, OWRD, USFS, and the USFWS, as appropriate, and comply with any restorative measures required to the extent such measures do not conflict with the conditions of this license. The Licensee shall notify the Commission as soon as possible but no later than 10-days after each occurrence and inform the Commission as to the nature of the occurrence and restorative measures taken, as well as preventative measures to ensure similar incidents do not occur in the future.

Rationale: The New License should include conditions that require the Licensee to notify the appropriate fish and wildlife agency when emergency or special situations at Project facilities caused harm or mortality to fish and wildlife species or their habitats. Such notification allows rapid agency response to emergency and special

situations, and allows the USFWS to document take of ESA-listed species, if any, and determine whether a site visit is needed to further assess impacts to fish and wildlife potentially caused by such situations. Thus the USFWS requires the Licensee to notify the Oregon Emergency Response System (and ODEQ, ODFW, OWRD, USFS, and the USFWS) within 24-hours of the emergency event with a verbal report on location, duration, and effect on water quality and aquatic life, and comply with any restorative measures required to the extent such measures do not conflict with the conditions of this license.

3.0 Endangered Species Act Section 7 Consultation Reopener

The Licensee shall, for the conservation and development of fish and wildlife resources, comply with such reasonable modifications of the Project structures and operation as may be ordered by the Secretary of the Interior under Section 7(a)(2) of the ESA. These may include Project modifications needed to comply with the ESA during formal consultation or following any re- initiation of ESA section 7 consultation, or other modifications as determined by the Secretary to ensure full compliance with the requirements of the ESA during the term of the new license.

Rationale: In accordance with the requirements of section 7(a)(2) of the ESA, the Commission is required to ensure that its action of issuing a license does not jeopardize the continued existence of listed species or destroy/ adversely modify critical habitat. Consistent with that duty, re- initiation of consultation is also required after a Federal action has been initiated if certain conditions are met as described at 50 CFR Part 402.16 and where discretionary Federal involvement or control over the action has been retained or is authorized by law. Given the Commission's on-going responsibilities for license compliance, dam safety, and license modifications, we encourage the Commission to recognize the need to protect ESA-listed species and their critical habitat during the term of the new license, and retain full discretionary control and involvement over any new license. This specific ESA reopener provision, together with other appropriate reservations of authority, retains the Secretary of the Interior's authority to require license amendments or Project modifications to comply with the ESA following the re-initiation of ESA section 7 consultation, and sufficient discretionary involvement or control with respect to Project construction, operation, maintenance and modification under the new license, or any amendments.

4.0 Minimum Flow and Mitigation for Fish Habitat Impacts

4.1 Project Operation.

The Licensee shall operate the Project in run-of-river mode during all times of generation. The automated control system equipment will be set to divert no more than the licensee’s total water right for the Project (Cert. 4120), provided the established minimum flows are met. The hydraulic capacity of the Project is 13 cfs.

Rationale: The Applicant has proposed the Project to operate in run-of-river mode during all times of operation. The Applicant has agreed with the USFWS and other stakeholders to: 1) meet either the minimum flows established by ODFW or minimum flows agreed to as part of a mitigation plan, 2) withdraw water up to 13 cfs from Rock creek into the Project pipeline, and 3) ensure any additional water above minimum flow plus 13 cfs will remain as instream flow. If the Project deviates from this operation, the Project will not be in compliance with the license and then the Applicant shall cease diverting streamflow and all water shall remain in Rock Creek. Thus, the USFWS requires the Licensee to implement the Project in run-of-river mode during all times of generation and first meet minimum flows before diverting flows for generation.

4.2 Minimum Flows without Mitigation.

The Licensee shall ensure a continuous minimum flow from the Project diversion structure into the Rock Creek bypass reach that meets ODFW’s 1992 recommended flows in IS 72194 (see Table 1) until and unless mitigation is approved and completed for the loss of fish habitat (see Recommendation 4.3). The flow recommendations in IS 72194 are the minimum required flows necessary to maintain salmonid populations at their current levels for the purposes of fish migration, spawning, egg incubation, fry emergence and juvenile rearing. These minimum flows shall be provided upon diversion of any water for hydroelectric purposes under this license. If natural inflow to the Project is equal to or less than the required minimum flow, then the Licensee shall cease diverting streamflow and all water shall remain in Rock Creek. These minimum flows may be increased if necessary to meet the requirements of ODEQ’s future water quality certification and water quality criteria.

Table 1. Recommended instream flows from Application for Instream Water Right (IS 72194) by Oregon Department of Fish and Wildlife dated January 8, 1992.	
Month/Two Week Interval	Instream Flow (cfs)
January 1-15	9 cfs
January 16-31	9 cfs
February 1-15	9 cfs
February 16-28	15 cfs

March 1-15	20 cfs
March 16-31	20 cfs
April 1-15	20 cfs
April 16-30	20 cfs
May 1-15	20 cfs
May 16-31	20 cfs
June 1-15	20 cfs
June 16-30	15 cfs
July 1-15	12 cfs
July 16-31	12 cfs
August 1-15	9 cfs
August 16-31	9 cfs
September 1-15	9 cfs
September 16-30	9 cfs
October 1-15	9 cfs
October 16-31	9 cfs
November 1-15	9 cfs
November 16-30	9 cfs
December 1-15	9 cfs
December 16-31	9 cfs

Rationale: The USFWS and stakeholders have agreed to the Project use of these IS 72194 minimum flows if a Fish Habitat Mitigation Plan is not in place. The flow recommendations in IS 72194 are the minimum required flows necessary to maintain salmonid populations at their current levels for the purposes of fish migration, spawning, egg incubation, fry emergence and juvenile rearing. Additional data on temperature may indicate additional minimum flows are needed to support fish habitat during low flow periods. Thus, the USFWS requires the Licensee to provide the IS-72194 minimum flows displayed in Table 1, if a Fish Habitat Mitigation Plan is not complete for the Project.

4.3 Mitigation Loss of Fish Habitat.

If the Licensee chooses to mitigate for the loss of instream fish habitat in lieu of providing flows under Recommendation 4.2, the Licensee shall revise the Fish Habitat Mitigation Plan in Appendix B of the Final License Application (FLA) (Mitigation Plan) consistent with ODFW Fish and Wildlife Habitat Mitigation Policy goals and objectives for Habitat Category 4 (see OAR 635, Division 415).

The Licensee shall revise the Mitigation Plan to identify the Project's impact and mitigation project(s) as described below in A through C, consistent with ODFW Fish and Wildlife Habitat Mitigation Policy mitigation plan requirements pursuant to OAR 635-415-0020 (8).

The Licensee shall solicit participation from interested stakeholders including, but not limited to, the USFWS, USFS, ODFW, ODEQ, and OWRD, and schedule and convene one (or more) meeting(s) to discuss and agree upon revisions to the Mitigation Plan, including the Licensee's proposed mitigation project(s). The Licensee shall revise the Fish Habitat Mitigation Plan, as recommended by the stakeholders, and distribute to the stakeholders for review. The Licensee shall allow at least 30 days for stakeholder review and comment, and shall incorporate any recommended edits. Upon approval of the revised Mitigation Plan by the USFWS and other stakeholders, the Licensee shall submit the revised Mitigation Plan to the Commission for approval. Upon approval by the Commission, the Licensee shall implement the mitigation project(s) and monitor the mitigation project(s) to ensure habitat benefits are maintained through the term of the License.

- A. The revised Mitigation Plan shall address impacts to redband trout juvenile and adult rearing and spawning habitat, including:
 - a. The location, physical and operational characteristics and the duration of the development action (i.e. hydroelectric project);
 - b. The nature, extent and duration of the impacts expected to result from the proposed development action.
- B. The agreed-upon categories of acceptable mitigation projects include legal protection of instream flows, passage barrier improvements, and fish habitat restoration. The type or category of proposed mitigation will dictate the amount and extent of information necessary regarding the impact of the development action and the proposed mitigation project(s).
- C. The revised Mitigation Plan shall include a clear and detailed description of the proposed in-kind or out-of-kind, in-proximity or off-proximity mitigation project(s) including:
 - a. A detailed location of the proposed mitigation project(s) including coordinates (i.e. latitude, longitude, township, range, section, quarter section and county) and a map.
 - b. The benefits of proposed fish habitat mitigation project(s), including a clear and detailed explanation of how the proposed project(s) would result in no

- c. A comparison of the flow, amount and quality of the habitat at the mitigation site with the impacted site and;
- d. Protocols, methods, and a reporting schedule for monitoring the effectiveness of the mitigation project(s), and performance standards including success criteria and a timeline for formal determination that the mitigation goals and standards have been met and provisions for long-term protection and management of the mitigation site(s) and a reporting schedule for identifying progress toward achieving the mitigation goals and standards.

Rationale: The Fish Habitat Mitigation Plan provided by the Applicant is incomplete. Thus, the USFWS requires the Licensee to revise the Plan and coordinate this revision with the USFWS and other stakeholders including, but not limited, to the USFWS, USFS, ODFW ODEQ, and OWRD, to be consistent with ODFW’s Mitigation Policy.

4.4 Minimum Flows with Mitigation.

Upon completion of approved mitigation established under the revised Fish Habitat Mitigation Plan in Condition 4.3, the Licensee may adjust Project operation to ensure a continuous minimum flow (negotiated minimum flows) from the Rock Creek Hydroelectric Project diversion structure as set forth in Table 2, to protect fish and wildlife resources and habitat. If natural inflow to the Project is equal to or less than the required minimum flow, then the Licensee shall cease diverting streamflow and all water shall remain in Rock Creek.

Table 2. Instream flows (cfs) for Rock Creek as measured at the diversion structure (with mitigation).	
Month/Two Week Interval	Instream Flow (cfs)
January 1-15	6 cfs
January 16-31	6 cfs
February 1-15	6 cfs
February 16-28	6 cfs
March 1-15	6 cfs
March 16-31	8 cfs
April 1-15	10 cfs
April 16-30	12 cfs
May 1-15	20 cfs
May 16-31	20 cfs

June 1-15	20 cfs
June 16-30	15 cfs
July 1-15	15 cfs
July 16-31	15 cfs
August 1-15	12 cfs
August 16-31	12 cfs
September 1-15	7 cfs
September 16-30	6 cfs
October 1-15	6 cfs
October 16-31	6 cfs
November 1-15	6 cfs
November 16-30	6 cfs
December 1-15	6 cfs
December 16-31	6 cfs

Rationale: The USFWS, USFS, ODFW, ODEQ, and OWRD have negotiated with the Applicant that if these negotiated flows are the minimum flows applied to the Project, then a mitigation plan would be required for a no net loss of habitat. Thus, the USFWS allows the Licensee, upon completion of approved mitigation established under the revised Fish Habitat Mitigation Plan in Recommendation 4.3, to adjust Project operation to ensure a continuous minimum flow (negotiated minimum flows) from the Project diversion structure as set forth in Table 2. If natural inflow to the Project is equal to or less than the required minimum flow, then the Project shall cease diverting streamflow and all water shall remain in Rock Creek.

4.5 Minimum Flow Compliance Point.

The Licensee shall install and maintain a gauging station in the Rock Creek bypass reach. The gauging station shall be located at the diversion weir at the top of the bypass reach. The flow gauge shall provide for continuous real time recording of flow in the bypass reach measured at 15-minute intervals and reported as an hourly average (top of the hour average) during the duration of the hydropower license. The Licensee shall make flow data from the flow gauge (and any other sources) available to the USFWS, USFS, ODFW, ODEQ, and OWRD through the Licensee’s internet reporting system or another real-time reporting system. The Licensee shall provide any and all additional flow data, including but not limited to historical values for hourly, daily, monthly, and yearly time periods and including measurements of stream flow and gauge height used to supplement and/or verify the accuracy of the automatically recorded observations, to the USFWS, USFS, ODFW, ODEQ, and OWRD as electronic spreadsheet files or other format agreeable to the requesting agency and the Licensee, within five business days of the request to the Licensee.

The Licensee shall develop rating curves to enable accurate flow measurements at flows up to a level that is greater than or equal to bank-full stage at the gauge location. The Licensee shall establish the flow gauge in conformance with U.S. Geological Survey (USGS) criteria and the licensee shall maintain the flow gauge through the life of the Project license. Regular maintenance and calibration of the gauge shall be performed by the Licensee or an agreed-upon agency including OWRD, USGS, or other reputable contractor.

Prior to initial operation of the Project, the Licensee, in consultation with and subject to approval, by the USFWS, USFS, ODFW, ODEQ, and OWRD, shall prepare a gauge installation and data reporting plan. After approval by the USFWS, USFS, ODFW, ODEQ, and OWRD, the Licensee shall file the plan for Commission approval. Upon Commission approval, the Licensee shall implement the plan. Within three (3) months following the close of each water year during the term of the new License, the Licensee shall provide to the USFWS, USFS, ODFW, ODEQ, and OWRD a written report of the daily average flow records for the preceding water year. The Licensee shall include, at a minimum, the following in these reports: the amount of flow coming into the Project at the gauge, the amount of flow diverted into the Project, and the amount remaining in the stream below the Project diversion.

Rationale: The measurement of instream flow by the Licensee is necessary to ensure compliance with minimum flow requirements. The rating curve should accommodate a wide range of flows in order to provide information over the life of the license and the occurrence of flows that facilitate channel maintenance, sediment transport and other necessary ecosystem functions.

Relatively high flows generally occur in the Rock Creek reach May through June. Daily flow records will allow assessment of flow patterns over time and provide data that can be used to evaluate ecosystem function. Further, a long-term record of flow patterns will be particularly important to document the local effects of climate change.

Locating the instream flow compliance point within the reach occupied by redband trout and habitat for both redband and bull trout provides assurance that the benefit of the minimum flow requirement is being realized by the populations it is intended to benefit. Thus, the USFWS requires the Licensee to install and maintain a gauging station in the Rock Creek bypass reach. The gauging station shall be located at the diversion weir at the top of the bypass reach.

5.0 Ramping Rates

The Licensee shall operate the Project to minimize Project-induced flow fluctuations in the Rock Creek bypass reach. The Licensee shall operate the Project to adhere to ramping restrictions in the bypass reach. For redband trout, not to exceed 1-inch per hour from May 1 to October 31 to protect larval fish and 2 inches per hour from November 1-April 30 to protect juvenile and adult rearing. Ramp rates shall apply during all Project start up or shut down activities. The Licensee shall include procedures required to adhere to ramping rates in the Operation and Maintenance Plan identified in Term and Condition 6.

Rationale: Sudden flow changes in stream reaches due to Project operations can adversely impact fish and aquatic resources. Project operations can result in down-ramping in the Rock Creek bypassed reach by rapidly opening the headgate and diverting flow into the penstock, which reduces the flow over the diversion structure and into Rock Creek. Significant rapid flow reduction in the Rock Creek bypass reach could affect fish populations by stranding eggs, fry, or juvenile fish. Down ramping of only 1-inch per hour can impact fish populations (Hunter 1992). One very significant ramping event at a critical life history timing can cause a significant limiting condition (injury or death) for one or more age classes of fish, or impact long-term habitat conditions within a reach. Thus, the USFWS requires the Licensee to operate the Project to minimize Project-induced flow fluctuations in the Rock Creek bypass reach, and operate the Project to adhere to ramping restrictions in the bypass reach for redband trout, as described above.

6.0 Operation and Maintenance Plan

The Licensee shall develop a written Operation and Maintenance Plan (including operator training and supervision) that explicitly list the procedures needed to maintain minimum instream flows, adhere to specified ramping rates, and operate and maintain the upstream and downstream fish passage facilities. The Operation and Maintenance Plan should include procedures for prior notification and coordination with the USFWS regarding maintenance scheduling, a contingency plan for emergencies that affect fish and wildlife resources, and notification of the USFWS when minimum flow violations occur. The Licensee, in consultation with and subject to approval of, the USFWS, USFS, ODFW, ODEQ, and OWRD, shall prepare, and file for Commission approval, the Operation and Maintenance Plan. Upon Commission approval, the Licensee shall implement the plan.

Rationale: The Licensee proposes several operation and maintenance actions that will affect fish and aquatic resources such as minimum flow, upstream passage, and downstream passage. The FLA does not explicitly state how the Licensee will achieve its proposed actions. An Operation and Maintenance Plan reviewed and approved by the USFWS, USFS, ODFW, ODEQ, and OWRD, will help ensure that impacts to fish and aquatic resources are minimized.

Fish passage systems are subject to continuous operations and harsh riverine and climatic conditions. Because redband trout spawning and rearing habitat is present in Rock Creek at the proposed fishway facilities, proper maintenance of the fish passage systems is necessary to ensure the movement of fish in completing their biological requirements, including fish migration, spawning, egg incubation, fry emergence, and juvenile rearing (NMFS 2011).

Effective operation and performance of the Project's fish passage systems are dependent on regular inspection and maintenance to assure proper operating conditions within each fish passage feature. Wear and tear, corrosion, accumulation of sediment and debris, and various other factors decrease the effectiveness of the fishway's physical features. If left untreated, these factors would increase fish losses. In addition, care must be extended during inspection and maintenance activities to ensure any migrating fish that occur in the Project's fish passage systems are salvaged and transported safely, if necessary. It is therefore essential that the Licensee observe proper maintenance practices for the correct, long-term operation of each facility. Thus, the USFWS requires the Licensee to develop and implement an Operations and Maintenance plan for instream flow maintenance, ramping, and fish passage.

7.0 Water Quality

The Licensee shall meet all federal and state water quality standards required by the Clean Water Act in accordance with the water quality certification issued by ODEQ under section § 401 of the Clean Water Act for this license.

Rationale: The Project may have short- and long-term effects to water quality, including water temperature and turbidity. To protect fish and wildlife resources, the Licensee will implement measures to minimize any water quality impacts from the construction and operation of the Project. Oregon's water quality standards are designed to protect the beneficial uses of Oregon's water resources, which include fish and wildlife. Violations of water quality standards can impair fish populations including resident and migratory species. ODEQ's Clean Water Act Section 401 Water Quality Certification will include measures to minimize water quality impacts and address water quality issues that protect fish and wildlife resources.

ODEQ has reviewed the draft Water Quality Management Plan for the Project submitted by GeoSense (for the Applicant) on September 17, 2019, as well as the Heat Source modeling information for the Project, submitted on June 21, 2019. GeoSense has stated that they have not been able to get adequate results from the Heat Source model to develop a relationship between flow in the Project by-pass reach of Rock Creek and the change in water temperature through the by-pass reach (ΔT). The draft Water Quality Management Plan was developed as an alternative to stream temperature modeling, in order for the Project to meet the State of Oregon water quality standards. The amount of warming caused by the Project is limited to a maximum of 0.3° C (ODEQ 2019).

ODEQ has not been able to establish a reasonable method of ensuring compliance with State Water Quality Standards based on the draft Water Quality Management Plan. Specific comments on the draft plan from ODEQ Water Quality Standards Section staff are included in ODEQ 2019. If the plan is included in an application for Section 401 Water Quality Certification, ODEQ will likely have to decide whether to deny the Project a water quality certification or establish conservative minimum flow levels in the by-pass reach during the summer months. Minimum flow values in certification conditions would likely range between 20-25 cubic feet/second during the months of June-September (ODEQ 2019). Thus, the USFWS requires the Licensee to implement the water quality certification conditions issued by ODEQ.

8.0 Terrestrial Wildlife Resources

Within 6 months following License issuance and prior to any ground disturbing construction, the Licensee shall develop a Terrestrial Wildlife Resource Management Plan (TWRMP) to minimize the impacts to wildlife that result from Project construction, operation, and maintenance. The Licensee shall consult with the USFWS, ODFW, and USFS to identify Project activities that will result in permanent loss of terrestrial habitat and locations to mitigate for Project impacts to terrestrial wildlife habitat, such that there is no net loss of terrestrial wildlife habitat. The Licensee, in consultation with and subject to the approval of, the USFWS, ODFW, and USFS shall prepare, and file for Commission approval, the TWRMP. Upon Commission approval, the Licensee shall implement the TWRMP.

The Licensee, per the Revegetation Plan included in Appendix B of the FLA, proposes to remove trees within the Diversion Construction Area and along the Low pressure Pipeline Route. The TWRMP shall identify the timing of tree removal, which shall occur between August 1 and February 29, outside of active nesting periods (March 1 to

July 30), the treatment of decadent trees, snags, and downed logs. The Licensee shall consult with the USFWS, ODFW, and USFS regarding the disposal of trees removed during Project construction.

The TWRMP shall include measures to minimize adverse interactions between Project activities and birds, including Project construction, operation, and maintenance. Power line construction and maintenance shall occur outside the nesting season and all transmission lines shall be constructed to prevent accidental electrocution and provide safe bird perching. All new or rebuilt power poles shall be constructed and maintained in accordance with the Avian Protection Plan Guidelines (APPG 2005), which is intended to be used in conjunction with *Suggested Practices for Raptor Safety on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012). These standards should be applied to all transmission line upgrades.

Rationale: Project-related construction activities will affect terrestrial wildlife and its habitats. As proposed in the FLA, the primary adverse effect on wildlife would be vegetation disturbance, noise, and increased human activity during construction. The FLA states that short-term habitat losses will total 5.35 acres. The transmission line from the powerhouse to existing lines will be 350 feet long. The FLA states that there will be a long-term vegetation loss of 0.07 acres. The removal of approximately 0.75 miles of wooden flume would have short-term noise affects with long-term benefits to wildlife habitat. Project operation and maintenance activities will cause noise impacts to wildlife. However, the FLA does not propose mitigation for affected habitat.

Further, construction activities at the Project site could affect raptor species in the Project area. Noise from construction-related activities, traffic and workers can disturb birds during sensitive periods and cause nest failure. Construction-related disturbances can also negatively impact feeding, foraging, and migratory activities for these birds. The development of a TWRMP, as described in No. 8 (Terrestrial Wildlife Resources) will address these impacts and allow for development of necessary mitigation. The application of strict monitoring, construction timing and adherence to developed guidelines as required by the above recommendation would minimize the Project's impact on raptors and other wildlife species and assure that any negative effects that may occur would be minor or temporary. Thus, the USFWS requires the Licensee to prepare, and file for Commission approval, the TWRMP, in consultation with and subject to the approval by, the USFWS, ODFW, and USFS. Upon Commission approval, the Licensee shall implement the TWRMP.

9.0 Erosion and Sediment Control

Within six (6) months following License issuance and before any ground disturbing construction, the Licensee shall revise the Erosion Control Plan (ECP) described in Appendix B of the FLA to describe the specific rehabilitation techniques and monitoring elements necessary to mitigate all ground disturbing activities during Project construction, operation, and maintenance for the life of the new License. The ECP shall include site-specific erosion control measures that will be implemented at the following locations: the new diversion and intake structure, which will include fish passage and screen facilities and a concrete pipeline intake structure, 11,400 feet of buried pipeline within a previously cleared and graded right-of-way, with elevated pipe sections and associated footings, new powerhouse site, new transmission line and interconnection site. In addition to the measures described in the ECP in Appendix B, the ECP shall include measures A through J below. The Licensee shall consult with the USFWS, USFS, ODFW, and ODEQ on revisions to the ECP and, and upon the approval by the USFWS, USFS, ODFW, and ODEQ, file it for Commission approval. Upon Commission approval, the Licensee shall implement the ECP.

In addition, the Licensee shall:

- A. Follow Forest Service standard best management practices (USDA 2012), in particular, Fac-2 Facility Construction and Stormwater Control, pages 41-42.)
- B. For three (3) years following completion of any Project-related construction or ground disturbance, monitor sediment and erosion control measures for compliance with performance measures described below in (C).
- C. Ensure that the following performance measures are met:
 - a. ground cover in disturbed area equals or exceeds 80 percent of that within an undisturbed control area that has similar vegetation and is adjacent to the Project area;
 - b. species composition in disturbed areas equals or exceeds 75 percent non-weedy species; and
 - c. soil erosion areas shall be reported if rills exceed two (2) inches in depth or six (6) inches in width. If soil erosion is detected, the Licensee shall implement erosion control measures consistent with the ESCP to remedy the erosion.
- D. Grade and revegetate all disturbed soils as soon as possible following the ground disturbance activity with priority given to native species that are locally adapted.
- E. Dewater with pumps all work areas behind temporary cofferdams or isolated work areas below the ordinary high water mark. All pumped water will be

discharged to unsaturated upland vegetated areas for infiltration. Infiltration areas will be monitored daily by a qualified Construction Inspector to ensure that all discharged water is infiltrating and there is no erosion, surface or subsurface runoff occurring. If an area becomes saturated an alternative discharge area will be located.

- F. Properly dispose of all construction debris on land so that the debris cannot enter the waterway or cause quality degradation of state waters. Retention areas, swales or impoundments will be used to prevent discharge of water from construction staging areas.
- G. If re-vegetation requirements are not met within three (3) years post construction, consult with the USFWS, USFS, ODFW, and ODEQ, to identify and implement measures including, but not limited to reseeded, additional mulch, soil amendments, and supplemental irrigation to ensure establishment of vegetation where required.
- H. Identify measures to be taken to ensure that any Project-related construction will not increase turbidity and sediment discharge into Rock Creek, including during construction of the diversion structure, downstream and upstream passage facilities, powerhouse and tailrace. The Licensee shall identify measures to be employed to mitigate any increased turbidity or sediment due to Project-related construction.
- I. For any Project-related construction that requires removal and/or fill actions in waters of the state (i.e. any construction below the ordinary high-water mark or in wetlands), obtain, as applicable, a removal-fill permit from ODSL, a dredge and fill permit from the US Army Corps of Engineers pursuant to Clean Water Act (CWA) § 404 and a CWA §401 water quality certification from ODEQ. The in-water work period in Rock Creek is from July 1 through October 31, or as allowed by a variance as approved by ODSL in consultation with ODFW.
- J. In the event of future construction activities associated with the Project, consult with the USFWS, ODFW, USFS, and ODEQ 90 days before commencing any Project-related land-clearing, land disturbing, or spoil-producing activities, and incorporate the agency recommendations into a comprehensive plan to control erosion, dust, and slope stability and to minimize the quantity of sediment or other potential water pollutants resulting from Project construction, spoil disposal, and Project operation and maintenance.

Rationale: Ground-disturbing activities during maintenance or construction of new facilities could increase turbidity and sedimentation levels in Rock Creek and cause direct and indirect impacts to riparian and aquatic habitats. Suspended sediment may

interfere with the biological functions of fish and other aquatic organisms by inhibiting respiration and feeding. The Erosion and Sediment Control Plan (ESCP) will ensure that proper measures are in place to reduce erosion and limit sediment from entering waterways in the Project area and protect water quality, fish and fish habitats.

The ESCP will also help prevent surface contaminants from entering Rock Creek due to ground disturbing activities, while helping to reduce soil erosion, slope instability issues, dust contamination, and degradation of water quality. The design and implementation of an effective ESCP, utilizing current Best Management Practices, would ensure that these impacts to water quality and natural resources are minimized. Thus, the USFWS requires the Licensee to update and implement the Erosion and Sediment Control Plan (refer to above), including consultation and final approval by the USFWS, USFS, ODFW, and ODEQ.

10.0 Revegetation and Noxious Weed Management Plan (RNWMP)

Within six months following License issuance and prior to any land disturbing activities, the Licensee shall revise the Revegetation Plan included in Appendix B of the FLA, to include measures A through E below. The revised Revegetation Plan shall describe the Licensee's obligations to reduce construction and operational impacts to native vegetation within the Project area and on adjacent lands, restore native vegetation on any sites impacted by Project activities, and monitor and maintain the Project area for the term of the license to ensure that non-native plants are not introduced. In addition to the measures proposed in the Revegetation Plan, the Revegetation Plan shall specify weed prevention and treatment strategies that will be employed on all ground disturbed by Project activities. The Licensee shall consult with the following stakeholders for their review and approval of the revised Revegetation Plan: USFS, the USFWS, ODFW, and ODEQ. Upon these agencies' approval, the Licensee shall file the revised Revegetation Plan with the Commission. After Commission approval, the Licensee shall implement the Revegetation Plan. In addition, the Licensee shall:

- A. Be responsible for implementing appropriate BMPs to prevent the establishment or spread of invasive non-native plants in the Project area from Project-related activities.
- B. Implement a cleaning program for equipment and vehicles that involves power spraying with water to remove seeds, plant material, soil or mud.
- C. Inspect all equipment, including that used by subcontractors, to ensure that it is clean before allowed on Project job sites. In general, this program shall apply to the following:

- a. Nets, fish traps, and other field gear (waders, hip boots, buckets, etc.) used in waters outside of Rock Creek;
 - b. Equipment used off of paved or gravel roads that arrive from locations outside the general vicinity; and
 - c. Vehicles that were used on paved or gravel roads where known infestations of noxious weeds occur.
- D. Limit construction and maintenance activities to sites that are as small and as contained as possible to accomplish the activity at hand. To the extent possible, these sites will be placed in areas that have been disturbed previously, or where the existing weeds have been treated.
- E. Ensure materials used on Forest Service sites are inspected by a District or Forest weed specialist and judged to be weed free before use (USDA Forest Service Preventing and Managing Invasive Plants Record of Decision Standard 7). Sand, gravel, and other fill or borrow material used for construction activities generally contains seeds, roots, and other plant parts. This material can introduce new invaders and/or common invasive non- native plants that can quickly colonize disturbed sites. If weeds are found, material may be taken from a fresh face, or the contaminated layer excavated and set aside, and/or infested sources may be treated.
- F. Implement noxious weed control measures and/or coordinate noxious weed control with appropriate resource agencies including, but not limited to the USFWS, ODFW, and USFS, to ensure that all disturbed areas affected by Project activities are appropriately treated for noxious weeds.
- G. Monitor noxious weed control and re-vegetation efforts for three (3) years post construction, two (2) times per year (spring and fall), and every third (3rd) year thereafter on all lands within the Project boundary and buffers areas described in FLA Appendix B, including USFS Road #5520, the diversion dam site and associated fish passage facilities, the 11,400-foot pipeline corridor, the new powerhouse site, and the 500-foot transmission line corridor and interconnect site.
- H. Replant all soil disturbed during Project construction using an approved seed mix or native plants approved by the USFS, USFWS, and ODFW. The Licensee shall ensure that (a) ground cover in disturbed areas equals or exceeds 80 percent of that in an undisturbed control area with similar vegetation and is adjacent to the Project area; and (b) species composition in disturbed areas equals or exceeds 75 percent non-weedy species.
- I. If re-vegetation requirements are not met within three (3) years post construction, consult with the USFS, USFWS, and ODFW to identify and

implement measures including, but not limited to reseeded, additional mulch, soil amendments and supplemental irrigation to ensure establishment of vegetation where required.

Rationale: Disturbances associated with the development, operation, and maintenance of the Project will impact terrestrial habitat and result in the removal of native vegetation, increasing the potential for introduction of non-native vegetation and impacts to those wildlife species that depend on the native vegetation. The RNWMP shall identify specific actions that the Licensee is to undertake for the life of the license to ensure noxious and/or invasive plants are not introduced to the Project site and native plant communities are restored, maintained, and enhanced. Similarly, the periodic monitoring for noxious and invasive plants would ensure prompt and appropriate actions for control or eradication of noxious or invasive plant species and ensure Project impacts to native plant communities from any noxious or invasive plants would be minimized.

Thus, the USFWS requires the Licensee to update and implement the Revegetation and Noxious Weed Management Plan (RNWMP), including consultation and final approval by the USFS, USFWS, ODFW, and ODEQ.

11.0 Spring Connectivity and Wetland Impact

Within the TWRMP, the Licensee shall develop a strategy and schedule to mitigate for any permanent loss of terrestrial habitat, including springs and wetlands. The Licensee shall consult with the USFWS, ODFW, and USFS to identify locations to mitigate for the permanent loss of terrestrial, and spring connectivity to Rock Creek, and wetland habitat associated with construction of the Project including the Pipeline resulting in no net loss of wetland habitat. All mitigation actions require approval by the USFWS, ODFW, and USFS. Upon Commission approval of the TWRMP, the Licensee shall implement the plan, including any mitigation needed for impacts to spring connectivity and wetlands.

Rationale: The Applicant states that a seasonal spring located where the pipeline crosses a topographic draw (about 2,500 feet from Rock Creek) would be spanned with an overhead pipe. Pipe supports would be placed outside the seep area. A similar configuration would be used at the smaller topographic draw located about 1,700 feet from Rock Creek, allowing undisturbed flow of water during spring runoff. With this pipeline design, no wetlands areas would be disturbed. Adjacent upland areas would be recovered under RNWMP measures. If this proposed activity does not occur as

proposed, and/or if additional springs and wetland habitat are located in the Project area and cannot be protected, the ecological value of the habitat will be reduced. This type of permanent impact requires mitigation by the Licensee in accordance with ODFW's Fish and Wildlife Mitigation Policy (OAR 635-415-0000 through 0025).

Mitigation areas should be selected for in-kind replacement of lost wetland habitat features and in the general proximity of Project impacts and will require close coordination with ODFW and other resource agencies.

Thus, the USFWS requires the Licensee to consult with the USFWS, ODFW, and USFS to identify locations to mitigate for the permanent loss of terrestrial habitats, spring connectivity to Rock Creek, and wetland habitats associated with construction of the Project, including the Pipeline and resulting in no net loss of wetland habitat.

12.0 Bull Trout Presence in Rock Creek

If bull trout presence is documented in Rock Creek during the Project License term, the USFWS reserves its ability to require additional measures to protect bull trout from Project activities (passage, flows, ramping, and other activities).

Rationale: The bull trout is federally listed as threatened. If bull trout are present in the watershed, including additional measures for the Project will help minimize Project impacts to this listed fish species. Thus, the USFWS reserves its ability to require additional measures to protect bull trout from Project activities (passage, flows, ramping, and other activities) if bull trout presence is documented in Rock Creek during the Project License term.

13.0 Downstream and Upstream Fish Passage Facilities

13.1 Construction and Operation of Downstream Fish Passage Facilities.

The Licensee shall design, construct, evaluate, operate, and maintain downstream fish passage facilities (downstream facilities) at the diversion dam proposed in the FLA to provide for the safe, timely, and effective downstream passage of native fish species, primarily redband trout. The downstream facilities shall include a fish screen, as proposed on page 8 and Exhibit F-4 and F-5 of the FLA, which shall be designed in accordance with an *Anadromous Salmonid Passage Facility Design*, developed by the National Marine Fisheries Service (NMFS, 2011) to prevent injury and mortality to fish caused by entrainment into the Project penstock and passage through the turbine.

Specifically, the fish screen shall adhere to, but is not limited to, the following criteria unless alternative criteria are approved by ODFW, the USFWS, and USFS: (a) the screen area must be large enough to pass flow at velocities less than 0.4 feet per second approach velocity; (b) the screen material must be corrosion resistant and durable enough to maintain a smooth uniform surface; (c) maximum opening size is 3/32-inch for circular or square mesh screen materials such as perforated plate or wire mesh and 1/16-inch slot width for wedge wire (slotted) screens; and (c) the screen must be self-cleaning. The downstream facilities shall also include a safe and effective means to return fish to Rock Creek below the Project diversion structure. The downstream facilities shall provide for the uninterrupted passage of fish over the full range of flows for which the Project operates.

Construction shall be complete, and the fish facilities fully operational, before the Licensee initiates the diversion of flow for Project operation. The Licensee shall conduct and complete a hydraulic evaluation of the downstream fish passage facilities and ensure the facility operates within allowable hydraulic criteria prior to continuous Project operation, and maintain the facility to ensure optimal performance over the license term.

Rationale: Fishway designs that meet NMFS 2011 fish screen and downstream passage criteria have been demonstrated to be adequate for the safe and timely passage of native fish. Redband trout are a native resident fish that migrate within their spawning and rearing habitats which are located both up- and downstream of the Project area. Providing safe, timely and effective downstream fish passage at the Project would minimize the potential for delay, injury, and mortality of redband trout (all life stages), and other native species under a new license, and allow completion of life histories without harming current timing and use of habitats up and downstream of the Project. The new fishway structures will require ODFW and USFWS approved downstream passage for redband trout and other native fish species to minimize delay, injury, and mortality of juvenile and adult redband trout and other native species from passage at the fishway structures to their natal downstream habitat in the bypass reach and further downstream. Thus, the USFWS requires the Licensee to provide fish passage at its Project.

13.2 Construction and Operation of Upstream Fish Passage.

The Licensee shall design, construct, evaluate, operate, and maintain upstream fish passage facilities at the diversion dam proposed in the FLA to provide for the safe, timely, and effective upstream passage of native fish species, primarily redband trout. The upstream fish passage structure proposed on page 8 and F-4 and F-6 of the FLA

shall meet criteria established by ODFW in OAR 635-412-0035, including, but not limited to:

- A. Year-round passage across the range of flows experienced at the site for all species and life stages of native migratory fish present;
- B. Jump heights shall not exceed 6 inches between upstream and downstream surface elevation;
- C. Water depth through the fishway shall be at least 6 inches;
- D. All fishway locations through which fish must swim shall be at least 12 inches wide;
- E. Velocities within transport channels shall range from 1-2 feet per second (fps); and
- F. Fishway entrance must have adequate attraction flow, but shall not exceed 8 fps; nor shall velocity in transitions between fishway pools exceed 8 fps.

Construction of upstream fish passage facilities shall be completed and fully operational prior to operation of the Project. The Licensee shall conduct and complete a hydraulic evaluation of the upstream fish passage facility and ensure the facility operates within allowable hydraulic criteria prior to Project operation, and maintain the facility to ensure optimal over the license term.

Rationale: Fishway designs for upstream fish passage that meet ODFW in OAR 635-412-0035 passage criteria have been demonstrated to be adequate for the safe and timely passage of native fish. These measures are necessary to ensure that prescribed upstream fish passage facilities are fully functional, meet all fishway design criteria, and achieve the USFWS, ODFW, and the USFS's goals for the effective upstream passage of native fish.

Redband trout are a native resident fish that migrate within their spawning and rearing habitats which are located both up- and downstream of the Project area. Providing safe, timely and effective upstream fish passage at the Project would minimize the potential for delay, injury, and mortality of redband trout (all life stages), and other native species under a new license, and allow completion of life histories without harming current timing and use of habitats up- and downstream of the Project. The new fishway structures will require ODFW and USFWS approved upstream passage for redband trout and other native fish species to minimize delay, injury, and mortality of juvenile and adult redband trout and other native species requiring upstream passage to their native spawning and rearing habitat. Thus, the USFWS requires the Licensee to provide fish passage at its Project.

13.3 Downstream and Upstream Passage Facility Design Review.

The Licensee shall conduct fish passage alternative meetings with the USFWS, ODFW, and the USFS prior to sharing preliminary designs. The Licensee shall submit all downstream and upstream fish passage facility preliminary design plans and specifications, and final design plans and specifications to USFWS, ODFW, and USFS for review. The Licensee shall complete the following design steps prior to the construction of both downstream and upstream facilities:

- A. Early involvement by the Licensee and the USFWS, ODFW, and USFS on fish passage alternative selection and development for the Project;
- B. Preliminary Design Selection: After design has progressed to the 30 percent design stage, the Licensee shall consult with the USFWS, ODFW, and USFS before proceeding to more detailed design. If modeling is not required to make the design selection, the Licensee shall conduct any necessary modeling and the progression to the 30 percent design stage concurrently;
- C. Design Consultation and Review: After any necessary modeling is complete, and the design has progressed to 60 percent, the Licensee shall consult with the USFWS, ODFW, and USFS prior to proceeding with further design; and
- D. Final Consultation: After consultation is complete, the Licensee will progress the design to 90 percent, and then to final status. The Licensee shall, upon approval by the USFWS, ODFW, and USFS, file the final design with the Commission for approval. Upon Commission approval, the Licensee shall implement the design.

Rationale: These measures are necessary to ensure that prescribed downstream and upstream fish passage facilities are fully functional, meet all fishway design criteria, and achieve the USFWS, ODFW, and the USFS's goals for the safe, timely and effective passage of native fish. The USFWS, ODFW, and USFS have considerable expertise, experience, authorities, and responsibilities associated with fishway system design, evaluations, maintenance, and operations. To ensure these expert entities are afforded opportunity to participate in fishway activities, a design review procedure will be instituted for any fish passage plans proposed by the Licensee or its agent(s). The USFWS and other stakeholder staff (such as engineers, biologists, and other fish passage specialists) will help ensure quality and performance of complex hydraulic biological systems associated with the fish passage prescriptions. Thus, as the Licensee

or its agent(s) develop fish passage plans, the USFWS requires the Licensee to consult with the USFWS, ODFW, USFS, and ODEQ and obtain USFWS and ODFW approval on fish passage plans.

13.4 Written Operation and Maintenance Procedures.

The Licensee shall maintain the of downstream and upstream fish passage facilities in optimal operating condition and free from debris, obstructions and damage at all times. The Licensee shall develop written operation and maintenance procedures (including operator training and supervision) that includes routine maintenance inspections and implementation of timely repairs and ensures that the fish passage facilities operate effectively during the life of the Project. The operation and maintenance plan shall include procedures for notification and coordination with the USFWS, ODFW, and USFS on maintenance scheduling or emergencies that affect functioning of the facilities. Operation and maintenance procedures for the diversion structure and upstream and downstream passage facilities shall be included in the Operation and Maintenance Plan identified in Term and Condition 4.

Rationale: Fish passage systems are subject to continuous operations and harsh riverine and climatic conditions. Because vital fish migrations will occur on a regular basis at the Project's fishway facilities, proper maintenance of the fish passage systems is necessary to ensure the movement of fish in completing their biological requirements, including spawning, rearing and migration (NMFS 2011). Effective operation and performance of the Project's fish passage systems are dependent on regular inspection and maintenance to assure proper operating conditions within each fish passage feature. Wear and tear, corrosion, accumulation of sediment and debris, and various other factors decrease the effectiveness of the fishway's physical features. If left untreated, these factors would increase fish losses. In addition, care must be extended during inspection and maintenance activities to ensure any migrating fish that occur in the Project's fish passage systems are salvaged and transported safely, if necessary. It is therefore essential that the Licensee observe proper maintenance practices for the correct, long- term operation of each facility. Thus, the USFWS requires the Licensee to develop and implement an Operations and Maintenance plan for fish passage facilities associated with the Project.

14.0 Post-Construction Evaluation and Monitoring Plan

Prior to completion of the fish facilities, the Licensee, in consultation with ODFW, the USFWS and USFS, shall prepare a post-construction hydraulic evaluation plan, monitoring plan, and implementation schedule for all fish passage facilities. The written

plan shall be submitted to ODFW, USFWS and USFS for approval, and then filed with the Commission. Upon Commission approval, the Licensee shall implement the plan. The plan shall include a short- term hydraulic evaluation to ensure that the performance of the facilities is consistent with the design criteria.

If the results of the hydraulic evaluation indicate that performance criteria are not met, then the Licensee shall consult with the USFWS, ODFW, and USFS to develop recommendations to bring the facilities into compliance with applicable agency criteria as quickly as possible but no later than 30 days after acquiring information indicating non-compliance, including a schedule for implementing the measures. The recommended measures and implementation schedule shall be filed with the Commission after approval by the USFWS, ODFW, and USFS. Measures to bring the screens into compliance with the standards may include, but are not limited to, improved hydraulic balancing of screens or structural modifications, seasonal Project shutdown, and/or reduction in flow diversion. Any measures to bring the screens into compliance may be required for the remaining term of the license or may be required temporarily until alternative measures are implemented to achieve the design performance.

Rationale: Adjustments are often required with new or modified facilities to achieve optimal fish passage conditions. For instance, operational or structural adjustments may be needed within the new fishway to achieve effective attraction flows at the entrance. For each newly- constructed fish passage facility, the Licensee must develop and implement hydraulic evaluation plans to determine fishway system effectiveness and to identify and correct any fish delay, loss, injury, or hydraulic problems that may be present. Results of these evaluations will identify if and where such adjustments are necessary. Thus, to ensure newly-constructed fishway facilities achieve optimal fish passage conditions, the USFWS requires the Licensee to develop and implement hydraulic monitoring plans for fish passage at Project facilities.

15.0 Inspection

The Licensee shall grant reasonable access to Project developments and records so that the USFWS and other stakeholder personnel (ODFW, USFS, ODEQ, OWRD, and CTUIR) will be able to inspect fishway facilities and evaluate fishway performance, inspect any habitat enhancements and evaluate habitat restoration success, and inspect and evaluate Project operations required by this license.

Rationale: This access for evaluations and inspections will allow the USFWS and other stakeholders to help optimize facility performance. Thus, the USFWS requires the Licensee to grant the USFWS, ODFW, USFS, ODEQ, OWRD, and CTUIR (stakeholders) reasonable access to Project developments and records.

16.0 Reservation of Authority

The USFWS reserves the right and opportunity to amend, modify, or add to these terms and conditions if resource conditions change, Project plans are altered, or new information is developed, as appropriate to prevent loss of, or damage to fish and wildlife resources.

Rationale: This reservation of authority allows the USFWS to consider additional data as it becomes available; to respond to changed circumstances; and to modify the existing terms and conditions as may be necessary to protect fish and wildlife resources affected by the Project.

17.0 Bull Trout Documentation in the Project Area

The Licensee shall document bull trout observed or collected in the Project area. The documentation shall include: 1) the number of bull trout observed or collected; 2) their estimated size (length); 3) geographic location (GPS if available); 4) if the bull trout were alive or dead; 6) date of the observation or collection; and 5) the name of person that observed or collected the fish. The Licensee shall provide this information in a timely manner (within seven business days) to the USFWS, ODFW, and the USFS. The license shall provide an annual summary of total bull trout documented in Rock Creek for the year (including 1-5 above) in an annual report to USFWS, USFS, ODFW, ODEQ, OWRD, and CTUIR, due by February 15, at least 30 days prior to the annual stakeholder consultation meeting (refer to Term and Condition 1 – Consultation with the USFWS).

Rationale: The bull trout is federally listed as threatened. To date, one possible bull trout/brook trout hybrid documented in 1994 is the only documentation of potential bull trout presence in Rock Creek. Additional data collection on bull trout presence/absence is needed for this watershed. If bull trout are observed or collected in the Project area, this is important information to collect and report to the USFWS, ODFW, and the USFS. Such information is crucial to USFWS in carrying out its obligations under Section 30(c). Thus, the USFWS

requires the Licensee to document bull trout observed or collected in the Project area, during the Project License, as described above.

18.0 Stream Crossing Prior Approval

Within six (6) months following License issuance and before any ground disturbing construction, the Licensee shall consult with the USFWS, USFS, ODFW, and DEQ for prior approval of locations and designs for construction of temporary stream crossings to be used during Project construction activities, including, but not limited to, pipeline construction.

Rationale: Rock Creek provides cold and clean water habitat for redband and possibly the bull trout, including spawning and rearing habitat for redband trout. Consultation and prior approval of the locations and construction of temporary stream crossings for Project activities with the above agencies will help minimize impacts to Rock Creek native fish populations, habitat, and limit impacts to water quality (sediment/turbidity, and chemical contamination).

Thus, the USFWS requires the Licensee to consult with the USFWS, USFS, ODFW, and DEQ for prior approval of locations and designs for construction of temporary stream crossings.

CONCLUSION

The USFWS expects the Project, if it adheres to the conditions as submitted here, to continue to provide good quality and quantity of fish habitat for redband and bull trout over the license period. The Department does not object to the issuance of a new license for the Project, provided that the USFWS's terms and conditions (and reservation of authority to modify these conditions) pursuant to Section 30(c) of the FPA are incorporated into the new license. The Department believes that the 30(c) conditions submitted by USFWS, if placed in the license in their entirety, will be adequate to address our resource concerns, but since the Commission's Notice called for preliminary prescriptions, the Department is also reserving its authority to impose fishway prescriptions under Section 18 of the FPA. We encourage the Commission and the Applicant to continue consultation and coordination with USFWS staff regarding means and measures to ameliorate the Project's effects on fish and wildlife and other environmental values.

If there are any questions regarding these comments or if the Commission determines that any of the fish and wildlife terms and conditions herein are inconsistent with the purposes and requirements of the FPA, as amended by the Electric Consumers Protection Act, then Ms. Marisa Meyer, Field Supervisor, U.S. Fish and Wildlife Service, La Grande Field Office, 3502 Highway 30, La Grande, OR, 97850 (541-962-8509), should be contacted to resolve the inconsistencies prior to issuance of the license.

**APPENDIX D – OREGON DEPARTMENT OF FISH AND WILDLIFE SERVICE
PRELIMINARY 30(C) MANDATORY CONDITIONS**

Date filed: November 12, 2019

**Rock Creek Project
FERC Project No. 12726**

Applicant intends to seek benefits under § 210 of the Public Utility Regulatory Policy Act of 1978 (PURPA), therefore ODFW (along with NMFS and USFWS) have mandatory conditioning authority under the procedures provided for at § 30(c) of the FPA. A license for a qualifying small hydroelectric power project with PURPA benefits requires inclusion of all terms and conditions that are prescribed by state and Federal fish and wildlife agencies to prevent loss of, or damage to, fish and wildlife resources, and to otherwise carry out the purposes of the Fish and Wildlife Coordination Act, pursuant to 18 CFR 4.106(b). Consistent with our responsibilities, we have determined that the following terms and conditions are necessary to protect, mitigate losses to and enhance fish and wildlife resources.

The following fish and wildlife conditions were developed to support ODFW's previously described resource management policies, goals and objectives. ODFW's priorities are to ensure that naturally reproducing and self-sustaining populations of redband trout and other native fishes in the Rock Creek basin are supported and maintained; to eliminate or reduce adverse impact to water quality; and to mitigate for the unavoidable losses of fish and wildlife habitat due to Project construction, operation, and

maintenance. Accordingly, pursuant to Section 30 (c) of the FPA (16 U.S.C. 791 *et seq.*) and to carry out the purposes of the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*), ODFW provides the following terms and conditions to be included in the new license.

The following conditions are based on current information available regarding the license proposal for the Rock Creek Hydroelectric Project. As more detailed plans are developed and Project operations begin under the new license, deficiencies may be observed and modifications to fish and wildlife protection and mitigation measures may be necessary. Modifications may also be necessary to finalize design plans or correct deficiencies or problems found during post- license monitoring and evaluations. Therefore, ODFW reserves the right to amend these Section 30(c) conditions as needed to be consistent with finalized design plans, new information developed as a result of the Commission's environmental review process, or to correct deficiencies or problems found during post-licensing monitoring or evaluations. ODFW respectfully requests that the Commission acknowledge such reservation in any license issued for the Rock Creek Hydroelectric Project.

30(c) Condition 1: Consultation with the Oregon Department of Fish and Wildlife

The Licensee shall, for the conservation and development of fish and wildlife resources, consult directly with the Oregon Department of Fish and Wildlife (ODFW), U.S. Fish and Wildlife Service (USFWS), USDA Forest Service (USFS), Oregon Department of Environmental Quality (ODEQ), and Oregon Water Resources Department (OWRD)

(“agencies” or “stakeholders”) regarding the completion of Project plans and designs for measures to protect, mitigate damages to, and enhance fish and wildlife resources.

The Licensee shall hold an Annual Resource Coordination meeting on or before March 15. At least 30 days in advance of the meeting the Licensee shall coordinate with the agencies and other interested entities to schedule and plan the meeting.

The Licensee shall make the following information available to meeting participants at least 30 days prior to the meeting:

- a) An operations plan for the year in which the meeting occurs, including planned outages and a description of planned maintenance projects.
- b) Any records of non-compliance with the License for the previous year.
- c) The hydrology record for the previous year.
- d) Results of any monitoring conducted the previous year.
- e) A written status report detailing compliance with the Project License Conditions. The report shall include a summary of each of the ODFW’s 30(c) conditions and a statement indicating how the Licensees met the condition during the previous year.
- f) List of License Conditions that require action in the year in which the meeting occurs.
- g) Reporting of bull trout observed or collected in the Project area as described in Condition 14).

The Annual Coordination Meeting agenda shall include, but not be limited to:

- a) Discussion of the documents provided to ODFW and other stakeholders prior to the meeting.
- b) Review of any non-routine maintenance that occurred in the prior year or planned for the forthcoming year.
- c) Discussion of any foreseeable changes to Project facilities or features.
- d) Discussion of any necessary revisions or modifications to implementation plans approved as part of this license.
- e) Discussion of needed protection measures for species newly listed as threatened, endangered, or sensitive, or changes to existing management plans that may no longer be warranted due to delisting of species or, to incorporate new knowledge about a species requiring protection.
- f) Discussion of any climate change effects on Project operations, and implications for fish and wildlife resources in the project vicinity.
- g) Discussion of any planned pesticide or herbicide use.

A record of the meeting shall be kept by Licensee and, after review by the agencies, shall file the meeting record, if requested, with the Commission no later than 60 days following the meeting.

Justification: Detailed plans and designs remain to be finalized for some of the Project's proposed facilities, operations and maintenance activities. Accordingly, post-licensing discussion with ODFW and other affected resource agencies will be required. Therefore, any new license issued by the Commission should include a general requirement for the Licensee to consult with ODFW, USFWS, USFS, ODEQ, and OWRD regarding the completion of proposed and future plans and designs for measures to protect, mitigate damages to, and enhance fish and wildlife resources.

The USFWS, USFS, ODFW, ODEQ, and OWRD have considerable expertise, experience, authorities, and responsibilities associated with natural resource management, and fishway system design, evaluations, maintenance, and operations. To ensure these expert entities are afforded opportunity to participate in development of project plans, schedules and designs, a design review procedure will be instituted for any plans proposed by the Licensee or its agent(s) that affect fish and wildlife resources and their habitats. Thus, as the Licensee or its agent(s) develop Project plans, schedules, designs, ODFW requires the Licensee to consult with it and other stakeholders on Project plans affecting fish and wildlife resources.

The information provided by the Licensee to the agency stakeholders prior to each Annual Resource Coordination meeting shall include details relating to the Licensee's implementation of each resource management plan and describe the Licensee's current year's progress as well as proposed plans for the upcoming year. Consistent and regularly scheduled reporting allows the agencies to stay abreast of the progress in implementing the License, and ensure adequate and timely coordination between the Licensee and ODFW, allowing the ODFW to determine if required actions are implemented in a timely and successful manner, and evaluate whether the Licensee is adequately planning for timely implementation of future license requirements. While there is no specified deadline for the annual report to be completed, the ODFW expects such reporting would occur prior to February 15 of each year to allow for timely discussion of the previous year's actions and upcoming actions in the subsequent year (30 days prior to March 15 meeting). Each Annual Report would summarize the activities completed to date and the Project's future activities, including coordination, reviews, and approvals by the Parties and the Commission. Finally, each Annual Report would provide a tracking device to compare license articles and actual accomplishments.

30(c) Condition 2: Downstream and Upstream Fish Passage Facilities

2.1 Construction and Operation of Downstream Fish Passage Facilities. The licensee shall design, construct, evaluate, operate and maintain downstream fish passage facilities (downstream facilities) at the diversion dam proposed in FLA to

provide for the safe, timely, and effective downstream passage of native fish species, primarily redband trout. The downstream facilities shall include a fish screen, as proposed on page 8 and Exhibit F-4 and F-5 of the FLA, which shall be designed in accordance with National Marine Fisheries Service (NMFS, 2011) to prevent entrainment of fish into the Project penstock and passage through the turbine. The downstream facilities shall also include a safe and effective means to return fish to Rock Creek below the Project diversion structure and provide for the uninterrupted passage of fish over the full range of flows for which the Project operates. The fish screen shall adhere to NMFS (2011) criteria unless alternative criteria are approved by ODFW, USFWS and USFS.

Construction shall be completed, and the fish facilities fully operational, before the licensee initiates the diversion of flow for Project operation. The Licensee shall conduct and complete a hydraulic evaluation of the downstream fish passage facilities and ensure the facility operates within allowable hydraulic criteria prior to continuous Project operation, and maintain the facility to ensure optimal performance over the license term.

Justification:

Fish residing in water bodies above artificial obstructions can be entrained in the water withdrawn for power generation and experience increased injury or mortality from passage through hydroelectric turbines. Turbine passage can be prevented by the installation of fish screens. Downstream passage facility designs that meet NMFS (2011) fish screen and downstream passage criteria have been demonstrated to be adequate for the safe and timely passage of native fish.

This condition will ensure that ODFW can meet its responsibility to prevent loss of, or damage to, fish and wildlife resources and to otherwise carry out the purposes of the Fish and Wildlife Coordination Act. To that end, screens must have sufficiently small mesh sizes to prevent entrainment of juvenile fish and sufficiently low approach

velocities to prevent impingement of fish against the screen. Screens must effectively exclude fish under a variety of streamflows, bedloads, and debris loads. Additionally, screen design must include a cleaning mechanism that operates frequently enough to prevent clogging or restriction of flow. Screening standards for salmonids are based on survival rates known to be attainable with existing technologies designed to current agency fish screen criteria. Redband trout are a native resident fish that migrate within their spawning and rearing habitats which are located both up- and downstream of the project area. Providing safe, timely and effective downstream fish passage at the Project would minimize the potential for delay, injury, and mortality of redband trout (all life stages), and other native species under a new license, and allow completion of life histories without harming current timing and use of habitats up and downstream of the Project. The proposed diversion and screening structures will require ODFW and USFWS approved downstream passage for redband trout and other native fish species to minimize delay, injury, and mortality of juvenile and adult redband trout and other native species from passage at the fishway structures to their natal downstream habitat in the bypass reach and further downstream.

2.2 Construction and Operation of Upstream Fish Passage. The licensee shall design, construct, evaluate, operate and maintain upstream fish passage facilities at the diversion dam proposed in the FLA to provide for the safe, timely, and effective upstream passage of native fish species, primarily redband trout. The Licensee shall develop a Fish Passage Plan for the upstream fish passage structure proposed on page 8 and F-4 and F-6 of the FLA shall meet criteria established by ODFW in OAR 635-412-0035, including, but not limited to:

- a) Year-round passage across the range of flows experienced at the site for all species and life stages of native migratory fish present;
- b) Jump heights shall not exceed 6 inches between upstream and

- downstream surface elevation;
- c) Water depth through the fishway shall be at least 6 inches;
 - d) All fishway locations through which fish must swim shall be at least 12 inches wide;
 - e) Velocities within transport channels shall range from 1-2 feet per second (fps); and
 - f) Fishway entrance must have adequate attraction flow, but shall not exceed 8 fps; nor shall velocity in transitions between fishway pools exceed 8 fps.

Construction of upstream fish passage facilities shall be completed and fully operational prior to operation of the Project. The licensee shall conduct and complete a hydraulic evaluation of the upstream fish passage facility and ensure the facility operates within allowable hydraulic criteria prior to Project operation, and maintain the facility to ensure optimal operation over the license term.

Justification:

Design of upstream fish passage facilities that meet ODFW passage criteria in OAR 635-412- 0035 (ODFW 2016a) have been demonstrated to provide for the safe, timely and effective passage of native fish. These measures are necessary to ensure that prescribed upstream fish passage facilities are fully functional, meet all fish passage design criteria, and achieve the USFWS, ODFW, and the USFS's goals for the effective upstream passage of native fish.

Redband trout are a native resident fish that migrate within their spawning and rearing habitats which are located both up- and downstream of the project area. Providing safe, timely and effective upstream fish passage at the Project would minimize the potential for delay, injury, and mortality of redband trout (all life stages), and other native species under a new license, and allow completion of life histories without harming

current timing and use of habitats up- and downstream of the Project. The new fish passage structures will require ODFW and USFWS approved upstream passage for redband trout and other native fish species to minimize delay, injury, and mortality of juvenile and adult redband trout and other native species requiring upstream passage to their native spawning and rearing habitat

2.3 Downstream and Upstream Passage Facility Design Review. The Licensee shall submit all downstream and upstream fish passage facility preliminary design plans and specifications, and final design plans and specifications to ODFW, USFWS, and USDA Forest Service for review. The Licensee shall complete the following design steps prior to the construction of both downstream and upstream facilities:

- a) Preliminary Design Selection: After design has progressed to the 30% design stage, the Licensee shall consult with ODFW, USFWS, and USDA Forest Service before proceeding to more detailed design. If modeling is not required to make the design selection, the Licensee will conduct any necessary modeling and the progression to the 30% design stage concurrently;
- b) Design Consultation and Review: After any necessary modeling is complete, and the design has progressed to 60%, the Licensee will consult with ODFW, USFWS, and USDA Forest Service prior to proceeding with further design; and
- c) Final Consultation: After consultation is complete, the Licensee will progress the design to 90%, and then to final status. The Licensee shall, upon approval by ODFW, USFWS, and USFS, file the final design with the Commission for approval. Upon Commission approval, the Licensee shall implement the design.

Justification:

These measures are necessary to ensure that prescribed downstream and upstream fish passage facilities are fully functional, meet all fish passage design criteria, and

achieve the USFWS, ODFW, and the USFS's goals for the safe, timely and effective passage of native fish.

The USFWS, ODFW, and USFS have considerable expertise, experience, authorities, and responsibilities associated with fish passage design, evaluations, maintenance, and operations. To ensure these expert entities are afforded opportunity to participate in fish passage design development, a design review procedure must be instituted for any fish passage plans proposed

by the Licensee or its agent(s). ODFW and other Stakeholder staff (such as engineers, biologists, and other fish passage specialists) will help ensure quality and performance of complex hydraulic biological systems associated with the fish passage prescriptions.

2.4 Written Operation and Maintenance Procedures. The Licensee shall maintain the downstream and upstream fish passage facilities in optimal operating condition and free from debris, obstructions and damage at all times. The Licensee shall develop written operation and maintenance procedures (including operator training and supervision) that includes routine maintenance inspections and implementation of timely repairs and ensures that the fish passage facilities operate effectively during the life of the project. The operation and maintenance plan shall include procedures for notification and coordination with ODFW, USFWS and USDA Forest Service on maintenance scheduling or emergencies that affect functioning of the facilities. Operation and maintenance procedures for the diversion structure and upstream and downstream passage facilities shall be included in the Operation and Maintenance Plan identified in Condition 4.

Justification:

Fish passage facilities are subject to continuous operations and harsh riverine and climatic conditions. Because fish migrations will occur on a regular basis through the

Project bypass reach and past the Project diversion, proper maintenance of the fish passage facilities is necessary to ensure the movement of fish in completing their biological requirements, including spawning, rearing and migration (NMFS 2011). Effective operation and performance of the Project's fish passage facilities are dependent on regular inspection and maintenance to assure proper operating conditions within each fish passage feature. Wear and tear, corrosion, accumulation of sediment and debris, and various other factors decrease the effectiveness of the fish passage features. If left untreated, these factors would increase fish losses. In addition, care must be extended during inspection and maintenance activities to ensure any stranded fish observed within in the Project's fish passage facilities are salvaged and transported safely, and in a timely manner, to Rock Creek, if necessary. It is therefore essential that the Licensee observe proper maintenance practices for the correct, long-term operation of each facility.

2.5 Post-Construction Evaluation and Monitoring Plan. Prior to completion of the fish facilities, the licensee, in consultation with ODFW, USFWS and USFS, shall prepare and implement a post-construction hydraulic evaluation plan, monitoring plan, and implementation schedule for upstream and downstream fish passage facilities. The written plan shall be submitted to ODFW, USFWS and USFS at least 90 days prior to completion of the upstream and downstream fish passage facilities. ODFW, USFWS and USFS shall be allowed at least 30 days for review. The Licensee shall incorporate any recommendations or edits into the plan, or provide reason for not incorporating any recommendations, and allow ODFW, USFWS and USFS 30 days to review and approve the final plan. The plan shall include a (1) short-term hydraulic evaluation that ensures that the performance of the facilities is consistent with the design criteria, and (2) a long-term monitoring plan and implementation schedule that ensures performance is maintained and design criteria are met throughout the license term. If the results of the hydraulic evaluation or monitoring indicate that performance criteria are not being met, then the licensee shall consult with ODFW, USFWS and USFS to

develop recommendations to bring the facilities into compliance with applicable agency criteria as quickly as possible, but no later than 30 days after acquiring information indicating non-compliance, including a schedule for implementing the measures. The recommended measures and implementation schedule shall be filed with the Commission after approval by ODFW, USFWS and USFS. Measures to bring the screens into compliance with the standards may include, but are not limited to, improved hydraulic balancing of screens or structural modifications, seasonal Project shutdown, or reduction in flow diversion. Any measures to bring the screens into compliance may be required for the remaining term of the license or may be required temporarily until alternative measures are implemented to achieve the design performance.

Justification:

Hydraulic and biological evaluations of fish passage facilities are necessary to confirm that the facilities are operating within the hydraulic design criteria. The results of hydraulic and biological evaluations will provide the basis for determination of whether additional modifications or measures are necessary to make improvements to the facility. Adjustments are often required with new or modified facilities to achieve optimal fish passage conditions. For instance, operational or structural adjustments may be needed within the new fishway to achieve effective attraction flows at the entrance. For both the upstream and downstream fish passage facility, the Licensee must develop and implement hydraulic evaluation plans to determine fishway system effectiveness and to identify and correct any fish delay, loss, injury, or hydraulic problems that may be present. Results of these evaluations will identify if and where such adjustments are necessary.

Large periodic floods may also modify channel morphology in Rock Creek and/or deposit sediment in and around the upstream and downstream fish passage

structures. Regular monitoring throughout the License will be necessary to ensure that passage conditions at the Project diversion continue to meet fish passage criteria and provide safe, timely and effective fish passage throughout the License.**30(c) Condition 3: Mitigation for Fish Habitat Impacts**

3.1 Project Operation. The Licensee shall operate the Project in run-of-river mode during all times of generation. The automated control system equipment will be set to divert no more than the licensee's total water right for Project (Cert. 4120). The hydraulic capacity of the Project is 13 cfs.

Justification:

The Applicant has proposed the project to operate in run-of-river mode during all times of operation. The Applicant has agreed with the ODFW and other stakeholders to: 1) meet minimum flows, 2) withdraw water up to 13 cfs from Rock Creek into the project pipeline, and

3) ensure any additional water above minimum flow plus 13 cfs will remain as instream flow. If the project deviates from this operation, the Project will not be in compliance with the license and, the project shall cease diverting streamflow and all water shall remain in Rock Creek.

3.2 Minimum Flows without Mitigation. The Project shall ensure a continuous minimum flow from the Rock Creek Hydroelectric Project diversion structure into the Rock Creek bypass reach that meets ODFW's 1992 recommended flows in IS 72194 (see Table 1) until and unless mitigation is approved and completed for the loss of fish habitat (see Recommendation 3.3). The flow recommendations in IS 72194 are the minimum required flows necessary to maintain salmonid populations at their current levels for the purposes of fish migration, spawning, egg incubation, fry emergence and juvenile rearing. These minimum flows shall be provided upon diversion of any water for hydroelectric purposes under this license. If natural inflow to the Project is equal to or less than the required minimum flow, then the project shall cease diverting streamflow and all water shall remain in Rock Creek.

Table 1. Recommended instream flows from Application for Instream Water Right (IS 72194) by Oregon Department of Fish and Wildlife dated January 8, 1992.	
Month/Two Week Interval	Instream Flow (cfs)
January 1-15	9 cfs
January 16-31	9 cfs
February 1-15	9 cfs
February 16-28	15 cfs
March 1-15	20 cfs
March 16-31	20 cfs
April 1-15	20 cfs
April 16-30	20 cfs
May 1-15	20 cfs
May 16-31	20 cfs
June 1-15	20 cfs
June 16-30	15 cfs
July 1-15	12 cfs
July 16-31	12 cfs
August 1-15	9 cfs
August 16-31	9 cfs
September 1-15	9 cfs
September 16-30	9 cfs
October 1-15	9 cfs
October 16-31	9 cfs
November 1-15	9 cfs
November 16-30	9 cfs
December 1-15	9 cfs
December 16-31	9 cfs

Justification:

On January 22, 1992, ODFW applied for an Instream Water Right in Rock Creek for the reach from the location of the historic Rock Creek hydroelectric project (P-1986) to the confluence with the Powder River. This Instream Water Right request (IS-72194) was determined by ODFW to be “the minimum flow required to maintain salmonid

populations at their current levels” based on stream flow analysis using the Oregon Method. No provisions were made within the requested flow for population restoration or enhancement (ODFW 1992). While WRD’s Proposed Final Order was protested (OWRD 1996), ODFW’s proposed Instream Water Right, along with the Project Applicant’s Instream Flow Study, was the basis for negotiation of Project minimum flows in 2011. Therefore, ODFW and stakeholders have agreed to the project use of these IS 72194 minimum flows if a Fish Habitat Mitigation Plan is not in place. The flow recommendations in IS 72194 are the minimum required flows necessary to maintain salmonid populations at their current levels for the purposes of fish migration, spawning, egg incubation, fry emergence and juvenile rearing. Additional data on temperature may indicate additional minimum flows are needed to support fish habitat during low flow periods.

3.3 Mitigation for Loss of Fish Habitat. The Licensee may implement the minimum flows from Table 2 if the Licensee provides mitigation for the loss of instream fish habitat in lieu of providing flows under Recommendation 3.2. In this case, the Licensee shall revise the Fish Habitat Mitigation Plan in Appendix B of the FLA (Mitigation Plan) consistent with ODFW Fish and Wildlife Habitat Mitigation Policy goals and objectives for Habitat Category 4 (see OAR 635, Division 415: <https://www.dfw.state.or.us/OARs/415.pdf>). The Licensee shall revise the Mitigation Plan to identify the project’s impact on fish habitat resulting from the lesser bypass flow and the mitigation project(s) as described below in A through C, consistent with ODFW Fish and Wildlife Habitat Mitigation Policy mitigation plan requirements pursuant to OAR 635- 415-0020 (8). The Licensee shall solicit participation from interested stakeholders including, but not limited to ODFW, USFWS, USFS and ODEQ, and schedule and convene one (or more) meeting(s) to discuss and agree upon revisions to the Mitigation Plan, including the Licensee’s proposed mitigation project(s). The Licensee shall revise the Fish Habitat Mitigation Plan, as recommended by the stakeholders, and distribute to the stakeholders for review. The Licensee shall allow at least 30 days for stakeholder review and comment, and shall

incorporate any recommended edits. Upon approval of the revised Mitigation Plan by the stakeholders, the Licensee shall submit the revised Mitigation Plan to the Commission. The Licensee shall implement the mitigation project(s) and monitor and maintain the mitigation project(s) for the term of the License.

- (A) The revised Mitigation Plan shall address impacts to redband trout juvenile and adult rearing and spawning habitat, including:
 - a. The location, physical and operational characteristics and the duration of the development action (i.e. Rock Creek Hydroelectric Project as described in the FLA); and
 - b. The nature, extent and duration of the impacts expected to result from the proposed development action.
- (B) The agreed-upon categories of acceptable mitigation projects include legal protection of instream flows, fish passage barrier improvements and fish habitat restoration.
- (C) The revised Mitigation Plan shall include a clear and detailed description of proposed in-kind or out-of-kind, in-proximity or off-proximity habitat mitigation project(s) including:
 - a. Detailed location of the proposed mitigation project(s) including coordinates (i.e. latitude, longitude, township, range, section, quartersection and county) and a map;
 - b. The benefits of proposed fish habitat mitigation project(s), including A clear and detailed explanation of how the proposed project(s) would result in no net loss in either pre-development habitat quantity or quality;
 - c. A comparison of the flow, amount and quality of the habitat at the mitigation site with the impacted site; and
 - d. Protocols, methods, and a reporting schedule for monitoring the effectiveness of the mitigation project(s), and performance measures including success criteria and a timeline for formal determination that the mitigation goals and standards have been met, provision for long-term protection and management of the mitigation site(s) and a reporting schedule for identifying progress toward achieving the mitigation goals and standards.

Justification:

It is the policy of ODFW, under its Fish and Wildlife Mitigation Policy to require mitigation for losses of fish and wildlife resulting from development actions (OAR

635-415-0010). The project will cause the loss of fish habitat due to the diversion of 13 cfs for project operation. The Fish Habitat Mitigation Plan provided by the license applicant in Appendix B of the FLA is incomplete. Therefore, the Applicant must revise the Fish Habitat Mitigation Plan to be consistent with ODFW’s Fish and Wildlife Mitigation Policy and coordinate this revision with the USFWS and other stakeholders including, but not limited to the USFWS, USFS, ODFW ODEQ, and OWRD.

3.4 Minimum Flows with Mitigation. Upon completion of approved mitigation to mitigate for the loss of fish habitat established under the revised Fish Habitat Mitigation Plan in Recommendation 3.3, the Licensee may adjust project operation to ensure a continuous minimum flow from the Rock Creek Hydroelectric Project diversion structure as set forth in Table 2. If natural inflow to the Project is equal to or less than the required minimum flow, then the project shall cease diverting streamflow and all water shall remain in Rock Creek.

Table 2. Instream flows (cfs) for Rock Creek as measured at the diversion structure (with mitigation).	
Month/Two Week Interval	Instream Flow (cfs)
January 1-15	6 cfs
January 16-31	6 cfs
February 1-15	6 cfs
February 16-28	6 cfs
March 1-15	6 cfs
March 16-31	8 cfs
April 1-15	10 cfs
April 16-30	12 cfs
May 1-15	20 cfs
May 16-31	20 cfs
June 1-15	20 cfs
June 16-30	15 cfs
July 1-15	15 cfs
July 16-31	15 cfs
August 1-15	12 cfs
August 16-31	12 cfs

September 1-15	7 cfs
September 16-30	6 cfs
October 1-15	6 cfs
October 16-31	6 cfs
November 1-15	6 cfs
November 16-30	6 cfs
December 1-15	6 cfs
December 16-31	6 cfs

Justification:

ODFW, USFWS, USFS, ODEQ, and OWRD negotiated minimum flows with the Applicant, and agreed that if these negotiated flows are the minimum flows applied to the Project, then a mitigation plan would be required that would result in no net loss of fish habitat. Thus, the Licensee must complete approved mitigation established under the revised Fish Habitat Mitigation Plan in Recommendation 4.3, then the Licensee may adjust project operation to ensure a continuous minimum flow (negotiated minimum flows) from the Rock Creek Hydroelectric Project diversion structure as set forth in Table 2. If natural inflow to the Project is equal to or less than the required minimum flow, then the project shall cease diverting streamflow and all water shall remain in Rock Creek.

The minimum flow was negotiated, starting in 2011, based upon the results of the Instream Flow Study, which applied PHABSIM techniques to simulate available habitat and compare habitat across a range of flows (EOLP 2010, Craven 2010a, Craven 2010b). The project proponent at the time (EOLP) and the stakeholders met numerous times in January, April, June and July of 2010, to attempt to reach

agreement on minimum flows. The stakeholders were willing to accept minimum flows lower than they had initially proposed (based, in part on ODFW Instream Water Right (ODFW 1992)), if the applicant also provided mitigation for the loss of fish habitat caused by the project diversion of flow. The goal of minimum Rock Creek instream flows is for the protection, mitigation, and enhancement of fish and wildlife resources and to sustain well- connected functional riparian and aquatic habitats to which the native aquatic and riparian community is adapted.

3.5 Minimum Flow Compliance Point. The Licensee shall install, operate and maintain a gauging station in the Rock Creek bypass reach. The gauging station shall be located at the diversion weir at the top of the bypassed reach. The flow gage shall provide for continuous real- time recording of flow in the bypass reach measured at 15-minute intervals and reported as an hourly average (top of the hour average) during the duration of the hydropower license. The flow gage shall be established in conformance with U.S. Geological Survey (USGS) criteria and maintained through the life of the project license. Prior to initial operation of the Project, the Licensee, in consultation with, and subject to approval of, ODFW, ODEQ, USFS, and USFWS, shall prepare, and file for Commission approval, a gauge installation and data reporting plan. Upon Commission approval, the Licensee shall implement the plan. Within three (3) months following the close of each water year during the term of the new License, the Licensee shall provide to the ODFW, USFWS and USFS a written report of the daily average flow records for the preceding water year.

Justification:

The measurement of instream flow by the Licensee is necessary to ensure compliance with minimum flow requirements. The rating curve should accommodate a wide range of flows in order to provide information over the life of the license and the occurrence of flows that facilitate channel maintenance, sediment transport and other necessary ecosystem functions. Relatively high flows generally occur in the Rock Creek reach

May through June. Daily flow records will allow assessment of flow patterns over time and provide data that can be used to evaluate ecosystem function. Further, a long-term record of flow patterns will be particularly important to document the local effects of climate change.

Locating the instream flow compliance point within the reach occupied by redband trout and habitat for both redband and bull trout provides assurance that the benefit of the minimum flow requirement is being realized by the populations it is intended to benefit. In the Minimum Flow Plan, in Appendix B of the FLA, the Applicant proposes to locate the gaging station at the diversion weir, and ODFW agrees that just downstream of the diversion weir is the best location to most accurately measure the flow bypassed by the project and monitor ramping caused by project operations.

30 (c) Condition 4: Operation and Maintenance Plan

The Licensee shall develop a written Operation and Maintenance Plan (including operator training and supervision) that explicitly list the procedures needed to maintain minimum instream flows, adhere to specified ramping rates, and operate and maintain the upstream and downstream fish passage facilities. The Operation and Maintenance Plan should include procedures for prior notification and coordination with ODFW regarding maintenance scheduling, a contingency plan for emergencies that affect fish and wildlife resources and notification of ODFW when minimum flow violations occur. The Licensee, in consultation with, and subject to approval of, ODFW, ODEQ, USFS, and USFWS shall prepare, and file with the Commission, the Operation and Maintenance Plan. The Licensee shall implement the plan.

Justification:

The Licensee proposes several operation and maintenance actions that will affect fish and aquatic resources such as minimum flow, and upstream and downstream passage. The FLA does not explicitly state how the Licensee will achieve its proposed actions. An Operation and Maintenance Plan reviewed and approved by the USFWS, USFS, ODFW, ODEQ, and OWRD, will help ensure that impacts to fish and aquatic resources are minimized.

Upstream and downstream fish passage structures are subject to continuous operations and harsh riverine and climatic conditions. Because redband trout spawning and rearing habitat is present in Rock Creek at the proposed proposed facilities, proper maintenance of the fish passage systems is necessary to ensure the movement of fish in completing their biological requirements, including fish migration, spawning, egg incubation, fry emergence and juvenile rearing (NMFS 2011). Effective operation and performance of the Project's fish passage systems are dependent on regular inspection and maintenance to assure proper operating conditions within each fish passage feature. Wear and tear, corrosion, accumulation of sediment and debris, and various other factors decrease the effectiveness of the fishway's physical features. If left untreated, these factors would increase fish losses. In addition, care must be extended during inspection and maintenance activities to ensure any migrating fish that occur in the Project's fish passage systems are salvaged and transported safely, if necessary. It is therefore essential that the Licensee observe proper maintenance practices for the correct, long-term operation of each facility.

30 (c) Condition 5: Ramping Rates

The Licensee shall operate the Project to minimize Project-induced flow fluctuations in the Rock Creek bypass reach. The Licensee shall operate the Project to adhere to ramping restrictions in the bypass reach not to exceed 1 inch per hour from May 1 to October 31 to protect larval fish and 2 inches per hour from November 1 to April 30 to protect juvenile and adult rearing. Ramp rates shall apply during all project start-up or shut-down activities. Procedures required to adhere to ramping rates shall be included in the Operation and Maintenance Plan identified in Condition 4.

Justification:

Sudden flow changes in stream reaches due to Project operations can adversely impact fish and aquatic resources. Project operations can result in down-ramping in the Rock Creek bypassed reach by rapidly opening the headgate and diverting flow into the penstock, which will reduce the flow over the diversion structure and into Rock Creek. Significant rapid flow reduction in the Rock Creek bypass reach could affect fish populations by stranding eggs, fry or juvenile fish. Down ramping of only 1-inch per hour can impact fish populations (Hunter 1992). One very significant ramping event at a critical life history timing can cause a significant limiting condition (injury or death) for one or more age classes of fish, or impact long-term habitat conditions within a reach.

The Project will be operated as run-of-river, which can cause flow fluctuations in downstream reaches as a result of low flow shutdowns, start-up, powerhouse failure,

intake failure, cycling and forebay surges. Failures may be a result of debris load on the screens, failure of screen cleaning methods to work properly, valve failure and/or gate malfunctions. Salmonid fry are weak swimmers and tend to use slower velocity habitat found along shorelines, gravel bars or other gently sloping areas. Fry using these lower velocity shallow habitats are particularly sensitive to changes in flow, especially rapid vertical changes in water level. Redds can be dewatered, fry and juvenile fish can be stranded and other aquatic organisms can be negatively affected by rapid increases or decreases in flow. The implementation of ramping rates will help to minimize and potentially avoid the loss of downstream aquatic resources by regulating the rate and magnitude of Project-related flow fluctuations to no more than those ramping rates required by the License.

30 (c) Condition 6: Water Quality

The Licensee shall meet all federal and state water quality standards required by the Clean Water Act in accordance with the water quality certification issued by Oregon Department of Environment Quality (ODEQ) under section §401 of the Clean Water Act.

Justification:

The Project may have short- and long-term effects to water quality, including water temperature and turbidity. To protect fish and wildlife resources, the Licensee must implement measures to minimize any water quality impacts from the construction and operation of the Project.

Oregon's water quality standards are designed to protect the beneficial uses of Oregon's water resources, which include fish and wildlife. Violations of water quality standards can impair fish populations including resident and migratory species. ODEQ's Clean Water Act Section 401 Water Quality Certification will include measures to minimize water quality impacts and address water quality issues that protect fish and wildlife resources.

ODFW supports ODEQ's review the draft Water Quality Management Plan for the Rock Creek Hydroelectric project submitted by GeoSense (for the Applicant) on September 17, 2019, as well as the Heat Source modeling information for the project, submitted on June 21, 2019. GeoSense stated that they have not been able to get adequate results from the Heat Source model to develop a relationship between flow in the project by-pass reach of Rock Creek and the change in water temperature through the by-pass reach (ΔT). The draft Water Quality Management Plan was developed as an alternative to stream temperature modeling, in order for the project to meet the State of Oregon water quality standards. The amount of warming caused by the project is limited to a maximum of 0.3° C (ODEQ 2019).

ODEQ has not been able to establish a reasonable method of ensuring compliance with State Water Quality Standards based on the draft Water Quality Management Plan. Specific comments on the draft plan from ODEQ Water Quality Standards Section staff are included in ODEQ 2019. If the plan is included in an application for Section 401 Water Quality Certification, ODEQ will likely have to decide

whether to deny the project a water quality certification or establish conservative minimum flow levels in the by-pass reach during the summer months. Minimum flow values in certification conditions would likely range between 20-25 cubic feet/second during the months of June-September (ODEQ 2019).

30 (c) Condition 7: Erosion and Sediment Control

Within six (6) months following License issuance and before any ground disturbing construction, the Licensee shall revise the Erosion Control Plan (ECP) described in Appendix B of the FLA to describe the specific rehabilitation techniques and monitoring elements necessary to mitigate all ground disturbing activities during Project construction, operation and maintenance for the life of the License. The ECP shall include site-specific erosion control measures that will be implemented at the following locations: the new diversion and intake structure, which will include fish passage and screen facilities and a concrete pipeline intake structure, 11,400 feet of new buried pipeline with elevated pipe sections and associated footings, new powerhouse site, new transmission line and interconnection site. In addition to the measures described in the ECP in Appendix B, the ECP shall include measures A through J below. The Licensee shall consult with ODFW, USFWS, USFS and ODEQ on revisions to the ECP and, and upon the approval by ODFW, USFWS, USFS and ODEQ, file it for Commission approval. Upon Commission approval, the Licensee shall implement the ECP.

- A. Site-specific industry-standard best management practices (BMPs) (for example: see Forest Service National Best Management Practices for Water Quality Management on National Forest System Lands (https://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf) BMPs for Facility Construction and Stormwater Control), including dust abatement during construction.
- B. All disturbed soils shall be graded and revegetated as soon as possible following ground disturbance, with priority given to native species that are locally adapted.
- C. For three (3) years following completion of any Project-related construction or ground disturbance, monitor sediment and erosion control measures for compliance with performance measures described below in (D).
- D. The Licensee shall ensure that the following performance measures are met: (a) ground cover in disturbed area equals or exceeds 80 percent of that within an

undisturbed control area that has similar vegetation and is adjacent to the Project area; and (b) species composition in disturbed areas equals or exceeds 75 percent non-weedy species. (c) Soil erosion areas shall be reported if rills exceed two (2) inches in depth or six (6) inches in width. If soil erosion is detected, the Licensee shall implement erosion control measures consistent with the ECP to remedy the erosion.

- E. If re-vegetation requirements are not met within three (3) years post construction, the Licensee shall consult with resource agency stakeholders to identify and implement measures including, but not limited to reseeded, additional mulch, soil amendments, and supplemental irrigation to ensure establishment of vegetation where required.
- F. For any Project-related construction that requires removal and/or fill actions in waters of the state (i.e. any construction below the ordinary high-water mark or in wetlands), the Licensee shall obtain, as applicable, a removal-fill permit from ODSL, a dredge and fill permit from the US Army Corps pursuant to Clean Water Act (CWA) § 404 and a CWA §401 water quality certification from ODEQ. The in-water work period in Rock Creek is from July 1 through October 31, or as allowed by a variance as approved by ODSL in consultation with ODFW.
- G. For work areas behind temporary cofferdams or isolated work areas below the ordinary high water mark (OHWM) that will be dewatered with pumps, all pumped water shall be discharged to unsaturated upland vegetated areas for infiltration. Infiltration areas shall be monitored daily by a qualified Construction Inspector to ensure that all discharged water is infiltrating and there is no erosion, surface or subsurface runoff occurring. If an area becomes saturated an alternative discharge area shall be located.
- H. All construction debris shall be properly disposed of on land so that the debris cannot enter the waterway or cause quality degradation of state waters. Retention areas, swales or impoundments shall be used to prevent discharge of water from construction staging areas.
- I. The Licensee shall take measures to ensure that any Project-related construction will not increase turbidity and sediment discharge into Rock Creek, including during construction of the diversion structure, downstream and upstream passage facilities, powerhouse and tailrace. The Licensee shall mitigate any increased turbidity or sediment due to Project- related construction.
- J. In the event of future construction activities associated with the Project, the Licensee shall consult with ODFW, USFS, USFWS and ODEQ 90 days before commencing any Project-related land-clearing, land disturbing, or spoil-producing activities, and incorporate the agency recommendations into a

comprehensive plan to control erosion, dust, and slope stability and to minimize the quantity of sediment or other potential water pollutants resulting from Project construction, spoil disposal, and Project operation and maintenance.

Justification:

Ground disturbing activities during maintenance or construction of new facilities could increase turbidity and sedimentation levels in Rock Creek and cause direct and indirect impacts to riparian and aquatic habitats. Suspended sediment may interfere with the biological functions of fish and other aquatic organisms by inhibiting respiration and feeding. The ECP will ensure that proper measures are in place to reduce erosion and limit sediment from entering waterways in the Project area and protect water quality, fish and fish habitats.

The ECP will also help prevent surface contaminants from entering Rock Creek due to ground disturbing activities, while helping to reduce soil erosion, slope instability issues, dust contamination, and degradation of water quality. The design and implementation of an effective ESCP, utilizing current Best Management Practices, will ensure that these impacts to water quality and natural resources are minimized.

30 (c) Condition No. 8: Revegetation and Noxious Weed Management

Within 6 months following License issuance and prior to any land disturbing activities, the Licensee shall revise Revegetation Plan included in Appendix B of the FLA, to include measures A through E below. The revised Revegetation Plan shall

describe the Licensee's obligations to reduce construction and operational impacts to native vegetation within the Project area and on adjacent lands, restore native vegetation on any sites impacted by Project activities, and monitor and maintain the Project area for the term of the license to ensure that non-native plants are not introduced. In addition to the measures proposed in the Revegetation Plan, the Revegetation Plan shall specify weed prevention and treatment strategies that will be employed on all ground disturbed by project activities. The Licensee shall consult with ODFW, USFWS, USFS and ODEQ on revisions to the Revegetation Plan and, and upon the approval by ODFW, USFWS, USFS and ODEQ, file it for Commission approval. Upon Commission approval, the Licensee shall implement the ECP.

- A. The Licensee shall implement appropriate industry-standard invasive plant and noxious weed BMPs to prevent the establishment or spread of invasive, non-native plants and noxious weeds in the Project area from Project-related activities.
- B. The Licensee shall implement noxious weed control measures and/or coordinate noxious weed control with appropriate resource agencies including, but not limited to the ODFW and USFS, to ensure that all disturbed areas affected by Project activities are appropriately treated for noxious weeds.
- C. The Licensee shall monitor for noxious weed presence and re-vegetation efforts for three (3) years post construction and every other year thereafter (i.e. years 5, 7 and 9 following construction) on all lands within the Project boundary and buffers areas described in FLA Appendix B including, USFS Road #5520, diversion dam site and associated fish passage facilities, the 11,400-foot pipeline corridor, new powerhouse site and 500-foot transmission line corridor and interconnect site. Ten years following license issuance, the Licensee may consult with ODFW, USFWS, USFS and ODEQ to determine the necessity of continuing noxious weed and revegetation monitoring based on all previous monitoring information.
- D. All soil disturbed during project construction shall be replanted using an approved seed mix or native plants approved by ODFW, USFS and USFWS. The Licensee shall ensure that (a) ground cover in disturbed areas equals or exceeds 80 percent of that in an undisturbed control area with similar vegetation and is adjacent to the Project area; and (b) species composition in disturbed areas equals or exceeds 75 percent non-weedy species.
- E. If re-vegetation requirements are not met within three (3) years post construction, the Licensee shall consult with Stakeholders to identify and implement measures including, but not limited to reseeded, additional mulch, soil amendments and supplemental irrigation to ensure establishment of vegetation where required.

Justification:

Disturbances associated with the construction, operation and maintenance of the Project will impact terrestrial habitat and result in the removal of native vegetation, increasing the potential for introduction of non-native vegetation and impacts to those wildlife species that depend on the native vegetation. Reduction in native vegetation, as well as increased potential for introduction of non-native vegetation, may potentially impact those wildlife species that depend on them for forage and habitat. The Revegetation Plan must identify specific actions that the Licensee will undertake for the life of the license to ensure that noxious and invasive plants are not introduced to the Project area and that native plant communities are restored and maintained for the life of the license. Periodic monitoring for noxious and invasive plants will ensure prompt and appropriate actions as identified in this condition to control, suppress, contain, and eradicate these plants, reducing impact to native plant communities and wildlife habitat and ensuring Project impacts to native plant communities from any noxious or invasive plants would be minimized.

30 (c) Condition No. 9: Terrestrial Wildlife Resources

Within 6 months following License issuance and prior to any ground disturbing construction, the Licensee shall develop a Terrestrial Wildlife Resource Management Plan (TWRMP) to minimize the impacts of Project construction, operation and maintenance to wildlife. The Licensee shall consult with ODFW, USFS and USFWS to identify project activities that will result in permanent loss of terrestrial habitat and

locations to mitigate for project impacts to terrestrial wildlife habitat such that there is no net loss of terrestrial wildlife habitat. The Licensee, in consultation with, and subject to the approval of, ODFW, USFS and USFWS shall prepare, and file for Commission approval, the TWRMP. Upon Commission approval, the Licensee shall implement the TWRMP.

Revegetation Plan included in Appendix B of the FLA proposes to remove trees within the Diversion Construction Area and along the Low pressure Pipeline Route. TWRMP shall identify the timing of tree removal, which shall occur outside of active nesting periods (March 1 to July 30).

The TWRMP shall include measures to minimize adverse interactions between Project activities and birds, including Project construction, operation and maintenance. Power line construction and maintenance shall occur outside the nesting season and all transmission lines shall be constructed to prevent accidental electrocution and provide safe bird perching. All new or rebuilt power poles shall be constructed and maintained in accordance with the Avian Protection Plan Guidelines (APPG 2005), which is intended to be used in conjunction with *Suggested Practices for Raptor Safety on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012). These standards should be applied to all transmission line upgrades.

Justification:

Project related construction activities will affect terrestrial wildlife and their habitats.

As proposed in the FLA, the primary adverse effect on wildlife would be vegetation disturbance, noise and increased human activity during construction. The FLA states that short-term habitat losses will total 5.35 acres. The transmission line from the powerhouse to existing lines will be 350 feet long. The Project states that there will be a long-term vegetation loss of 0.07 acres. The removal of approximately 0.75

miles of wooden flume would have short-term noise affects with long-term benefits to wildlife habitat. Project operation and maintenance activities will cause noise impacts to wildlife. However, the FLA does not propose mitigation for affected habitat.

Further, construction activities at the Project site could affect avian species in the Project area. Noise from construction-related activities, traffic and workers can disturb birds during sensitive periods and cause nest failure. Construction-related disturbances can also negatively impact feeding, foraging and migratory activities for these birds. The development of a TWRMP, as described in this condition will address these impacts and allow for development of necessary mitigation. The application of strict monitoring, construction timing and adherence to developed guidelines as required by the above recommendation would minimize the Project's impact on raptors and other wildlife species and assure that any negative effects that may occur would be minor or temporary.

30 (c) Condition 10: Spring Connectivity and Wetland Impact

The Licensee shall develop a strategy to mitigate for any permanent loss or disturbance of wetland or spring habitat. Prior to any ground disturbing activities, the Licensee shall delineate all wetland areas within the project boundary including the proposed pipeline route with elevated sections and associated footings. The Licensee shall consult with ODFW, USFS and USFWS to identify locations to mitigate for the permanent loss of wetland habitat associated with construction of the tailrace channel resulting in no net loss of wetland habitat. The Licensee shall remove noxious weeds and re-vegetate the wetland mitigation site(s) consistent with the Revegetation Plan as described in Recommendation 8.

Justification:

The Applicant states that a seasonal spring located where the pipeline crosses a topographic draw (about 2,500 feet from Rock Creek) would be spanned with an overhead pipe. Pipe supports would be placed outside the seep area. A similar configuration would be used at the smaller topographic draw located about 1,700 feet from Rock Creek, allowing undisturbed flow of water during spring runoff. With this pipeline design no wetlands areas would be disturbed. Adjacent upland areas would be recovered under Revegetation Plan measures. If this proposed activity does not occur as proposed, and/or if additional springs and wetland habitat are located in the Project area and cannot be protected, the ecological value of the habitat will be reduced. This type of permanent impact requires mitigation by the Licensee in accordance with ODFW's Fish and Wildlife Mitigation Policy (OAR 635-415-0000 through 0025). Mitigation areas should be selected for in-kind replacement of lost wetland habitat features and in the general proximity of Project impacts and will require close coordination with ODFW and other resource agencies.

30 (c) Condition 11: Emergency or Special Conditions

In the event that an accidental spill of reportable quantity of a hazardous material, as defined by ODEQ, or other potential emergency event occur, the Licensee shall notify the Oregon Emergency Response System within 24 hours of the event with a verbal report on location, duration, and effect on water quality and aquatic life.

If at any time, unanticipated circumstances or emergency situations arise in which the Licensee observes or suspects that fish or wildlife are being killed, harmed or endangered by any of the Project facilities or as a result of Project operation, the Licensee shall immediately take appropriate action to prevent further loss in a manner

that does not pose a risk to human life, limb, or property. The Licensee shall, within 24 hours, notify ODFW, ODEQ, USFS, and USFWS and comply with any restorative measures required to the extent such measures do not conflict with the conditions of this License. The Licensee shall notify the Commission as soon as possible but no later than 10 days after each occurrence and inform the Commission as to the nature of the occurrence and restorative measures taken.

Justification:

The New License should include conditions that require the Licensee to notify the appropriate fish and wildlife agency when emergency or special situations at Project facilities caused harm or mortality to fish and wildlife species or their habitats. Such notification allows rapid agency response to emergency and special situations, and is necessary to protect and mitigate damages to the state's fish and wildlife resources.

Notification of ODFW of fish or wildlife emergency circumstances is necessary to ensure that it can provide timely recommendations on a case-by-case basis to minimize or avoid ongoing impacts to the state's fish and wildlife resources.

Further, timely consultation with ODFW is critical because no person can collect injured or dead fish and wildlife without the written consent of ODFW.

30(c) Condition 12: Inspection

The Licensee shall grant reasonable access to Project developments and records so that the USFWS and other Stakeholder personnel (ODFW, USFS, ODEQ, and OWRD) will be able to inspect fishway facilities and evaluate fishway performance, inspect any habitat mitigation and evaluate habitat restoration success, and inspect and evaluate Project operations required by this license.

Justification:

This access for evaluations and inspections will allow the USFWS and other Stakeholder personnel to help optimize facility performance. Thus, the Department requires the Licensee to grant the USFWS, ODFW, USFS, ODEQ, and OWRD (stakeholders) reasonable access to Project developments and records.

30(c) Condition 13: Reservation of Authority

ODFW reserves the right and opportunity to amend, modify or add to these recommendations, terms and conditions if resource conditions change, Project plans are altered, or new information is developed as appropriate to carry out its responsibilities with respect to fish and wildlife resources.

Justification:

New information developed through project inspections, new studies or information specific to the Project or about Rock Creek (for example, if bull trout are found in the headwaters) may make it necessary to add, delete or modify these terms and conditions. This reservation of authority allows ODFW to consider such additional information and data as it becomes available; to respond to changed circumstances; and modify the existing terms and conditions as may be necessary to protect fish and wildlife resources affected by the Project.

30(c) Condition 14: Documentation of Bull Trout in Project Area

The Licensee shall document all bull trout observed or collected in the Project area. The data shall include: 1) number of bull trout, 2) size (length), 3) location (GPS if available), 4) if the bull trout were alive or dead, 4) date, and 5) name of person that observed the fish. The Licensee shall provide this information within seven (7) business days to the USFWS, ODFW, and the USFS. The Licensee shall provide an annual summary of total bull trout documented in Rock Creek for the year, including associated data described herein, in an annual report to the stakeholders at least 30

days prior to the Annual Resource Coordination Meeting (as described in Condition 1).

Justification:

Bull trout are federally listed as threatened and state listed as a Sensitive Species-Critical (ODFW 2017). To date, one bull trout/brook trout hybrid documented in 1994 is the only documentation of potential bull trout presence in Rock creek. Additional data collection on bull trout presence/absence is needed for this watershed. If bull trout are observed or collected in the project area, this is important information to collect and report to the USFWS, ODFW, and the USFS. Thus, the Department requires the Licensee to document bull trout observed or collected in the Project area, during the Project License, as described above.

30(c) Condition 15: Temporary Stream Crossings

Within six (6) months following License issuance and before any ground disturbing construction, the Licensee shall consult with the USFWS, USFS, ODFW, and DEQ for prior approval of locations and designs for construction of temporary stream crossings to be used during Project construction activities, including, but not limited to, pipeline construction.

Justification:

Rock Creek provides cold and clean water habitat for redband trout, including spawning and rearing habitat for redband trout. Consultation and prior approval of the

locations and construction of temporary stream crossings for Project activities with the above agencies will help minimize impacts to Rock Creek native fish populations, habitat, and limit impacts to water quality (sediment/turbidity, and chemical contamination).

CONCLUSION

ODFW expects the Project to continue allow for acceptable quality and quantity of fish habitat for redband trout in Rock Creek over the license period. ODFW believes the Project may be licensed and operated in a manner that is consistent with ODFW's policies and goals, provided ODFW are terms and conditions are incorporated into the license, and provided the Project is in compliance with all other applicable state and federal environmental laws and policies.

Therefore, ODFW does not object to the issuance of a new license for the Project with ODFW terms and conditions (and reservation of authority to modify conditions) fully incorporated into the License, pursuant to Section 30(c) of the FPA. We encourage the Commission and the Licensee to continue consultation and coordination with ODFW, ODEQ, FWS and USFS, including further evaluation of measures to minimize the impact of the Project on fish, wildlife and other environmental values in the Project area.

APPENDIX E – LIST OF COMPREHENSIVE PLANS

- Bureau of Land Management. 2015. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment – Attachment 3. Portland, Oregon. September 2015.
- Bureau of Land Management. 2015. Record of Decision and Approved Resource Management Plan for the Great Basin Region, Including the Greater Sage- Grouse Sub-Regions of Idaho and Southwestern Montana, Nevada and Northeastern California, Oregon, and Utah. Washington, D.C. September 2015.
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- Bureau of Land Management. 1993. Donner and Blitzen National Wild and Scenic River management plan. Department of the Interior, Hines, Oregon. May 1993. 116 pp.
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- Oregon Department of Fish and Wildlife. 1987. Warm water game fish management plan. Portland, Oregon. August 1987. 60 pp.
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- Oregon Department of Fish and Wildlife. 1995. Biennial report on the status of wild fish in Oregon. Portland, Oregon. December 1995. 217 pp. and appendix.
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- Oregon Department of Fish and Wildlife. 2006. Oregon conservation strategy. Salem, Oregon. February 2006.
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- Oregon Department of Fish and Wildlife. 2003. Oregon's elk management plan. Portland, Oregon. February 2003.
- Oregon Department of Fish and Wildlife. 2006. Oregon cougar management plan. Salem, Oregon. April 2006.
- Oregon Department of State Lands. 2003. Oregon natural heritage plan. Salem, Oregon.
- Oregon Department of Transportation. State Parks and Recreation Division. 1985. Grande Ronde and Willowa River scenic waterway study. Salem, Oregon. June 1985. 51 pp. and appendices.
- Oregon State Game Commission. 1963-1975. Fish and wildlife resources - 18 basins. Portland, Oregon. 21 reports.
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- Oregon State Water Resources Board. 1973. Surface area of lakes and reservoirs. Salem, Oregon. 43 pp.
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