FERC/EIS-0331D

DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR HYDROPOWER LICENSE

Goldendale Energy Storage Project—FERC Project No. 14861-002

Washington and Oregon

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

U.S. Army Corps of Engineers, Portland District

March 2023

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
OFFICE OF ENERGY PROJECTS

To the Agency or Individual Addressed:

Reference: Draft Environmental Impact Statement

Attached is the draft environmental impact statement (draft EIS) on the application for the proposed Goldendale Energy Storage Project (No. 14861-002). The closed-loop pumped storage project would be located approximately 8 miles southeast of the City of Goldendale, Klickitat County, Washington, with transmission facilities extending into Sherman County, Oregon. The project would occupy 18.1 acres of lands owned by the U.S. Army Corps of Engineers and administered by the Bonneville Power Administration.

This draft EIS documents the view of governmental agencies, non-governmental organizations, affected Native American Tribes, the public, the license applicant, and Federal Energy Regulatory Commission (Commission) staff. It contains staff evaluations of the applicant's proposal and the alternatives for licensing the Goldendale Energy Storage Project.

Before the Commission makes a licensing decision, it will consider all concerns relevant to the public interest. The draft EIS will be part of the record from which the Commission will make its decision. The draft EIS was sent to the U.S. Environmental Protection Agency and made available to the public on or about April 7, 2023.

The U.S. Army Corps of Engineers (Corps) participated as cooperating agency to prepare the EIS. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the National Environmental Policy Act (NEPA) analysis. The EIS is intended to fulfill the cooperating federal agencies' NEPA obligations, as applicable, and to support subsequent conclusions and decisions made by the Corps. Although the Corps provided input to the conclusions and recommendations presented in this final EIS, the Corps may present its own conclusions and recommendations in any respective record of decision or determination for the project.

At this time, the Commission has suspended access to the Commission's Public Reference Room due to the proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19) issued by the President on March 13, 2020. The draft EIS also may be viewed on the Commission's web site at http://www.ferc.gov under the eLibrary link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCOnlineSupport@ferc.gov, (866) 208-3676 (toll free), or (202) 502-8659 (TTY).

Any person wishing to comment on the draft EIS may do so. Comments on the draft EIS must be filed on or before June 6, 2023. The Commission strongly encourages electronic filing. Please file comments, recommendations, terms and conditions, and prescriptions using the Commission's eFiling system at https://ferconline.ferc.gov/FERCOnline.aspx. Commenters can

submit brief comments up to 6,000 characters, without prior registration, using the eComment system at https://ferconline.ferc.gov/QuickComment.aspx. You must include your name and contact information at the end of your comments. For assistance, please contact FERC Online Support at FERCOnlineSupport@ferc.gov, (866) 208-3676 (toll free), or (202) 502-8659 (TTY). In lieu of electronic filing, you may submit a paper copy. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852. The first page of any filing should include docket number P-14861-002.

Attachment: Draft Environmental Impact Statement

COVER SHEET

a. Title:	Environmental Impact Statement for Hydropower License, Goldendale Energy Storage Project – FERC Project No. 14861-002.	
b. Subject:	Draft Environmental Impact Statement	
c. Lead Agency:	Federal Energy Regulatory Commission	
d. Abstract:	FFP Project 101, LLC (FFP) proposes to construct the 1,200-megawatt (MW) Goldendale Project about 8 miles southeast of the City of Goldendale, Klickitat County, Washington. The project would occupy 18.1 acres of federal lands owned by the U.S. Army Corps of Engineers and administered by the Bonneville Power Administration. The remaining 663.5 acres within the project boundary are primarily owned by NSC Smelter, LLC (529.6 acres) but also includes Washington state, BNSF Railway Company and other private lands. Portions of the project's proposed infrastructure (i.e., new lower reservoir and water fill pipeline) would be located on the site of the former Columbia Gorge Aluminum smelter, which is a Resource Conservation and Recovery Act contaminated site that is the subject of ongoing investigation and clean-up by the potentially liable parties (i.e., NSC Smelter, LLC and Lockheed Martin Corporation) as overseen by Washington Department of Ecology. The project would be operated as a closed-loop pumped storage facility cycling water between two newly constructed reservoirs. The water to initially fill and periodically maintain the reservoirs would be purchased from Klickitat Public Utility District (Klickitat PUD) using a Klickitat PUD-owned conveyance system that draws water from the Columbia River. The initial fill would require 7,640 acre-feet of water and would be completed in about six months at an average flow rate of approximately 21 cubic feet per second. It is estimated that the project would need 360 acre-feet of water each year to replenish water lost through evaporation and seepage. The project would provide an estimated annual generation of 3,561,000 megawatt-hours. FFP proposes to develop or finalize plans to protect and mitigate the environmental effects of project construction and operation on the following: soils, water quality, wildlife and wildlife habitat, public safety, traffic, aesthetics, and cultural resources. Staff's recommendation is to license the project as proposed, with certain staff modifications and additional measures recommended by the agencies.	
e. Contact:	Michael Tust Federal Energy Regulatory Commission Office of Energy Projects 888 First Street, N.E. Washington, D.C. 20426 (202) 502-6522	Danielle Elefritz Federal Energy Regulatory Commission Office of General Counsel 888 First Street, N.E. Washington, D.C. 20426 (202) 502-8767
f. Transmittal:	This draft environmental impact statement on an application to construct and operate the Goldendale Energy Storage Project is being made available for public comment on or about April 7, 2023, as required by the National Environmental Policy Act of 1969[1] and the Commission's Regulations Implementing the National Environmental Policy Act (18 C.F.R. pt. 380).	

[1] National Environmental Policy Act of 1969, amended (Pub. L. 91-190, 42 U.S.C. §§ 4321–4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, §4(b), September 13, 1982).

FOREWORD

The Federal Energy Regulatory Commission (Commission), pursuant to the Federal Power Act (FPA)[2] and the U.S. Department of Energy Organization Act[3] is authorized to issue licenses for up to 50 years for the construction and operation of non-federal hydroelectric development subject to its jurisdiction, on the necessary conditions:

> That the project adopted . . . shall be such as in the judgment of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes referred to in section 4(e) . . . .[4]

The Commission may require such other conditions not inconsistent with the FPA as may be found necessary to provide for the various public interests to be served by the project.[5] Compliance with such conditions during the licensing period is required. The Commission's Rules of Practice and Procedure allow any person objecting to a licensee's compliance or noncompliance with such conditions to file a complaint noting the basis for such objection for the Commission's consideration.[6]

[2] 16 U.S.C. §§ 791a–825r, as amended by the Electric Consumers Protection Act of 1986, Pub. L. 99-495 (1986), the Energy Policy Act of 1992, Pub. L. 102-486 (1992), and the Energy Policy Act of 2005, Pub. L. 109-58 (2005).

[3] Pub. L. 95-91, 91 Stat. 556 (1977).

[4] 16 U.S.C. § 803(a).

[5] 16 U.S.C. § 803(g).

[6] 18 C.F.R. § 385.206 (2022).

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ACRONYMS AND ABBREVIATIONS

Advisory Council	Advisory Council on Historic Preservation
AIR	additional information request
APE	area of potential effects
APP	avian protection plan
Bird and Bat Management Plan	bird and bat reservoir deterrent management plan
Eagle Protection Act	Bald and Golden Eagle Protection Act
BiOp	Biological Opinion
BLM	U.S. Bureau of Land Management
BMP	best management practice
B.P.	Before Present
BPA	Bonneville Power Administration
BIA	Bureau of Indian Affairs
ºC	degrees Celsius
certification	water quality certification
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
CGA	Columbia Gorge Aluminum
CO2e	carbon dioxide equivalent
Commission	Federal Energy Regulatory Commission
Corps	U.S. Army Corps of Engineers
CRP	Cultural Resources Program
Umatilla Tribes	Confederated Tribes of the Umatilla Indian Reservation
Warm Springs Tribes	Confederated Tribes of the Warm Springs Reservation of Oregon
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EIS	environmental impact statement
Environmental Groups	Columbia Riverkeeper, Washington Chapter of the Sierra Club, and Washington Environmental Council
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
ºF	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FFP	FFP Project 101, LLC or applicant
FHWA	Federal Highway Administration
FLA	final license application
Forest Service	U.S. Department of Agriculture, Forest Service
FPA	Federal Power Act

FR	Federal Register
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
GWh	gigawatt-hour
HPMP	Historic Properties Management Plan
HPRCSITs	historic properties of religious and cultural significance to Indian Tribes
HUC	hydrologic unit code
Interior	U.S. Department of the Interior
KOP	key observation point
Klickitat PUD	Klickitat Public Utility District
kW	kilowatt
kV	kilovolt
MPD	Multiple Property District
mph	miles per hour
msl	mean sea level
MW	megawatt
MWh	megawatt-hour
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service
NOC	notice of construction
NPDES	National Pollution Discharge Elimination System
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
Oregon DFW	Oregon Department of Fish and Wildlife
PA	Programmatic Agreement
RCRA	Resource Conservation and Recovery Act
Reclamation	U.S. Bureau of Reclamation
RM	river mile
ROW	right-of-way
SD1	Scoping Document 1
SD2	Scoping Document 2
SHPO	State Historic Preservation Officer
SPECP	spill prevention and emergency cleanup plan
TCP	traditional cultural property
U.S.C.	United States Code
USGS	U.S. Geological Survey
VMMP	Vegetation Management and Monitoring Plan
VRM	Visual Resource Management
WAC	Washington Administrative Code
Washington AGO	Washington Attorney General's Office
Washington DOE	Washington Department of Ecology
Washington DFW	Washington Department of Fish and Wildlife
Washington DNR	Washington Department of Natural Resources

Washington DOT	Washington Department of Transportation
Washington NHP	Washington Natural Heritage Program
WMP	Wildlife Management Plan
WPNAC	Watershed Professionals Network and Aspect Consulting
WSI	West Surface Impoundment

EXECUTIVE SUMMARY

Proposed Action

On June 23, 2020, FFP Project 101, LLC (FFP) filed an application for a license with the Federal Energy Regulatory Commission (Commission) to construct and operate its proposed 1,200-megawatt (MW) Goldendale Energy Storage Hydroelectric Project (Goldendale Project or project). The closed-loop pumped storage project would be located about 8 miles southeast of the City of Goldendale, Klickitat County, Washington. The project would occupy 18.1 acres of federal land owned by the U.S. Army Corps of Engineers (Corps) and administered by the Bonneville Power Administration (BPA) and 663.5 acres of private and state land. The project would be capable of generating 3,561,000 megawatt-hours (MWh) of electricity annually.

The project would operate as a closed-loop pumped storage system, meaning that once it is filled it would not be connected to an existing surface body of water. Water to initially fill the reservoirs and replace water lost to evaporation would be purchased from the Klickitat Public Utility District (Klickitat PUD) via a new water fill line that would connect to an existing water supply pumping station operated by Klickitat PUD. Klickitat PUD draws water from a pool behind a railroad berm that is hydraulicly connected to Lake Umatilla, the impoundment formed by the Corps' John Day Dam.

Proposed Facilities

The project would involve the construction of new upper and lower reservoirs, an underground conveyance system leading from the upper reservoir to an underground powerhouse with generating/pumping facilities, an underground conveyance system from the powerhouse to the lower reservoir, an access tunnel, a combination underground and overhead transmission line, a substation, and accompanying facilities (see figure 1.1-1).

The upper reservoir would be created by a 175-foot-high, 8,000-foot-long concrete-faced rockfill embankment dam and would have a surface area of 61 acres and storage capacity of 7,100 acre-feet at a maximum surface elevation of 2,940 feet National Geodetic Vertical Datum of 1929 (NGVD 29). The upper reservoir would use a hydraulic asphalt concrete (HAC) liner system to reduce seepage into the embankment and underlying foundation materials. An ungated morning-glory or bell mouth-type vertical concrete intake-outlet structure would withdraw water from the upper reservoir and deliver it to the powerhouse through a 2,200-foot-long, 29-foot-diameter concrete-lined vertical shaft; a 3,300-foot-long, 29-foot-diameter concrete-lined high-pressure headrace tunnel; a 200-foot-long, 22-foot-diameter high-pressure manifold tunnel; and three 600-foot-long, 15-foot-diameter steel/concrete penstocks.

The underground powerhouse would be constructed in a 450-foot-long, 80-foot-wide, 150-foot-high powerhouse cavern and contain three, 400-MW Francis-type pump-turbine units for a total installed capacity of 1,200 MW. Power would be discharged to the lower reservoir through three 200-foot-long, 20-foot-diameter steel-lined draft tube tunnels, each with a bonneted slide gate; a 200-foot-long, 26-foot-diameter concrete-lined low-pressure tunnel; and a 3,200-foot-long, 30-foot-diameter concrete-lined tailrace tunnel with a vertical slide gate.

The lower reservoir would be created by a 205-foot-high, 6,100-foot-long concrete-faced rockfill embankment and would have a surface area of 63 acres and a storage capacity of 7,100 acre-feet at an elevation of 580 feet (NGVD 29).[7] The lower reservoir would be double-lined with interstitial drainage and leak detection, using a geosynthetic liner as the first layer and waterproof concrete liner as the second.

The 7,640 acre-feet of water needed to initially fill the reservoirs and the 390 acre-feet needed annually to make-up for evaporative and any seepage losses would be purchased from Klickitat PUD and obtained through Klickitat PUD's pumping station located on the northwest corner of an intake pool created by a railway embankment paralleling the Columbia River. The pumping station pumps water to an existing water supply vault via a 2-mile-long industrial water conveyance line, also owned by Klickitat PUD. When filling the reservoirs, FFP would open a new shut-off and throttling valve that would be installed in Klickitat PUD's water supply vault which would then convey water to the lower reservoir via a new buried 30-inch-diameter steel conduit leading from the vault to an outlet structure within the lower reservoir.

No new roads would be constructed to build the project. Access to the upper and lower reservoir sites would be from public roads and 9.3 miles of private roads (i.e., 0.7-mile-long private road off John Day Dam Road to access the lower reservoir site and 8.6-mile-long private road off Hoctor Road to access the upper reservoir site). Portions of the private roads would be improved as necessary to accommodate construction vehicles. A 30-foot-wide by 26-foot-high (minimum) high main access tunnel would be used as the primary access to the underground powerhouse and transformer caverns. A 30-foot-wide by 26-foot-high (minimum) tunnel would also be constructed to carry the high-voltage transmission line from the underground transformer gallery to the tunnel portal and would be used for secondary access to the powerhouse and transformer cavern during construction and for emergency egress and access during normal operation.

Power would be sent from the generators to an underground transformer cavern adjacent to the powerhouse that steps up generator voltage from 18 kilovolts (kV) to 115 kV. From there, power would be transmitted via an underground transmission line through the combined access/transmission tunnel to where the line emerges and becomes an overhead transmission line near the west side of the lower reservoir and extends to an outdoor substation/switchyard where the voltage would be stepped up to 500 kV. From the substation, power would be transmitted through a 3.13-mile-long, 500-kV overhead transmission line routed across the Columbia River to BPA's existing John Day Substation.

To construct the lower reservoir, FFP would need to remove and dispose of the contents of the West Surface Impoundment (WSI), a waste disposal site, and decommission and replace 15 groundwater monitoring wells associated with the rehabilitation of the closed Columbia Gorge Aluminum (CGA) smelter. The contents of the WSI were determined not to be hazardous or dangerous and the WSI site was closed and capped in September 2004 through the Resource

[7] All elevations in this document are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).

Conservation and Recovery Act (RCRA) clean-up process for the smelter being overseen by Washington Department of Ecology (Washington DOE).

Proposed Operation

The project would use off-peak energy (i.e., energy available during periods of low electrical demand) to pump water from the lower reservoir to the upper reservoir and generate energy by passing the water from the upper to the lower reservoir through generating units during periods of high electrical demand. Generation timing would be based on on-peak/off-peak power considerations, the need to augment the production of renewable wind and solar power generation, or to provide ancillary power services.[8]

The exact daily operating cycle of pumping and generating would be dictated by the power market but the project would typically generate 8 hours a day, 7 days a week (with potential to generate up to a maximum of 12 hours of generation per day if needed), and then pumping water back up to the upper reservoir the remaining 12-16 hours each day. The project would generate up to 3,561,000 megawatt-hours (MWh) of electricity annually. The energy produced would be delivered to the wholesale market to be purchased by utilities in the Pacific Northwest and California to help satisfy periods of peak demand and provide grid flexibility.

Proposed Environmental Measures

FFP proposes the following environmental measures to mitigate or protect environmental resources:

Geology and Soils

- Develop a soil erosion control plan that includes best management practices (BMPs) for controlling wind and water erosion on project land.

- Develop a vibration monitoring plan to monitor for the effects of drilling the tunnels and powerhouse cavern during project construction on the foundations and underground utilities of nearby wind turbines.

- Implement a West Surface Impoundment Plan that includes methods and procedures for excavating and disposing of contaminated soils and liner materials during construction of the lower reservoir.

[8] Ancillary power services help balance the transmission system as electricity is moved from generating sources to ultimate consumers and are necessary for proper grid operation. Ancillary services include: load following, reactive power-voltage regulation, system protective services, loss compensation service, system control, load dispatch services, and energy imbalance services.

Aquatic Resources

- Implement a Monitoring Well Plan that includes decommissioning 15 existing groundwater monitoring wells that would be displaced to construct the lower reservoir and install new groundwater monitoring wells at locations selected in collaboration with Washington DOE.

- Implement a Spill Prevention, Control, and Countermeasure Plan that includes protocols for handling and containing hazardous materials during project construction, operation, and maintenance.

- Implement a Dewatering Plan that includes procedures for sampling and managing groundwater encountered while constructing the tunnels, powerhouse cavern, and lower reservoir.

- Implement a Stormwater Pollution and Prevention Plan that includes BMPs for managing stormwater to prevent contamination of surface waters from construction, operation, and maintenance activities.

- Implement a Reservoir Water Quality Monitoring Plan that include procedures for annually monitoring and reporting on water quality in the project reservoirs (i.e., dissolved solids, nutrients, and heavy metals) during project operation to determine the need for protection measures.

Terrestrial Resources

- Implement a Vegetation Management and Monitoring Plan that includes noxious weed management, surveys and protection of special status plants, and revegetation of disturbed areas with native species.

- Implement a Wetland Mitigation and Planting Plan[9] that includes: (1) evaluating the viability of establishing and rehabilitating a new stream course on-site at a 1:1.1 ratio to mitigate for permanent impacts to the streams labeled S1, S7, and S8; (2) using BMPs to control erosion; (3) revegetating disturbed areas with a native seed mix; (4) using appropriate construction management to minimize the spread of invasive weeds; and (5) monitoring revegetated areas for a minimum of 10 years until specified performance standards are achieved.

- Implement a Wildlife Management Plan that includes: (1) 2-years of pre-construction surveys to document bald eagle, golden eagle, and prairie falcon nesting and bald eagle roosting sites and to develop appropriate spatial and temporal restrictions on construction activities; (2) a training program to inform employees of sensitive biological resources; (3) procedures to limit the construction zone to avoid sensitive areas; (4) a construction monitor; (5) limiting construction activities to the hours of 8:00 a.m. to 6:00 p.m. to avoid disrupting

[9] FFP entitled this plan Mitigation and Planting Plan. However, we have chosen to call this plan a Wetland Mitigation and Planting Plan to clarify the primary focus of the plan is on wetlands.

crepuscular and nocturnal wildlife; and (6) project vehicle speed limits onsite to reduce wildlife collisions.

- To mitigate for the permanent loss of wildlife habitat, work with U.S. Fish and Wildlife Service (FWS) and Washington Department of Fish and Wildlife (Washington DFW) to select and purchase 277 acres of off-site land and manage the land for golden eagle nesting and foraging habitat.

- To deter wildlife from using the project reservoirs, FFP proposes, as part of its Wildlife Management Plan, to: (1) install a chain link fence that is at least 8 feet high around the reservoirs; (2) mark all fences with vinyl strips and/or reflective tape to reduce avian collision risks; (3) prevent the establishment of vegetation around the reservoirs; (4) cover the reservoir surfaces with floating plastic shade balls to reduce the open-water habitat that could attract waterfowl, water birds, and other raptor prey species; (5) monitor for and remove carcasses of livestock and other animals from the project area that may attract scavenging wildlife, foraging eagles, or other raptors; (6) develop a monitoring program to identify bird and mammal usage of the reservoirs and measure the effectiveness of wildlife deterrents in using the reservoirs; and (7) develop a reporting system to document wildlife mortalities, injuries, nuisance activity, and other interactions.

- To minimize avian electrocution and collision hazards with the project transmission line, FFP proposes to construct the transmission line on existing poles and ensure there is 40 inches or more of vertical clearance and 60 inches or more of horizontal clearance between energized conductors or energized conductors and grounded hardware.

Recreation and Land Use

- Develop a fencing and/or public safety plan to exclude the public from hazardous areas during construction and operation.

- Develop a visual and recreation resources management plan that includes installing an interpretive sign at a location that provides views of the project and is accessible to persons with disabilities. The signage would include a map of the project and information on pumped storage. The plan would also include a provision to coordinate construction schedules and any associated road closures or delays with Washington Department of Transportation (Washington DOT) and Klickitat County to prevent interruption to recreational traffic.

Cultural Resources

- Implement a Historic Properties Management Plan (HPMP) to mitigate unavoidable adverse impacts to historic properties.

Visual Resources

- Include in the visual and recreation resources management plan provisions to: (1) use "engineering controls" during the design process, where practicable, and select natural paint colors and dulling reflective surfaces that cannot be painted to reduce the contrasts of the

project structures with the landscape; (2) minimize footprints of aboveground features to the extent reasonably practicable; (3) ensure facilities are free of debris and store unused or damaged equipment offsite so it is not visible; (4) plant native vegetation and/or trees to break up the lines of roads and facilities and soften the visual effect on the landscape; and (5) use directional, fully shielded, low pressure sodium or light emitting diode (LED) lighting to prevent casting light in surrounding areas at night and use operational devices that allow surface night-lighting in the central project area to be turned on only as needed for safety.

Traffic Management

- Develop a traffic management plan with provisions for traffic control measures (e.g., signage, flaggers at key intersections, reduced speed limits or other speed control devices, controlled or limited access routes) and protocols for coordinating construction schedules, any temporary road or lane closures, and any traffic control measures identified in consultation with Washington DOT and Klickitat County to minimize disruption of traffic on public roads during project construction.

Public Involvement

Before filing its license application, FFP conducted pre-filing consultation under the traditional licensing process. The intent of the Commission's pre-filing process is to initiate public involvement early in the project planning process and encourage citizens, governmental entities, tribes, and other interested parties to identify and resolve issues prior to an application being formally filed with the Commission. After the application was filed, we conducted scoping to determine what issues and alternatives should be addressed. We distributed an initial scoping document to interested parties on October 29, 2020. Due to concerns for large gatherings related to COVID-19 at the time, scoping meetings were not held, but written comments were solicited. On March 24, 2022, we requested conditions and recommendations in response to a notice that the application was ready for environmental analysis.

Alternatives Considered

This draft environmental impact statement (EIS) considers the following alternatives: (1) FFP's proposal, as outlined above; (2) no action, meaning license denial; and (3) a staff alternative. Under the staff alternative, the project would be constructed and operated as proposed by FFP and described above, with some modifications or additions as described below.

Terrestrial Resources

- Modify FFP's proposed Vegetation Management Plan to include: (1) pre-construction surveys for both federal and state listed plants during the spring and early summer to improve the chances of detecting and protecting rare species; (2) shrubs and species of traditional cultural importance if they are available in the revegetation seed mix to offset the loss of culturally important plants and better achieve the revegetation goals; (3) an integrated pest management approach to controlling noxious weeds; and (4) protocols for preventing and controlling wildfires during project construction and operation.

- Modify the proposed Wildlife Management Plan to include: (1) surveys for peregrine falcons (in addition to other raptor species already identified in the plan) throughout the 5-year construction period; (2) surveys for Dalles sideband snail, monarch butterfly, and juniper hairstreak butterfly just prior to construction in areas where land disturbing activities would occur; (3) a management plan for the golden eagle mitigation lands; and (4) a detailed wildlife deterrent management plan for the project reservoirs that includes monitoring methods, metrics for evaluating the effectiveness of the deterrents in reducing the attraction of the project reservoirs to birds, bats, and other wildlife, and criteria for deciding whether additional deterrents or modifications to the project are needed.

- Develop an avian protection plan for the project transmission line that includes FFP's proposed protection measures but also includes procedures for monitoring bird fatalities and addressing problem poles and updating the plan as needed in consultation with FWS, Washington DFW, and Oregon Department of Fish and Wildlife (Oregon DFW).

Recreation Resources

- Include a provision in the visual and recreation resources management plan to coordinate construction schedules and any associated road closures or delays on John Day Dam Road with Corps personnel at John Day Dam, the Bureau of Indian Affairs, and tribal governments through the Columbia Inter Tribal Fish Commission, in addition to Klickitat County and Washington DOT.

Cultural Resources

- Revise the HPMP to include specific treatment measures for all affected archeological sites and traditional cultural properties (TCPs). The treatment should include research design and site-specific data recovery plans, including analysis, recordation, and curation, and construction site monitoring.

Environmental Impacts and Measures of the Staff Alternative

The primary issues associated with constructing and operating the project are: (1) soil erosion and fugitive dust during construction; (2) the effects of project construction on surface and ground water quality; (3) the effects of water withdrawal for the initial fill and make-up water on the downstream salmon migration; (4) the potential entrainment of salmon smolts when filling the reservoirs; (5) increased concentrations of dissolved solids, nutrients, and heavy metals in the reservoirs over time; (6) the loss of 193.6 acres of and temporary disturbance of 54.3 acres of wildlife habitat; (7) the increased risk of bird and bat mortality from wind turbine interactions caused by their attraction to the project reservoirs; (8) unavoidable adverse effects on five individual archaeological resources, the larger Columbia Hills Archaeological District, and three TCPs (*Pushpum*, *Nch'ima,* and *T'at'alíyapa*), (9) the reduction in access to usual and accustomed plant gathering sites associated with *Pushpum*, and (10) changes in the aesthetic character of the landscape, particularly as it relates to Tribal cultural practices.

The environmental effects under the staff alternative are described below.

Geology and Soils

Ground-disturbing activities during the construction of the upper and lower reservoirs, substation, and transmission line would cause soil erosion. Developing a site-specific comprehensive soil erosion control plan would control erosion and limit adverse effects on fish and wildlife resources by limiting the amount of disturbed ground to the extent possible and preventing sediment and dust transport.

The WSI contaminate site contains approximately 89,000 cubic yards of sludge primarily composed of alumina, dust, and particulates from wastewater and residual waste generated by plant emission control systems at the CGA smelter. The contents of the WSI were determined not to be hazardous or dangerous. FFP's proposed West Surface Impoundment Plan and Monitoring Well Plan follows accepted practices for removing and disposing of non-hazardous materials and closing and replacing monitoring wells. Implementing these plans would ensure the proper disposal of wastes. FFP's proposed coordination efforts would ensure that site construction and eventual operation do not interfere with remaining site remediation efforts overseen by Washington DOE.

Aquatic Resources

As water is exchanged between the reservoirs during project operation, dissolved solids, nutrients, and heavy metals could become concentrated in the reservoirs. FFP's proposed adaptive water quality monitoring and management plan would ensure that any deterioration in water quality in the reservoirs is detected and measures are identified to protect wildlife that may incidentally encounter project waters. Sealing and lining the reservoirs as proposed by FFP would prevent seepage into the groundwater that may adversely affect groundwater quality.

Terrestrial Resources

Vegetation Mitigation

Constructing the project would result in the permanent loss of 193.6 acres of vegetation and the disturbance of an additional 54.3 acres and could lead to the spread of various weed species. Most of the land where the lower reservoir would be constructed has been previously developed and disturbed and the area where the upper reservoir would be constructed has been developed for wind farms and is used for grazing. Some land that would be affected contains habitat for state and federal listed plants and plants culturally important to the Yakama. Implementing FFP's proposed revegetation plan with staff's modifications would ensure that disturbed areas are quickly revegetated using native species, including species that are important to tribal practices like smooth desert parsley. It would also include monitoring for both state and federal listed plants and taking appropriate steps to protect these plants if found.

Wildlife Habitat Mitigation

As noted above, project construction would remove 193.6 acres of wildlife habitat and wildlife would also be displaced from the construction area during the 5-year construction period. Following construction, wildlife tolerant of human activities are expected to return and continue to use the surrounding habitats. Implementing FFP's proposed Wildlife Management

Plan with staff's recommendations would minimize these effects by (1) identifying raptors nesting and roosting near construction sites and applying construction timing and spatial limits to prevent disturbance and nest abandonment (e.g., avoiding blasting and use of a helicopter within 0.25 to 1 mile of active raptor nest); (2) taking appropriate steps (e.g., marking plants, relocation, fencing) to minimize effects on Dalles sideband snail, monarch butterfly, and juniper hairstreak butterfly, if present; (3) limiting construction activities to the hours of 8:00 a.m. to 6:00 p.m. to avoid disturbing crepuscular and nocturnal wildlife and implementing project vehicle speed limits while on the project site to reduce the potential for wildlife collisions; and (4) acquiring and managing 177 acres of lands to mitigate the permanent loss of golden eagle nesting and foraging habitat.

The upper and lower reservoir would introduce a new water source in an arid environment that will likely attract waterfowl, waterbirds, bats, and other wildlife. For birds and bats, that attraction could lead to adverse interactions with nearby wind turbines. Installing fencing, preventing the establishment of vegetation along the reservoir, removing animal carcasses that might be scavenged by wildlife, and installing shade balls as proposed in FFP's Wildlife Management Plan should prevent wildlife from accessing the reservoirs and reduce their attraction to wildlife. A detailed monitoring program that includes methods for documenting bird and bat use before and after constructing and filling the reservoirs, metrics for evaluating the effectiveness of the deterrents, and criteria for deciding whether additional deterrents are warranted would ensure appropriate protections are in place for sensitive wildlife like golden eagles and bats.

Threatened and Endangered Species

Aquatic Species

Federally listed aquatic species that occur in the Columbia River near the project site include: endangered Upper Columbia River spring-run Chinook salmon evolutionary significant unit (ESU); endangered Snake River sockeye salmon ESU; threatened Lower Columbia River, Snake River fall-run, and Snake River spring/summer-run Chinook salmon ESUs; threatened bull trout/Dolly Varden; threatened Columbia River chum salmon ESU; threatened Lower Columbia River coho salmon ESU; and the threatened Lower, Middle, and Upper Columbia and Snake River steelhead distinct population segments (DPS). All the above listed species except for the Lower Columbia River Chinook salmon and the Lower Columbia River steelhead could use the Columbia River in the vicinity of the proposed project as a migration route both as adults during their spawning run and as juveniles returning to the ocean. The Columbia River adjacent to the project is considered critical habitat for each of the above federally listed salmon and steelhead. There are also four salmon ESUs with designated Essential Fish Habitat (EFH) within the project area: (1) Upper Columbia summer/fall Chinook salmon, (2) Middle Columbia River spring Chinook salmon, (3) Okanogan River sockeye salmon, and (4) Lake Wenatchee sockeye salmon.

Construction activities associated with the proposed lower reservoir and the associated cleanup action related to the WSI of the smelter should have minimal effect on water quality in the Columbia River because all the site contents would be removed and disposed of off-site and FFP's proposed erosion control plan and dewatering plan would prevent any sediment and contaminated groundwater from reaching the Columbia River. Water purchased from Klickitat

PUD would add to ongoing losses occurring from irrigation withdrawals and other activities in the basin; however, the amount purchased to initially fill the reservoirs and for annual make-up water would be relatively small, temporary withdrawals that are not expected to impede ESA-listed salmon smolt migrations to an appreciable degree. If fry and juvenile anadromous fish enter Klickitat PUD's intake pool where Klickitat PUD would withdraw water to deliver to the project, it is unlikely that they would become entrained into the project's reservoirs because fry would have to pass through about 30 feet of gravel in Klickitat PUD's infiltration gallery and miles of Klickitat PUD's conduit to enter the project water line. We conclude that licensing the proposed project may affect, but is not likely to adversely affect the above listed salmon and steelhead and bull trout, and these species' critical habitat. We also conclude that licensing the proposed project would not be expected to adversely affect Chinook or sockeye salmon EFH.

Terrestrial Species

According to FWS's Information for Planning and Consultation (IPaC) database, the following species have the potential to occur at the project: the endangered gray wolf, the threatened yellow-billed cuckoo, the proposed threatened wolverine, and the candidate monarch butterfly. There are no designated critical habitats for these species at and adjacent to the project.

We conclude that licensing the project would not affect any of the above species because (1) the gray wolf is unlikely to occur in or use the habitats surrounding the project, and (2) the project site does not include habitat to support the cuckoo or wolverine. It is unknown whether the project site is used by the monarch butterfly or includes milkweed that might provide suitable habitat for the butterfly. However, including the butterfly and milkweed in FFP's pre-construction surveys will allow FFP to take steps to protect the butterfly's habitat if it occurs in the area to be disturbed, such as fencing off occupied areas or including milkweed in the revegetation seed mix.

Cultural Resources

Project construction would adversely affect five individual archaeological resources, the larger Columbia Hills Archaeological District, and three TCPs (*Pushpum*,[10] *Nch'ima*,[11] and *T'at'ałíyapa*[12]). The TCPs contain individually recorded pre-contact archaeological sites and natural landscape features that ethnographically represent various traditional functions that were prominent in the oral histories of the Confederated Tribes and Bands of the Yakama Indian

[10] *Pushpum* is also referred to as *Put-a-lish* by the Rock Creek Band of the Yakama Nation. It consists of an area that extends along most of the Columbia Hills overlooking the Columbia River. *Pushpum* is also important to the Umatilla Tribes.

[11] *Nch'ima* is an area identified by the Yakama Nation that includes a large fishing area at the present-day location of John Day Dam, most of which included a large island that is now covered by John Day Dam and reservoir.

[12] *T'at'ałíyapa* is a large area identified by the Umatilla tribes that encompasses the rock outcroppings, fishing sites, and both shorelines of the Columbia River alongside *Pushpum.* At the project site, it overlaps with the TCP identified by the Yakama as *Nch'ima.*

Nation (Yakama), Confederated Tribes of the Umatilla Indian Reservation (Umatilla), and Nez Perce Tribe. All project land within the identified TCPs is privately owned. The five pre-contact archaeological sites are considered eligible for the National Register of Historic Places (National Register) and are contributing elements to the TCPs and to the Columbia Hills Archaeological District. All five sites would be removed to construct the upper and lower reservoirs. Project construction activities would also result in permanent indirect visual effects by altering the viewshed to or from a resource, changing its setting and feeling. The addition of the reservoirs, substation, and overhead transmission line would add to the industrial effects created by the numerous wind turbines along the Columbia Ridge, John Day Dam, existing transmission lines and substation, and the closed smelter. Such changes to the natural landscape could further alter or degrade Tribal spiritual and teaching practices should the tribes be able to access non-project lands associated with the TCPs.

The John Day Lock and Dam Historic District is not located within the project Area of Potential Effects (APE), but parts of the proposed substation and transmission line would be visible from the district. Additionally, FFP proposes to co-locate a 500-kV transmission line within the existing BPA transmission line ROW for the Rock Creek–John Day No. 1 transmission line and then interconnect to BPA's John Day Substation. Constructing the transmission line would not result in direct or indirect effects to the John Day Lock and Dam Historic District, the John Day Substation, or the Rock Creek–John Day No. 1 transmission line because construction of proposed facilities would not significantly alter the physical character of either the substation or transmission line and direct alterations to the substation (via a tap connection) would be consistent with the current use of the substation.

The proposed HPMP does not identify the specific measures that would be implemented to mitigate the adverse project effects on cultural resources that are valued by the Yakama, Umatilla, and Nez Perce. Instead, it includes general measures that would be implemented during operation to manage cultural sites, including procedures for addressing newly discovered sites. FFP defers to post-licensing the selection of the final mitigation measures and offers some conceptual measures that are intended to facilitate subsequent consultations with the tribes. Because site development would result in the complete removal of the five archeological sites, Commission staff recommend FFP provide recovery, recordation, and curation of the sites to mitigate the loss. However, the Yakama do not believe any form of mitigation is acceptable because the loss of the archaeological sites and adverse effects to the TCPs are irreplaceable in their view.

To fulfill its section 106 responsibilities, Commission staff intend to execute a Programmatic Agreement (PA) with the Washington State Historic Preservation Officer (SHPO) and the Advisory Council for the protection of historic properties that would be affected by project construction and operation. The terms of the PA would require FFP to revise the HPMP to include specific treatment measures for the affected archaeological sites and TCPs and a specific plan for monitoring during construction. The revised HPMP would be developed in consultation with the Washington SHPO, the Corps, and participating Tribes.

Access to Usual and Accustomed Gathering Sites

Project construction would permanently remove 193.6 acres of land and disturb and additional 54.3 acres of land, some of which support plants that are gathered by Yakama,

Umatilla, and Nez Perce tribal members for medical and other purposes. In addition, access to traditional gathering areas for medicinal and traditional plants and foods would be restricted during construction and permanently lost in the reservoir areas. These lands are part of the *Pushpum*, *Nch'ima* and *T'at'ałíyapa* TCPs. Taking steps to protect these culturally important plants where possible, including them in the revegetation mix, and allowing the tribes access to gather the plants on project lands where it is safe to do so would help offset some of the loss. However, as we understand it, access to these lands for traditional gathering and other purposes has been through the permission of adjacent landowners because all the land is privately held, gated, and not accessible to the public. The adjoining land would not have a project-related purpose and therefore would remain non-project land to which the Commission would not have the authority to grant access. Therefore, access to the non-project land within the TCPs for plant gathering and other purposes would not change in that the Tribes would continue to need permission from the adjoining landowners to access the land.

Visual Resources

Project construction and operation would result in both temporary and permanent changes to the viewshed. Temporary changes would occur during the 5 years of project construction. Once constructed, the reservoirs, 230-kV transmission line, and substation would be visible from certain viewpoints, with the most prominent features being the upper and lower reservoirs because of their size.

FFP's proposes several measures to reduce the visual contrast of the project facilities with the surrounding landscape, including minimizing the footprint of aboveground features to the furthest extent possible; using natural paint colors and surfacing materials that match the surrounding landscape and dull reflective surfaces that cannot be painted; planting native vegetation and/or trees to break up the lines of roads and facilities and soften the visual effect on the landscape; and designing facility lighting to prevent casting of light into adjacent areas to minimize light pollution to the extent possible. These measures would mitigate these effects to the extent practicable, but the project reservoirs would still be visible from certain distant viewpoints.

The exception are views from the TCPs, particularly *Pushpum*. *Pushpum* has significant meaning and spiritual purposes for the Yakama and Umatilla Tribes. The addition of the upper and lower reservoirs would permanently alter the views of the natural landscape from *Pushpum*, adding to the adverse visual effects created by the existing built environment (wind turbines, John Day Dam, and the CGA Smelter). Changes to the natural landscape could interrupt Tribal cultural practices because such changes can alter or degrade teaching, spiritual and ceremonial aspects of the Tribes' use of the lands.

Conclusions

In Appendix E of the EIS, we estimate the likely cost of alternative power for the alternatives identified above. Our analysis shows that under FFP's proposal, the project would have a total installed capacity of 1,200 MW and an average annual generation of 3,561,000 MWh. The alternative source of power's current cost to produce the same amount of energy and provide the same capacity would be $647,033,700. The total annual project cost would be $553,693,655. Subtracting the total annual project cost from the alternative source of power's

current cost, the project's cost to produce power and capacity would be $93,340,045 less than the alternative source of power's cost. Under the staff-recommended alternative, the project would have the same power and capacity as proposed by FFP, but the total annual project cost would be $553,760,018. Under the staff alternative, the project's cost to produce power and capacity would be $93,273,682 less than the alternative source of power's cost.

We chose the staff alternative as the preferred alternative because: (1) the project would provide a dependable source of electrical energy for the region (3,561,000 MWh annually during on peak periods); and (2) the recommended environmental measures proposed by FFP, as modified by staff, would adequately protect environmental resources affected by the project. The overall benefits of the staff alternative would be worth the cost of the proposed and recommended environmental measures.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

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

Goldendale Energy Storage Hydroelectric Project
FERC Project No. 14861-002—Washington

1.0 INTRODUCTION

1.1 APPLICATION

On June 23, 2020, FFP Project 101, LLC (FFP) filed an application to construct and operate its proposed 1,200-megawatt (MW) Goldendale Energy Storage Hydroelectric Project (FERC No. 14861-002) (Goldendale Project or project) (figure 1.1-1).[13] The closed-loop pumped storage project would be located about 8 miles southeast of the City of Goldendale, Washington, on the north side of the Columbia River at River Mile 215.6 in Klickitat County. The project would require constructing an upper and lower reservoir, an underground powerhouse, underground substation/switchyard, an underground water conveyance tunnel, a transmission line, and appurtenant facilities. The project would occupy 18.1 acres of federal lands owned by the U.S. Army Corps of Engineers (Corps) and administered by the Bonneville Power Administration (BPA). The remaining 663.5 acres that would be enclosed within the project boundary are primarily owned by NSC Smelter, LLC (529.6 acres) but also include 23.6 acres owned by the Washington Department of Transportation (Washington DOT), 1.8 acres owned by the Washington Department of Natural Resources, 1.9 acres owned by BNSF Railway Company, 92.3 acres owned by other private entities, and 14.3 acres of the Columbia River.[14] Portions of the project's proposed infrastructure would be located on the site of the former Columbia Gorge Aluminum smelter, a Resource Conservation and Recovery Act (RCRA) contaminated site that is the subject of ongoing investigation and clean-up by the potentially liable parties (i.e., NSC Smelter, LLC and Lockheed Martin Corporation) overseen by Washington Department of Ecology (Washington DOE). Specifically, the new lower reservoir and new water fill pipeline would be located within the footprint of Solid Waste Management

[13] All figures and tables for this EIS are provided in appendices A and B.

[14] Most of the lands not owned by NSC Smelter, LLC that would be enclosed within the project boundary are within an existing transmission right-of-way administered by BPA.

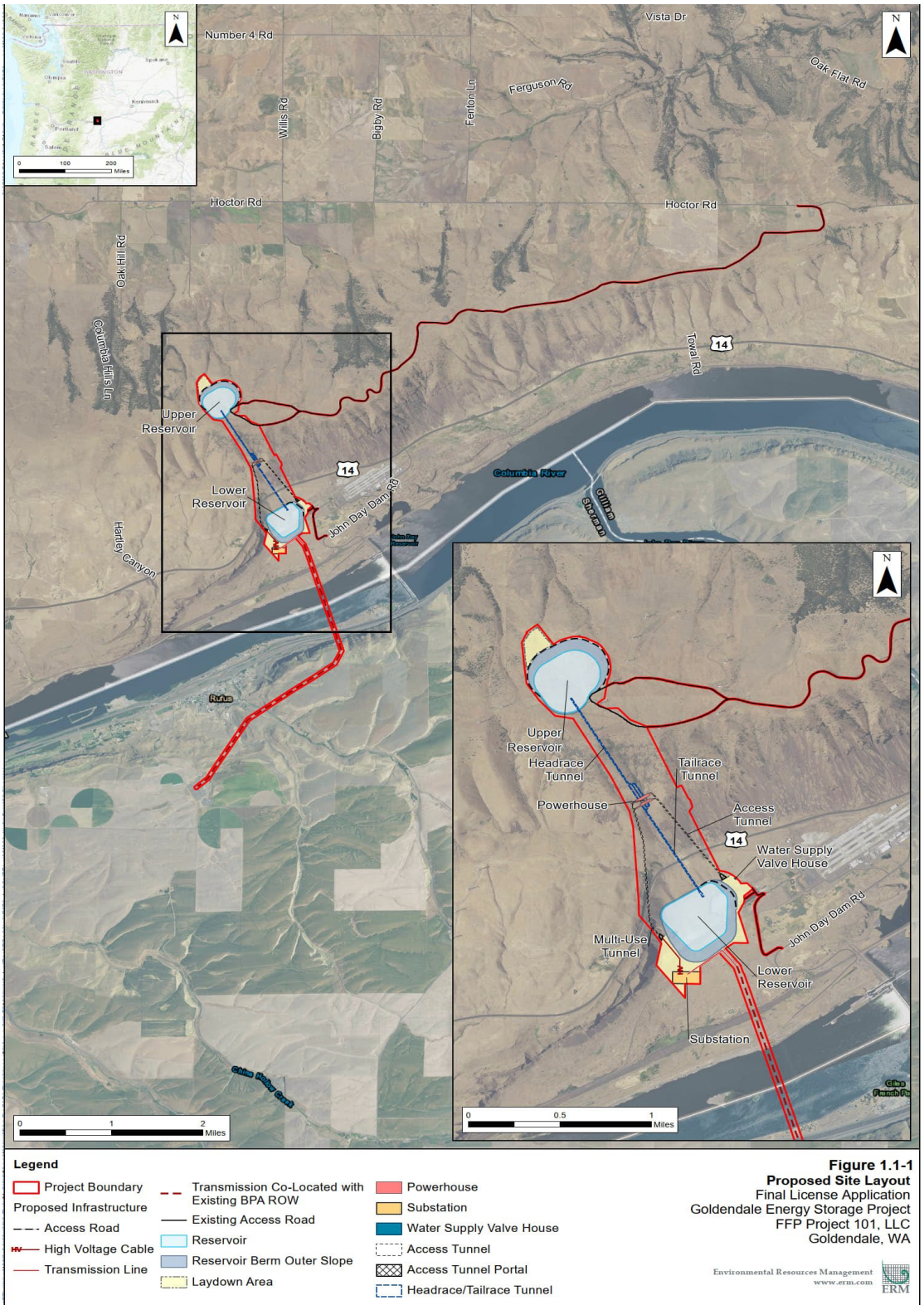

Figure 1.1-1. Location of Goldendale Energy Storage Hydroelectric Project (Source: FFP, as modified by staff).

Unit (SWMU) number 4 also known as the West Surface Impoundment (WSI).[15] In 2004, the WSI was closed under RCRA and in 2005 Washington DOE accepted certification for the closure of the site. The site contains approximately 89,000 cubic yards of sludge primarily composed of alumina, dust, and particulates from wastewater and residual waste generated by plant emission control systems.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the proposed project is to provide a new source of hydroelectric power primarily during on peak periods and provide ancillary services to the electrical grid. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a license to FFP 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 would 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; (4) the protection of historic properties, and (5) the preservation of other aspects of environmental quality.

Issuing an original license for the project would allow FFP to construct the project and generate electricity for the term of the license, making electrical power from a renewable resource available to the electric grid during high demand periods.

This draft environmental impact statement (draft EIS) has been prepared in compliance with the National Environmental Policy Act (NEPA)[16] of 1969 to assess the effects associated with construction, operation, and maintenance of the project and alternatives to the proposed project. It also includes recommendations to the Commission on whether to issue a license, and if so, includes the recommended terms and conditions to become a part of any license issued.

In this draft EIS, we assess the environmental and economic effects of constructing, operating, and maintaining the project: (1) as proposed by FFP (proposed action), (2) the proposed action with additional or modified measures (staff alternative), and (3) the staff alternative with the addition of mandatory conditions. We also consider the effects of the no-

[15] When the aluminum smelter was operating, the WSI was used to concentrate emission control wastewater through evaporation and for storage and disposal of air emission control sludge.

[16] The Council on Environmental Quality (CEQ) issued a final rule on April 20, 2022, revising the regulations under 40 C.F.R. pts. 1502, 1507, and 1508 that federal agencies use to implement NEPA (see *National Environmental Policy Act Implementing Regulations Revisions,* 87 FR 23453). The final rule became effective May 20, 2022. Accordingly, Commission staff prepared this EIS in accordance with CEQ's new regulations.

action alternative, which is denying the license. The primary issues that are assessed include project-related construction, operation, and maintenance effects on geology and soils, aquatic and terrestrial resources, threatened and endangered species, recreation, and cultural resources.

1.2.2 Need for Power

The project would provide hydroelectric generation to meet part of Washington's power requirements, resource diversity, and capacity needs. The project intends to use surplus renewable power to pump water from the lower-elevation reservoir to the higher reservoir during low demand periods and generate power for up to 10 hours when grid operators need more energy to meet demand or to balance sudden drop-offs in solar or wind production. The project would have an installed capacity of 1,200 megawatts (MW) and would be capable of generating 3,561,000 megawatt-hours (MWh) of electricity annually.

To assess the need for power, staff looks at the needs in the operating region in which the project would be located. The project would be in the Western Electricity Coordinating Council region of the North American Electric Reliability Corporation (NERC) in the Northwest Power Pool and Rocky Mountain Reserve Sharing Group assessment subregion.

NERC annually forecasts electricity supply and demand nationally and regionally for a 10-year period. According to NERC's 2021 long-term reliability assessment (NERC, 2021), the total internal demand in the Northwest Power Pool and Rocky Mountain Reserve Sharing Group assessment subregion is forecasted to increase from 70,393 MW in 2022 to 76,803 MW in 2031. During this same period, the anticipated reserve capacity margin (generating capacity in excess of demand) in the region is forecasted to decrease from 21.5% in 2022 to 16.4% by 2030, but then drop to 8.0% in 2031. The reserve is expected to be at or above the reserve margin (13.4% to 15.2%) into 2030 but would drop below the reserve margin of 13.0% in 2031. Therefore, the region is expected to have enough capacity until late in the period. The retirement of coal-fired facilities over the period results in a loss of 4,200 MW, and retirement of natural gas facilities would result in a loss of 1,300 MW for a total loss of 5,500 MW. These losses are only partially offset by increases in solar, geothermal, conventional hydro, and other capacity of 4,300 MW, resulting in a net loss of about 1,200 MW. The increase in demand and decrease in generating capacity would result in a shortfall.

Should an original license for the project not be granted, the proposed services that the project would provide to the grid, including peaking generation and black start capability, would need to be provided by other existing projects or in some other fashion by the system operator. Additionally, the State of Washington's 2021 State Energy Strategy includes a goal of transitioning to 100% clean electricity by 2045 and identifies pumped storage hydropower as having a likely role in balancing the supply and demand for electricity during this transition.[17]

[17] On May 7, 2019, Governor Jay Inslee signed into law the Clean Energy Transformation Act (SB 5116, 2019), which commits the State of Washington to an electricity supply free of greenhouse gas emissions by 2045. More information can be found online at: https://www.commerce.wa.gov/growing-the-economy/energy/2021-state-energy-strategy/.

Thus, power from the project would help meet demand for power in both the short- and long-term.

1.3 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 C.F.R., section 4.38) 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, Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

1.3.1 Scoping

Before preparing this EIS, staff conducted scoping to determine what issues and alternatives should be addressed. Scoping document (SD1) was distributed to interested agencies and others on October 29, 2020, and noticed in the Federal Register (FR) on November 4, 2020 (80 FR 70135).[18] The following entities provided written comments: Washington DOE on November 20 and December 29, 2020; Washington Department of Fish and Wildlife (Washington DFW) on December 22, 2020; collectively, Columbia Riverkeeper, Friends of the White Salmon River, and Washington Chapter of the Sierra Club on December 28, 2020; American Rivers on December 28, 2020; the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation) on December 28, 2020; the Confederated Tribes of the Umatilla Indian Reservation (Umatilla Tribes) on December 29, 2020; and the Columbia Gorge Audubon Society on February 8 and 12, 2021.

A revised scoping document (SD2), addressing these comments, was issued on March 30, 2021.

1.3.2 Interventions

On December 17, 2020, the Commission issued a notice accepting the license application. The notice set February 16, 2021, as the deadline for filing motions to intervene and protests. The notice was published in the Federal Register on December 23, 2020 (85 FR 83938). The following entities filed motions to intervene: Washington DFW on January 7, 2021; BPA on February 11, 2021; American Rivers on February 11, 2021; the National Marine Fisheries Service (NMFS) on February 11, 2021; U.S. Department of the Interior (Interior) on February 11, 2021; Washington DOE on February 12, 2021; Oregon Department of Fish and Wildlife (Oregon DFW) on February 12, 2021; Friends of the White Salmon River on February 16, 2021; Columbia Riverkeeper on February 16, 2021; Sierra Club on February 16, 2021; and Klickitat County on February 16, 2021. Turlock Irrigation District (TID) filed a motion to intervene in opposition to the project on February 16, 2021. Columbia Gorge Audubon Society

[18] Due to concerns with large gatherings related to COVID-19 at the time, we did not conduct a public scoping meeting and site visit. Instead, we solicited written comments, recommendations, and information.

filed comments protesting the project on February 8 and 12, 2021, but did not formally file a motion to intervene.

1.3.3 Comments on the Application

On March 24, 2022, the Commission issued a notice stating that the application was ready for environmental analysis and soliciting comments, recommendations, terms and conditions, and prescriptions (REA Notice). The notice was published in the Federal Register on March 30, 2022 (87 FR 18363). The following entities filed comments and recommendations: Washington DFW on May 18, 2022; Interior on May 23, 2022; NMFS on May 23, 2022; American Rivers on May 23, 2022; TID on May 23, 2022; Yakama Nation on May 23, 2022; Klickitat County Public Works on May 24, 2022; collectively, Columbia Riverkeeper, Sierra Club, and Washington Environmental Council (hereafter referred to as the Environmental Groups) on May 24, 2022; the U.S. Environmental Protection Agency (EPA) on May 31, 2022; and NSC Smelter, LLC on July 7, 2022.

FFP filed reply comments on July 7, 2022.

1.4 TRIBAL CONSULTATION

On March 1, 2019, Commission staff sent a letter to the Yakama Nation, the Umatilla Tribes, and the Confederated Tribes of the Warm Springs Reservation of Oregon (Warm Springs Tribes) inviting them to participate in the licensing process. On April 1, 2019, staff followed up with the Yakama Nation by calling and leaving a message with the Chairman's secretary who instructed staff to also send a follow-up email to the Chairman with a link to the March 1, 2019 letter. Staff sent the requested email to the Chairman of the Yakama Nation the same day and sent another follow-up email on June 4, 2019. Staff also called and left voice messages with the Umatilla Tribes on April 1 and May 7, 2019, and with the Warm Springs Tribes on April 1 and June 4, 2019. The Yakama Nation, the Umatilla Tribes, and the Warm Springs Tribes did not respond to Commission staff's inquiries. On September 22, 2020, Commission staff sent a letter to the Nez Perce Tribe also inviting them to participate in the licensing process after staff became aware of their interest in the project. Commission staff met with the Nez Perce Tribe on September 30, 2020.

On December 28, 2020, and December 29, 2020, respectively, the Yakama Nation and the Umatilla Tribes filed scoping comments. On March 30, 2021, Commission staff issued a second scoping document (SD2) that responded to comments received from the Tribes and other stakeholders.

On September 16, 2021, the Yakama Nation filed a letter objecting to the Commission's designation of FFP as its non-federal representative for the proposed project under section 106 of the NHPA. On September 23, 2021, Commission staff again invited the Yakama Nation to meet with Commission staff to discuss the Tribe's concern and participation in the licensing process. A notice of the meeting was issued on October 21, 2021, and a meeting with the Tribe was held on November 10, 2021. On November 19, 2021, Commission staff filed a summary of the meeting and sent a follow-up letter to the Tribe on December 9, 2021, describing the

Commission's rules regarding off-the-record (i.e., ex parte) communications and providing specific instructions for filing confidential and sensitive cultural resources information.

On May 23, 2022, the Yakama Nation filed a letter requesting that the Commission suspend its March 24, 2022 REA Notice. In the letter, the Yakama Nation stated that the Commission had not given equal consideration to the preservation of other aspects of environmental quality, including cultural resources, as required by the FPA and that the Tribe was still waiting for the Commission to offer government-to-government consultation in a manner that protects the privileged and confidential cultural resources information that the Tribe wishes to provide. On June 28, 2022, Commission staff replied to the Yakama Nation's letter stating that Commission staff will not suspend the commenting procedures set forth in Commission staff's March 24, 2022 REA notice because there is no basis for delaying the evaluation of the license application. Staff stated that it would address the Tribe's concerns in the draft EIS, and to the extent possible with available information, will give equal consideration to the preservation of environmental quality, including cultural resources, in its licensing decision on whether to issue a license for the project. Staff stated that the Commission will endeavor to continue working together with the Yakama Nation on a government-to-government basis to address the effects of the proposed project on Tribal rights and resources through consultation to the extent authorized by law. Staff also offered to again meet with the Yakama Nation to discuss the Tribe's concerns. The Yakama Nation did not respond.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

The no-action alternative is license denial. Under the no-action alternative, the project would not be built, and the environmental resources in the project area would not be affected.

2.2 APPLICANT'S PROPOSAL

2.2.1 Existing Facilities to be used by the Project

The water used to fill the project reservoirs would be purchased from Klickitat Public Utility District (Klickitat PUD) and would be sourced from Klickitat PUD's intake pool which is adjacent to the Columbia River approximately two miles south and east of the proposed lower reservoir site. Klickitat PUD's intake pool is separated from the Columbia River by a 500-foot-long rock and gravel-filled embankment supporting the BNSF railway. Water from the Columbia River enters the intake pool via seepage through the embankment materials but can also enter via an existing 120-foot-long culvert running through the railway embankment. Klickitat PUD's pump station is located on the northwest corner of the intake pool (approximately 400 feet from the railway embankment and approximately 600 feet from the Columbia River). The pump station consists of an infiltration gallery in an excavated channel approximately 93 feet wide and 28 feet deep containing six vertical pumps installed in 48-inch diameter perforated casings surrounded by 2,400 cubic yards of clean gravel. Water seeps approximately 30 feet through the gravel to the pump casings where it is pumped up and conveyed to the former aluminum smelter site via an existing 2-mile-long industrial water conveyance line to a water supply vault, also owned by Klickitat PUD. Klickitat PUD's intake

pool, pump station, water conveyance line, and water supply vault are not proposed to be project facilities.

FFP would also use an existing 0.7-mile-long private road off John Day Dam Road to access the lower reservoir site and an existing 8.6-mile-long private road off Hoctor Road to access the upper reservoir site.

Additionally, two non-project distribution lines would be relocated around the south side of the lower reservoir. This would require a new approximately 5,600-foot-long alignment for both lines, the relocation of five to six wooden H-frame towers, and nine to ten single pole structures.

2.2.2 Proposed Project Facilities

The proposed Goldendale Project would consist of the following new facilities: (1) a 61-acre upper reservoir formed by a 175-foot-high, 8,000-foot-long concrete-faced rockfill embankment dam at an elevation of 2,940 feet National Geodetic Vertical Datum of 1929 (NGVD 29) with an ungated morning-glory or bellmouth-type vertical concrete intake-outlet structure; (2) an underground conveyance tunnel system connecting the upper reservoir to the underground powerhouse that consists of: a 2,200-foot-long, 29-foot-diameter concrete-lined vertical shaft; a 3,300-foot-long, 29-foot-diameter concrete-lined high-pressure tunnel; a 200-foot-long, 22-foot-diameter high-pressure manifold tunnel; and three 600-foot-long, 15-foot-diameter steel/concrete penstocks; (3) an underground powerhouse located between the upper and lower reservoir in a 450-foot-long, 80-foot-wide, 150-foot-high powerhouse cavern and containing three, 400-MW Francis-type pump-turbine units for a total installed capacity of 1,200 MW; (4) a 350-foot-long, 60-foot-wide, 55-foot-high underground transformer cavern (transformer gallery) adjacent to the powerhouse cavern containing intermediate step-up transformers that step up the generator voltage from 18 kilovolts (kV) to 115 kV; (5) an underground conveyance tunnel system connecting the underground powerhouse to the lower reservoir that consists of: three 200-foot-long, 20-foot-diameter steel-lined draft tube tunnels each with a bonneted slide gate; a 200-foot-long, 26-foot-diameter concrete-lined low pressure tunnel; and a 3,200-foot-long, 30-foot-diameter concrete-lined tailrace tunnel with vertical slide gates; (6) a 63-acre lower reservoir formed by a 205-foot-high, 6,100-foot-long concrete-faced rockfill embankment at an elevation of 580 feet (NGVD 29) with a horizontal concrete intake-outlet structure and vertical steel slide gates; (7) one 30-foot-wide by 26-foot-high (minimum) high main access tunnel for accessing the powerhouse and transformer caverns during construction and operation; (8) one 30-foot-wide by 26-foot-high (minimum) high tunnel through which the high-voltage transmission line would pass from the transformer gallery to the tunnel portal and would be used for secondary and redundant access to the powerhouse and transformer cavern during construction and for emergency egress and access during normal operations; (9) a 0.84-mile-long, 115-kV underground transmission line extending from the transformer gallery through the combined access/transmission tunnel to where it emerges aboveground near the west side of the lower reservoir and extending an additional 0.27 miles to an outdoor 800-foot by 400-foot substation/switchyard where the voltage would be stepped up to 500 kV; (10) a 3.13-mile-long, 500-kV overhead transmission line routed from the substation/switchyard south across the Columbia River and connecting to BPA's existing John

Day Substation;[19] (11) a buried 30-inch-diameter water fill line leading from a shut-off and throttling valve within a non-project water supply vault owned by Klickitat PUD to an outlet structure within the lower reservoir to convey water to fill the reservoirs; and (12) appurtenant facilities.

The roads used to access the new upper and lower reservoirs may be widened, hardened, and modified to provide access for heavy construction vehicles and transport vehicles requiring a large turning radius.

FFP would also fund BPA to modify the existing John Day Substation to interconnect the new 500-kV project transmission line to the regional grid.

2.2.3 Proposed Project Boundary

FFP's proposed project boundary would enclose all FFP's proposed project facilities described above and enclose a total of 681.6 acres consisting mostly of private land owned by NSC Smelter, LLC (529.6 acres) while also enclosing 23.6 acres owned by the Washington DOT, 18.1 acres owned by the Corps, 1.8 acres owned by the Washington Department of Natural Resources, 1.9 acres owned by BNSF Railway Company, 92.3 acres owned by other private entities, and 14.3 acres of the Columbia River.[20]

The proposed project boundary would not include Klickitat PUD's existing intake pool, pump station, or 2-mile-long industrial water conveyance line currently servicing the smelter cleanup site. One wind turbine owned and operated by TID would be located on the surface directly above the water conveyance tunnels near the proposed upper reservoir site. FFP states that because the wind turbine is unrelated to the project and vertically separated from the proposed tunnels, it should be excluded from the boundary.

2.2.4 Proposed Project Operation

2.2.4.1 Initial Reservoir Fill

The new project water fill line would connect to a new Klickitat PUD-owned flanged water supply service connection in Klickitat PUD's water supply vault located near the lower reservoir. Within the vault, and just downstream of the service connection, there would be a project shut-off and throttling valve to control the initial fill and make-up water flow rate into the lower reservoir.

The volume of water required to initially fill the project is estimated as 7,640 acre-feet. This volume equals the sum of the active storage to be used for generation (7,100 acre-feet), the

[19] FFP states that the 500-kV project transmission line would use the existing and available circuits on the existing BPA towers that cross the Columbia River rather than installing new towers.

[20] Most of the lands not owned by NSC Smelter, LLC that would be enclosed within the project boundary are within the existing transmission right-of-way administered by BPA.

combined dead storage for both reservoirs (340 acre-feet), and the volume contained within the conveyance system (200 acre-feet). It is assumed that the initial fill would be completed over a period of 6 to 12 months at an average flow rate of approximately 21 cubic feet per second (cfs) (maximum flow rate available is 35 cfs). Timing of the initial fill would depend on the timing of construction activities. Settlement and leakage monitoring equipment would be used to monitor the fill progress, and the data would be used to inform any adjustments in the filling rate.

2.2.4.2 Pumped Storage Operation

The project would operate as a closed-loop pumped storage system. At the initiation of an operating cycle at times when energy is in excess or in low demand, approximately 7,100 acre-feet of water would be pumped from the lower reservoir to the upper reservoir using three variable-speed, reversible pump-turbines located in the underground powerhouse operating in pump mode. To generate power when energy is needed, water would be released from the upper reservoir through the high-pressure penstock and passed through the three 400-MW, variable-speed, reversible pump-turbine units in the powerhouse to generate electricity. This would occur based on on-peak/off-peak power considerations, the need to augment the production of renewable wind and solar power generation, or to provide ancillary power services.[21]

The exact daily operating cycle of pumping and generating would be dictated by market demand but would be limited to a maximum of 12 hours of generation per day, and then pumping water back up to the upper reservoir the remaining 12 hours each day.[22] While this is considered the maximum, FFP states that it typically would generate 8 hours a day, seven days a week. Thus, the project would be capable of delivering up to 14,745 megawatt-hours (MWh) in a typical 24-hour generation-pumping operating cycle as shown in figure 2.2.3-1 but would likely generate 3,561,000 MWh of electricity annually under its proposed operating schedule. The energy produced would be delivered to the wholesale market to be purchased by utilities in the Pacific Northwest and California to help satisfy periods of peak demand and provide grid flexibility.

[21] Ancillary services help balance the transmission system as electricity is moved from generating sources to ultimate consumers and are necessary for proper grid operation. Ancillary services include load following, reactive power-voltage regulation, system protective services, loss compensation service, system control, load dispatch services, and energy imbalance services.

[22] FFP states in its license application that the maximum rate of flow released from the upper reservoir to the lower reservoir would be 8,280 cfs and the maximum pumping flow rate would be 6,700 cfs. However, FFP later clarified that the flow rate for generating is not continuous and would shift as the head changes so that the upper reservoir doesn't drain too quickly during each 12-hour generating period. Thus, FFP expects to be able to generate at the project for 12 hours and pump water the remaining 12 hours. *See* phone memorandum issued September 1, 2021.

2.2.4.3 Periodic Make-up Water to Restore Reservoir Volume

Based on long-term data recorded by the Goldendale, Washington, AgriMET weather station, FFP estimates there would be a loss of 390 acre-feet from the reservoirs from evaporation and 100 acre-feet from leakage through the water conveyance system. Some of the loss (130 acre-feet) would likely be made up from precipitation. The remainder (360 acre-feet) would likely need to be acquired through purchases from Klickitat PUD to refill the upper reservoir each year.

The exact schedule of the make-up water refill—whether the refill would be once per year, or over multiple, shorter withdrawals per year, along with details regarding time of year—would depend on actual site conditions.

2.2.5 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-approved plans and specifications, special license articles relating to construction, and accepted engineering practices and procedures. Operational inspections would focus on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, any license issued would require an inspection and evaluation every five years by an independent consultant and submittal of the consultant's safety report for Commission review.

2.2.6 Proposed Environmental Measures

FFP proposes the following environmental measures:[23]

Geology and Soils

- Develop a soil erosion control plan that includes best management practices for controlling wind and water erosion on project land.

- Develop a vibration monitoring plan to monitor for the effects of drilling of the tunnels and powerhouse cavern during project construction on the foundations and underground utilities of nearby wind turbines.[24]

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[23] FFP filed a water quality certification application after it filed its license application. In the water quality certification application, FFP proposes additional measures that were not included in the license application before the Commission. We have considered these measures in the EIS and include them as part of FFP's proposed action.

[24] FFP would include in the plan a provision to conduct a construction baseline survey and include contractor requirements and vibration criteria to be followed to minimize effects on existing wind farm facilities.

- Implement a West Surface Impoundment Plan filed on November 20, 2020, that includes methods and procedures for excavating and disposing of contaminated soils and liner materials associated with the WSI.[25]

Aquatic Resources

- Implement a Monitoring Well Plan filed on November 20, 2020, that includes decommissioning 15 existing groundwater monitoring wells that would be displaced to construct the lower reservoir and install new groundwater monitoring wells at locations selected in collaboration with Washington DOE.[26]

- Implement a Spill Prevention, Control, and Countermeasure Plan (Spill Prevention Plan) filed on May 24, 2022, that includes protocols for handling and containing hazardous materials during project construction, operation, and maintenance.

- Implement a Dewatering Plan filed on May 24, 2022, that includes procedures for sampling and managing groundwater encountered while constructing the tunnels, powerhouse cavern, and lower reservoir.

- Implement a Stormwater Pollution and Prevention Plan (Draft Stormwater Management Plan) filed on May 24, 2022, that includes BMPs for managing stormwater to prevent contamination of surface waters from construction, operation, and maintenance activities.

- Implement a Reservoir Water Quality Monitoring Plan (Water Quality Monitoring Plan) filed on May 24, 2022, that include procedures for annually monitoring and reporting on water quality in the project reservoirs (i.e., dissolved solids, nutrients, and heavy metals) during project operation to determine the need for protection measures.

Terrestrial Resources

- Implement a Vegetation Management and Monitoring Plan (Vegetation Management Plan) filed on June 23, 2020, that includes noxious weed management, surveys and protection of special status plants, and revegetation of disturbed areas with a native upland seed mix and monitoring for 5 years or until fully established.

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[25] The new lower reservoir and reservoir fill line would overlap a closed and capped surface impoundment known as the WSI associated with the former CGA smelter contaminated site. More details on this site can be found in section 3.3.1.1 *Geology and Soils*, *Affected Environment*.

[26] FFP has taken steps to obtain a prospective purchaser agreement from Washington DOE and the Washington State Attorney General's Office, including submitting an initial application to these entities that describes a plan of action to address the WSI and the existing monitoring wells in a manner that would not impact the ongoing investigation and cleanup of the smelter site.

- Implement a Wetland Mitigation and Planting Plan (Wetland Mitigation Plan) filed on May 24, 2022, that includes: (1) evaluating the viability of establishing and rehabilitating a new stream course on-site at 1:1.1 ratio to mitigate for permanent impacts to the ephemeral streams labeled S1, S7, and S8; (2) using BMPs to control erosion; (3) revegetating disturbed areas with a native seed mix; (4) using appropriate construction management to minimize the spread of invasive weeds; and (5) monitoring revegetated areas for a minimum of 10 years until specified performance standards are achieved.

- Implement a Wildlife Management Plan filed on June 23, 2020, that includes: (1) 2 years of pre-construction surveys to document bald eagle, golden eagle, and prairie falcon nesting and bald eagle roosting sites and to develop appropriate spatial and temporal restrictions on construction activities;[27] (2) a training program to inform employees of sensitive biological resources; (3) procedures to limit the construction zone to avoid sensitive areas; (4) a construction monitor; (5) limiting construction activities to the hours of 8:00 a.m. to 6:00 p.m. to avoid disrupting crepuscular and nocturnal wildlife; and (6) project vehicle speed limits onsite to reduce wildlife collisions.

- To mitigate for the permanent loss of wildlife habitat, work with FWS and Washington DFW to select and purchase 277 acres[28] of off-site land and manage the land for golden eagle nesting and foraging habitat.

- To deter wildlife from using the project reservoirs, implement the following measures filed as part of its Wildlife Management Plan, to: (1) install a chain link fence that is at least 8 feet high around the reservoirs; (2) mark all fences with vinyl strips and/or reflective tape to reduce avian collision risks; (3) prevent the establishment of vegetation around the reservoirs; (4) cover the reservoir surfaces with floating plastic shade balls to reduce the open-water habitat that could attract waterfowl, water birds, and other raptor prey species; (5) monitor for and remove carcasses of livestock and other animals from the project area that may attract scavenging wildlife, foraging eagles, or other raptors; (6) develop a monitoring program to identify bird and mammal usage of the reservoirs and measure the effectiveness of wildlife deterrents in using the reservoirs; and (7) develop a reporting system to document wildlife mortalities, injuries, nuisance activity, and other interactions.

- To minimize avian electrocution and collision hazards with the project transmission line, construct the transmission line on existing poles and ensure there is 40 inches or more of vertical clearance and 60 inches or more of horizontal clearance between energized conductors or energized conductors and grounded hardware.

[27] Survey methods would follow Washington DFW survey guidelines, in consultation with Washington DFW and FWS area biologists as well as guidance provided in Pagel et al. 2010 and Watson and Whalen 2004.

[28] Acreage is based on a ratio of 2:1 acre for permanent loss of habitat for the upper reservoir (92.36 acres) and a ratio of 1:1 for the loss of habitat for the lower reservoir (91.8 acres) because of its poorer habitat quality.

Recreation and Land Use

- Develop a fencing and/or public safety plan for restricting public access to hazardous areas and to protect recreationalists during construction and operation.

- Develop a visual and recreation resources management plan that includes installing an interpretive sign at a location that provides views of the project and is accessible to persons with disabilities. The signage would include a map of the project and information on pumped storage. The plan would also include a provision to coordinate construction schedules and any associated road closures or delays with Washington DOT and Klickitat County to prevent interruption to recreational traffic.

Cultural Resources

- Implement a Historic Properties Management Plan (HPMP) filed on January 25, 2022, to mitigate unavoidable adverse impacts to historic properties.

Visual Resources

- Include in the visual and recreation resources management plan provisions to (1) use "engineering controls" during the design process, where practicable, and select natural paint colors and dulling reflective surfaces that cannot be painted to reduce the contrasts of the project structures with the landscape; (2) minimize the footprints of aboveground features to the furthest extent reasonably practicable; (3) ensure facilities are free of debris and store unused or damaged equipment offsite so it is not visible; (4) plant native vegetation and/or trees to break up the lines of roads and facilities and soften the visual effect on the landscape; and (5) use directional, fully shielded, low pressure sodium lighting to prevent casting light in surrounding areas at night and use operational devices that allow surface night-lighting in the central project area to be turned on only as needed for safety.

Traffic Management

- Develop a traffic management plan containing applicable traffic control measures (e.g., signage, flaggers at key intersections, reduced speed limits or other speed control devices, controlled or limited access routes) and protocols for coordinating construction schedules, any temporary road or lane closures, and any traffic control measures with Washington DOT and Klickitat County to minimize disruption of traffic on public roads during project construction.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include FFP's measures as outlined above, with the modifications described below.

Terrestrial Resources

- Modify the Vegetation Management Plan to: (1) include surveys for federal- and state-listed plants during the spring and early summer; (2) include shrubs and species of traditional

cultural importance if they are available in the revegetation seed mix; (3) implement an integrated pest management approach to controlling noxious weeds; and (4) develop protocols for preventing and controlling wildfires during project construction and operation.

- Modify the proposed Wildlife Management Plan to include: (1) pre-construction surveys for peregrine falcons (in addition to surveying other raptor species already identified in the plan); (2) pre-construction surveys for Dalles sideband snail, monarch butterfly, and juniper hairstreak butterfly; (3) a detailed wildlife deterrent management plan for the project reservoirs that includes monitoring methods, metrics for evaluating the effectiveness of the deterrents in reducing the attraction of the project reservoirs to birds, bats, and other wildlife, and criteria for deciding whether additional deterrents or modifications to the project are needed; and (4) a management plan for the golden eagle mitigation lands that includes controlling noxious weeds, managing public access to avoid disturbing raptors, wildfire mitigation measures such as replanting of burned areas with native species, fencing to protect and improve the habitat, and development of a wildlife water guzzler if there is an identified need for a source of water.

- Develop an avian protection plan for the project transmission line that includes FFP's proposed protection measures but also includes procedures for monitoring bird fatalities and addressing problem poles and updating the plan as needed in consultation with FWS, Washington DFW, and Oregon DFW.

Recreation Resources

- Include a provision in the visual and recreation resources management plan to also coordinate construction schedules and any associated road closures or delays on John Day Dam Road with Corps personnel at John Day Dam, the Bureau of Indian Affairs (BIA), and Tribal governments through the Columbia Inter Tribal Fish Commission, in addition to Klickitat County and Washington DOT.

Cultural Resources

- Revise the January 25, 2022 HPMP to include specific treatment measures for all affected archeological sites and TCPs. The treatment should include research design and site-specific data recovery or other treatment plans, including analysis, recordation, and curation, and a specific plan for construction site monitoring. Construction monitoring should include (1) identifying the specifies areas that will be monitored during construction; (2) the location of the National Register-eligible cultural sites to be avoided and how they will be marked and avoided where possible; and (3) protocols for training construction workers on the importance of cultural sites, how to identify cultural sites, the need to avoid damage to cultural sites, and procedures to follow if previously unidentified cultural sites, including Indian graves, are encountered during construction.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The Environmental Groups recommended six alternatives to FFP's proposal that are not reasonable in this case for the reasons explained in Appendix D: (1) using Lithium Ion batteries;

(2) using stacked blocks; (3) using liquid air; (4) using underground compressed air; (5) using flow batteries; and (6) using gravity batteries.

3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) our analysis of the proposed action and other recommended environmental measures; and (3) our analysis of cumulative effects on cultural resources and raptors. Sections are organized by resource area. Under each resource area, historic and current conditions are first described. 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*.[29]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The proposed project would be primarily located in Klickitat County, Washington, within the Middle Columbia River Basin. The upper reservoir would be constructed near the headwaters of Swale Creek, which flows west to join the Klickitat River. The Klickitat River then flows south and discharges to the Columbia River roughly 35 miles downstream of the proposed project.

The lower reservoir, substation, and project transmission line would be constructed on a topographic bench about 1,500 feet from the Columbia River. The John Day Dam is located on the Columbia River immediately upstream of the project and impounds Lake Umatilla. The proposed project is adjacent to the headwaters and the proposed transmission line would cross Lake Celilo that is impounded by The Dalles Dam located approximately 24 river miles downstream of John Day Dam.

The proposed project boundary encompasses 681.6 acres of mostly private lands owned by NSC Smelter, LLC, and an existing utility right-of-way owned by BPA. The upper reservoir would be located on the Columbia Hills, a high desert plateau above the Columbia River with an elevation approximately 2,800 feet above sea level. The lower reservoir, underground powerhouse, access tunnel portal, and substation would be located on a former floodplain above the Columbia River at approximately 440 feet above sea level. The lower reservoir area would include lands previously used by the Columbia Gorge Aluminum (CGA) smelter.

The climate in the project area is characterized by hot and dry conditions in the summer (90 degrees Fahrenheit [ºF] average daytime high temperature in July) and relatively cold conditions in the winter (40ºF average daytime high temperature in December), with some moderation in temperatures due to proximity to the Columbia River. Precipitation averages

[29] Unless otherwise indicated, our information is taken from the application for license filed on June 23, 2020, and additional information filed by FFP on August 10, 2020; November 20, 2020; December 4, 2020; February 16, 2021; March 30, 2021; July 2, 2021; October 4, 2021; January 25, 2022; and May 24, 2022.

about 13 inches/year.[30] This portion of the Columbia River Basin typically experiences precipitation during the late fall, winter, and spring and is mostly in the form of rain.

3.2 CUMULATIVE EFFECTS

According to CEQ's regulations for implementing NEPA (40 C.F.R., section 1508.7),[31] a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts 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 our review of the license application and agency and public comments, we identified visual resources, cultural resources, and raptors as resources that could be cumulatively affected by the proposed project in combination with other past, present, and foreseeable future activities in the Columbia River basin near the project.

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 effect on the resources, and (2) contributing effects from other hydropower development, wind energy development, and other industry along the Columbia River. We identified the geographic scope of analysis for raptors, visual, and cultural resources as the 5-mile radius around the project boundary. We chose this geographic scope because the operation and maintenance of the Goldendale Project, in combination John Day Dam, Klickitat PUD facilities, wind energy development, the historic smelter, and ongoing cleanup of contaminated sites, could cumulatively affect raptors utilizing habitat in the Columbia Hills adjacent to the Columbia River and could cumulatively affect cultural and visual resources, including tribal access to and use of lands for traditional practices and purposes.

3.2.2 Temporal Scope

The temporal scope of our cumulative effects analysis includes a discussion of past, present, and reasonably foreseeable future actions and their effects on each resource that could be cumulatively affected. Based on the potential term of a new license, the temporal scope will look 30 to 50 years into the future. The historical discussion is, by necessity, limited to the amount of available information for each resource. The quality and quantity of information, however, diminishes as we analyze resources further away in time from the present. Our analysis of cumulative effects is found in the corresponding resource sections.

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[30] Mean precipitation for the area around John Day Dam for the years 2000 through 2023 is 12.79 inches. Information obtained from the National Weather Service website at: https://www.weather.gov/wrh/climate?wfo=pdt. Accessed March 22, 2023.

[31] The NEPA review of this project was prepared pursuant to CEQ's 1978 regulations.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effect 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 specific cumulative and site-specific environmental issues.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EIS. Based on this, we have determined that geology and soils, water quality and quantity, aquatic, terrestrial, threatened and endangered species, recreation, land use, aesthetic, socioeconomics, and cultural resources may be affected by the proposed action and action alternatives. We also discuss project effects on environmental justice communities. 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

Geologic Setting

The proposed project is located on the southern margin of the Columbia Hills, on the north side of the Columbia River, within the Yakima Fold and Thrust Belt portion of the Columbia Plateau Physiographic Province. The geologic units and features underlying the project and the surrounding region are generally divided into two main types: volcanic rocks and deposits, and unconsolidated sediments. The volcanic rocks of the Columbia Plateau are primarily accumulations of successive lava flows that erupted during the middle Miocene epoch. These basalt lava flows are several thousand feet thick across most of the Columbia Plateau, including within the proposed project boundary. Those units are overlain in several places by various types of unconsolidated sediments formed during the Pleistocene and Holocene epochs (figure 3.3.1-1). The loess deposits are characterized by unconsolidated silt and fine sand deposits of variable thickness. These loess deposits are widespread across the Columbia Plateau and extend into the proposed footprint of the upper reservoir and its associated laydown area. An alluvial fan deposit is mapped within the footprint of the lower reservoir.

Two areas of landslide deposits are mapped in the vicinity of the project along the steep bluff above the Columbia River. One occurs approximately 0.25 mile to the west of the proposed project and covers a broad area. The other is farther to the northeast, downslope from the existing access road that is proposed to be used to access the upper reservoir, on the face of the steep bluff. Landslide deposits in the area to the northeast typically consist of large blocks of rock debris in a matrix of finer sediment debris and thick deposits of angular fragments of basaltic talus accumulating at the base of steep slopes.

Faulting and Seismicity

The project is in an area of moderate folding and faulting. The Columbia Hills Anticline, a broad east-west trending anticlinal arch, underlies the Columbia Hills. A thrust fault associated with the southern limb of the anticline crosses the proposed project area trending west-southwest

to east-northeast. Local folds and faulting have obscured the surface expression of basalt stratigraphy near the project area.

Six earthquakes with a magnitude greater than 1.0, the greatest being 2.7, were reported within 5 miles of the project between 1970 and 2017. Two of the earthquakes, recorded in 2009 and 2012, were shallow (less than 1 kilometer) and were located approximately 3 to 4 miles west of the proposed project at the location of a historic landslide. Four earthquakes occurred east of the proposed project. The closest earthquake occurred approximately 2 miles to the east in June 2017 and had a reported magnitude of 1.7 at a depth of 8.4 kilometers (km).

The thrust faults in the vicinity of the project area are listed as being in areas where earthquakes would be likely to form, but the project is in Washington State Seismic Design Category B, which is the category representing areas with the lowest relative seismic risk.

A geotechnical investigation completed near the proposed site indicates seismic risks near the lower reservoir are primarily associated with soil liquefaction[32] and lateral spreading. Sediments present within the saturated zone beneath some areas of the proposed lower reservoir exhibit conditions that are conducive to liquefaction during earthquakes. This liquefaction potential also may contribute to increased chance of lateral spreading of soils during a seismic event.

Soils

Soils within the proposed project boundary are characterized within three general areas: the former CGA smelter site and proposed lower reservoir area; the proposed upper reservoir area; and the steep slope between the proposed reservoir areas.

Soils in each of these areas are distinct. Although several soil designations may be described in each area, the general characteristics of the soils share many common traits.

Former Smelter Site and Lower Reservoir Area

Portions of the project's proposed infrastructure would be located on the site of the former CGA smelter, which is now a RCRA contaminated site. The site, currently owned by NSC Smelter, LLC, is undergoing investigation and clean-up by the potentially liable parties (i.e., NSC Smelter, LLC and Lockheed Martin Corporation) and is being overseen by Washington DOE. Specifically, the lower reservoir and new water fill pipeline would be located within the footprint of Solid Waste Management Unit number 4 also known as the WSI. The site contains approximately 89,000 cubic yards of sludge primarily composed of alumina, dust, and particulates from wastewater and residual waste generated by plant emission control systems. The contents of the WSI were tested and determined not to be hazardous or dangerous.

The WSI was closed in September 2004, through consolidation and grading of the WSI contents and placement of an engineered RCRA cap consisting of a sand layer, a geosynthetic

[32] Soil liquification is a process in which the shaking of the ground during an earthquake can cause the soil to act more like a liquid than a solid and become less stable.

clay layer, a 30-mill polyvinyl chloride geomembrane liner, a geotextile drainage layer, and soil cover. A Closure and Post-Closure Plan was prepared in November 2004, including provisions for long-term maintenance and groundwater monitoring. In November 2005, Washington DOE accepted certification for WSI closure.

The soils around the lower reservoir that have not been disturbed by smelter activities generally consist of a mixture of Horseflat and Dallesport cobbly silty loams, Ewall loam sand, bedrock outcrops with Haploxeroll soils, and land associated with developed areas of the former smelter site. The Horseflat soils are typically developed in loess over basalt and on colluvium containing basalt fragments and loess on and at the base of steep slopes. Dallesport and Ewall soils are typically developed on outburst flood sediment deposits containing a mixture of cobbles, sand, and silt. The Haploxeroll soils are typically a thin alluvium cover over bedrock.

Each of these soils is described as well-drained, with low to moderate water erodibility (table 3.3.1-1). Wind erodibility is moderately low for Horseflat soils, low to moderately high for Dallesport soils, high for the Ewall soils, and moderately high for Haploxeroll soils.

Upper Reservoir Area

Soils in the upper reservoir area primarily consist of a mixture of Lorena silt loam and Goldendale silt loam, with some areas of Rockly very gravelly loam. Lorena soils are predominantly weathered basalt, and Goldendale soils are predominantly loess. Rockly soils are predominantly basalt colluvium with some loess and minor volcanic ash. Rockly soils are predominant along the top of the steep slope separating the lower reservoir area from the upper reservoir area.

Each of these soils is described as well-drained, with low to moderate water and wind erodibility (table 3.3.1-1).

Steep Slope Between Reservoir Areas

Soils on the steep slope separating the reservoir areas are sparse, consisting primarily of rock outcrops and rubble with a veneer or pockets of Haploxeroll soils; Horseflat cobbly silty loam and Horseflat soils complexed with other, similar soil types; Rockly very gravelly loam; and minor Onyx silt loam. Rock outcrops and colluvium with associated areas of Haploxeroll soils cover much of the steep face of the slope. Horseflat soils are typically developed in loess over basalt and on colluvium containing basalt fragments and loess on and at the base of steep slopes.

Rockly soils are predominantly basalt colluvium with some loess and minor volcanic ash and are predominant along the top of the steep slope separating the lower reservoir area from the upper reservoir area. Onyx soils consist of alluvium lying on nearly flat ground.

Each of these soils is described as well-drained, with low to moderate water and wind erodibility (table 3.3.1-1).

3.3.1.2 Environmental Effects

Remediation of the Former Smelter Site

To construct the lower reservoir, FFP proposes to excavate, remove, and dispose of all materials within WSI off site. This includes all the waste, the cap/cover, under liner and piping systems, and some depth of underlying soils. FFP estimates that 145,550 cubic yards of materials would need to be removed. There are no other Solid Waste Management Units located within the project boundary or that would be disturbed by project construction and operation.

FFP filed a West Surface Impoundment Plan on November 20, 2020, that includes methods for excavating and disposing of contaminated soils and liner materials associated with the WSI. Prior to mobilizing any equipment or personnel to the site, FFP will prepare the following planning documents for Washington DOE review and approval: a Work Plan describing in detail the planned activities (e.g. mobilization, establishment of site support facilities, soils/materials sampling and analysis) related to the removal of the WSI and impacted soils beneath the WSI; a project specific Health & Safety Plan covering the phases and activities planned for the project; a Construction Quality Assurance Plan; and Public Participation Plan. FFP would reuse the vegetative cover material of the cap to the extent practicable because it has not been in direct contact with the WSI contents. Remaining contents would be excavated, direct-loaded, and transported off-site for disposal as a non-hazardous, non-dangerous waste material. Excavation work would be monitored and use best practices for minimizing generation of dust during the excavation and load-out process. Transport trucks would be covered to mitigate dust generation during transport to the disposal facility.

Construction of the lower reservoir would also require closing 15 groundwater monitoring wells that were installed to monitor groundwater quality at the smelter as part of the site cleanup. Under the clean-up efforts, monitoring of the wells by the responsible parties is intended to continue for 30 years from the time of the WSI closure in 2004 or until contaminants are below screening levels. FFP filed a Monitoring Well Plan on November 20, 2020. For those wells that are located within the proposed lower reservoir, FFP would withdraw the well casing completely, filling the borehole with a bentonite slurry as the casing is withdrawn in accordance with the requirements in WAC 173-160-381(1)(b). The monitoring wells located outside the proposed location of the lower reservoir would be decommissioned by withdrawing the entire well casing, and filling the borehole with cement grout, neat cement, or bentonite in accordance with WAC 173-160-381(1)(b). Replacement monitoring wells will be installed by a Washington Licensed Well Operator under the supervision of a Washington Licensed Geologist following requirements for drilling, casing, and well completion as required by WAC 173-160.

The Environmental Groups recommend (recommendation 4) that FFP ensure that a complete remediation plan is prepared with the parties involved in the cleanup of the CGA smelter site and that this remediation plan be developed, synchronized, and in place prior to any project construction or final license for the project. American Rivers commented that the consequences of project construction without an exhaustive cleanup plan for the CGA smelter site, developed in collaboration with and approved by Washington DOE, could be significant for Columbia River surface water and groundwater.

Our Analysis

Removing the soils within WSI could expose the soils to water and wind erosion, which could lead to the contents of the WSI reaching surface waters. As discussed below, although the site contents are not considered to be hazardous, dangerous waste material, implementing BMPs to control erosion would minimize the potential release of containments until all the contents of the disposal site are removed and properly disposed of off-site. Although the site has been capped and closed, removal and proper disposal off-site of the contents of the WSI would be a long-term benefit because it would eliminate a potential source of containments to local ground and surface waters.

Contaminated groundwater in the uppermost aquifer beneath the WSI and the CGA smelter is being monitored as part of the cleanup of the CGA smelter site. FFP's proposed well closure procedures are consistent with accepted practices. The monitoring wells would be replaced and FFP's proposed coordination efforts would ensure that site construction and eventual operation do not interfere with the site remediation efforts being overseen by Washington DOE

Soil Erosion and Stormwater Pollution During Construction

Project construction activities including excavating the upper and lower reservoir and improving existing access roads would require the use of heavy equipment, vegetation disturbance and removal, stockpiling of soils, and the transport and disposal of large quantities of soil. Subsurface excavation, blasting, and tunneling would be required to construct the penstocks and powerhouse and substation caverns. About 280 acres of land would be cleared and disturbed to construct the above-ground facilities. Preliminary estimates of cut and fill volumes associated with construction of both reservoirs would equate to approximately 12 million cubic yards. Other features of the proposed project that would require excavation, fill, or grading include (but are not limited to) substation and switchyard construction, utility infrastructure tie-ins, and temporary construction laydown and parking areas. Preliminary estimates indicate that approximately 1 million cubic yards of fill would be needed. Leftover fill from powerhouse cavern and transformer gallery excavation could be re-used on site, if deemed suitable.

If uncontrolled, these land-disturbing activities could cause soil erosion, dust, and sedimentation of aquatic habitat in the Columbia River and several ephemeral tributaries to Swale Creek. Soil erosion can lead the loss and degradation of wildlife and aquatic habitats and poor water quality.

To minimize the potential for soil erosion during construction, FFP proposes to develop an erosion and sediment control plan and a stormwater pollution prevention plan that would use BMPs endorsed by the state of Washington. These BMPs would include provisions for minimizing areas of disturbance, installing silt fencing, coir logs, and other measures around disturbed areas and soil stockpiles, and protecting and revegetating areas of exposed soil with native species. In addition, FFP would include water diversion structures to direct silty water from a work zone to a sediment control area and install sediment control measures such as silt fencing, geotextile cloth, straw bales, and berms near both permanent and ephemeral waterbodies. FFP would also include measures to control windblown dust and soil, such a

periodic watering of surface roads. Transport trucks would be covered to mitigate dust generation during transport to the disposal facility. Excavated material would be tested to determine whether the material is suitable for use in the reservoir embankments. If the excavated material is unsuitable for embankment fill, it would either be used for other aspects of the project or disposed of at an appropriate off-site facility.

Our Analysis

The low rainfall and soil types with low to moderate erosion potential at the project site would minimize the potential for water erosion. However, because of the relatively windy conditions in this area, there is a high potential for wind erosion, particularly around the lower reservoir where the soil types have a low to moderate range of wind erodibility factors. Prompt revegetation and implementation of the control measures that would be included in FFP's proposed erosion and sediment control plan and stormwater control plan would further limit the potential for soil erosion during construction. The potential BMPs FFP proposes to include in the plan are standard measures that are known to prevent erosion and sediment transport until the sites can be permanently stabilized. Overall, the FFP's proposed measures are consistent with industry standards for erosion and sediment control and should minimize the effects of soil disturbance on sensitive terrestrial and aquatic resources. With erosion control measures in place, potential impacts to soils and geologic resources are not expected to be significant.

Seismicity

Although located in a relatively low probability risk seismic zone, there is some potential for seismic events in the vicinity of the lower reservoir to cause soil liquefaction and lateral spreading. FFP states that geotechnical studies would be performed in the next phase of project engineering design to evaluate these risks. The results of these investigations would be factored into the project design details in preparation for construction. Future project engineering designs would include measures to ensure safety of project structures pursuant to FERC Dam Safety protocols.

Our Analysis

If soils around the lower reservoir were to liquify during a seismic event, the embankment and liner of the lower reservoir (and other project elements) could be damaged. The potential for such events to be triggered by an earthquake generated at one of the local faults is unlikely, as previous geotechnical studies have concluded that the faults in the vicinity of the proposed project are not capable of producing earthquakes (Shannon & Wilson 2002). FFP's proposal to conduct further geotechnical studies, incorporate those findings into the final design of the reservoirs, and construct the project consistent with the Commission's dam safety requirements should mitigate the risk of dam failure and any subsequent adverse effects on the land and waters.

3.3.2 Aquatic Resources

3.3.2.1 Affected Environment

Water Quantity

Surface Water

Project features would be constructed in two distinct hydrologic subbasins. The northern portion of the project area, where the upper reservoir and temporary laydown area would be constructed, is in the headwaters of Swale Creek. Flows in this portion of the project drains to the north to Swale Creek, which flows westward to the Klickitat River. The Klickitat River then flows south and discharges to the Columbia River roughly 35 miles downstream of the proposed project (Washington DOE, 2022a). The northern portion of the project area is located on a steep bedrock bluff about 2,500 feet above the lower portion of the project area. The lower portion of the project area, where the lower reservoir and associated power production infrastructure and project transmission line would be constructed, is located on a topographic bench about 1,500 feet from the Columbia River. Flows drain directly to the Columbia River in this watershed.

The Columbia River is the largest surface water feature near the project and is the ultimate receiving waterbody for discharges of all surface waters in the project vicinity. John Day Dam, which creates Lake Umatilla, is located on the Columbia River immediately upstream of the project. The project is adjacent to, and the project transmission line would cross, Lake Celilo, which is impounded by The Dalles Dam approximately 24 river miles downstream of John Day Dam.

Average yearly precipitation in the northern portion of the project area is about 17 inches and in the southern project area about 10 inches (HDR 2020b). This portion of the Columbia River Basin typically experiences precipitation during the late fall, winter, and spring and is mostly in the form of rain. Streamflow normally peaks during the late spring and/or early summer from snowmelt runoff in the upper portion of the watershed. Low flows within the project area typically occur during the late summer or early fall, after snowmelt and before the runoff from the fall storms moving in from the Pacific Ocean (NPCC, 2022).

The U.S. Drought Monitor currently classifies the portion of the Columbia River Basin encompassing the project in an abnormally dry to extreme drought (NDMC, 2022). Analysis of climatologic and hydrologic information for the entire Columbia River Basin indicates more winter precipitation is falling as rain and snowpack has declined by about 25% throughout the Northwest where cool-season temperatures have risen 2.5°F over the past 40 to 70 years. Warmer winters in the Columbia River Basin are causing earlier spring runoff followed by decreasing streamflow in late spring, summer, and early fall. Peak spring runoff is occurring anywhere from a few days to 25-30 days earlier throughout the region (UCS, 2011).

The Columbia River is highly regulated with a variety of management features related to irrigation, flood control, power generation, and environmental requirements. The USGS operates a streamflow gage at The Dalles Dam. Table 3.3.2-1 provides monthly discharge statistics for the Columbia River at The Dalles, Oregon.

Surface Water Supply and Water Demand

Surface water supplies reflect the total amount of surface water generated (i.e., runoff volume) in a watershed. Based on historical records (1981 to 2011) Washington DOE estimates that the Columbia River Basin supplies about 126.5 million acre-feet of water per year. By 2035, Washington DOE forecasts a 14.6% increase in annual water supplies across the Columbia River Basin (126.5 to 145 million acre-feet per year), and a shift in supply timing. Washington DOE projects that unregulated surface water supply between June and October would decrease 10.3% and increase by 30.8% between November and May (Washington DOE, 2016).

Agricultural use (i.e., irrigation) is the largest consumptive water demand in the Columbia River Basin. Under current withdrawal patterns, insufficient flows for aquatic ecosystems caused by irrigation withdrawals typically occur during July and August, particularly during low flow years. Other consumptive uses include diversion demands for nearby municipalities. Historically, agricultural water demands totaled 10.1 million acre-feet per year for the entire Columbia River Basin and 4.2 million acre-feet per year for the Washington portion of the Columbia River Basin. By 2035, Washington DOE projects agricultural demand for the entire Columbia River Basin to decrease by 4.9% (10.1 to 9.6 million acre-feet per year) and by 6.9% (4.2 to 3.9 million acre-feet per year) for the Washington portion. For the same period, Washington DOE projects municipal demands for the Washington portion of the Columbia River Basin to increase by 15% (from 433,418 acre-feet per year to 513,141 acre-feet per year) (Washington DOE, 2016).

Groundwater

Groundwater conditions in the southern portion of the project area are separate and distinct from those of the northern portion. Groundwater found in the basalt aquifers of the southern portion of the project area flows generally southwest toward to the Columbia River. Groundwater in this area ranges from 2 to 25 feet below ground surface and seasonally fluctuates up to 2 feet in the general project area. Groundwater found in the basalt aquifers of the northern portion of the project area flows generally westward towards the Swale Creek watershed. While some springs were identified outside of the project area, groundwater in this area was typically encountered at depths greater than 80 feet below ground surface.

Water Quality

The reach of the Columbia River encompassing Lake Celilo and Lake Umatilla in the project vicinity is designated in Washington for aquatic life uses (spawning/rearing); recreation use (primary contact); domestic, industrial, agricultural, and stock water supply uses; wildlife habitat; harvesting; commercial/navigation; boating; and miscellaneous aesthetics uses (Washington DOE, 2022a). The Oregon Department of Environmental Quality has identified similar designated uses for this portion of the Columbia River, including fish and aquatic life; fishing water uses; and public and private domestic, water contact recreation, and aesthetic quality (Oregon DEQ, 2020). Washington DOE's current 303(d)[33] list includes Lake Umatilla as

[33] The Clean Water Act requires that each state report on the health of its waters (known as a section 305(b) report), including the section 303(d) list of impaired waters, every two years.

a category 5 waterbody that is impaired for water temperature, pesticides, and polychlorinated biphenyls in fish tissue and Lake Celilo as a category 5 waterbody impaired for water temperature (Washington DOE, 2022a). Lake Umatilla and Lake Celilo are also both impaired and subject to a Total Maximum Daily Load for dioxins in fish tissue, and Lake Celilo is impaired and subject to a Total Maximum Daily Load for total dissolved gas.

Designated uses for Swale Creek include salmon spawning, rearing, and mitigation; primary contact recreation; domestic, industrial, and agricultural water supply; stock watering; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetic values (Washington DOE, 2022a). The lowermost approximately 3 miles of Swale Creek, within Swale Canyon, does not meet applicable water quality standards for temperature—based on supplemental protection for salmonid spawning and incubation—and therefore is on the state 303(d) list (Category 5) for temperature (Washington DOE, 2016a). Table 3.3.2-2 shows Washington DOE's water quality standards required for surface waters of freshwater environments to support aquatic life (salmon spawning, rearing, and migration). Additionally, the first 12 miles of Swale Creek from the mouth are designated by Washington DOE as waters requiring supplemental protection for salmonid spawning and incubation, dictating more stringent water quality standards for water temperature (Washington DOE, 2011). From February 15 through June 1, the 7-day average daily maximum temperature value must not exceed 13ºC (55.4ºF).

Washington waters supporting domestic, industrial, agricultural, and stock water supply use require toxic, radioactive, or deleterious material concentrations be less than those which have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health.[34] Washington waters supporting domestic, industrial, agricultural, and stock water supply use require that aesthetic values not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.[35]

3.3.2.2 Environmental Effects

Swale Creek and Columbia River Flows

Constructing the upper reservoir would require the filling of two ephemeral streams (S7 and S8) and one stock watering pond P2 (0.03 ac) and once constructed, the upper reservoir would capture precipitation that would normally drain through the ephemeral streams to Swale Creek. Constructing the lower reservoir and its associated temporary construction staging area would not directly impact any surface water features but would capture precipitation that would normally drain into the Columbia River.

[34] WAC sections 173-201A-240 and 173-201A-250 describe the toxic and radioactive substances criteria.

[35] WAC section 173-201A-230 provides guidance on establishing lake nutrient standards to protect aesthetics.

The project would require 7,640 acre-feet of water to initially fill the project reservoirs and 360 acre-feet for annual refill. FFP would purchase Columbia River water from Klickitat PUD, using Klickitat PUD's existing municipal use water right (maximum annual withdrawal of 15,591 acre-feet at a max flow rate of 35.3 cfs). FFP expects to complete the initial fill of the project over a period of 6 to 12 months. To minimize leakage, FFP would double-line the lower reservoir with a geosynthetic layer and a waterproof concrete liner as the second layer. FFP states that the upper reservoir would be lined with a hydraulic asphalt concrete (HAC) liner system. The reservoir lining system would be comprised of a HAC layer overlying an asphaltic base layer (ABL). The HAC layer would be protected by a mastic coating to provide ultraviolet protection and increase the service life of the facility. The ABL would serve as the inner leakage collection system which would drain leakage from the HAC layer to different sumps located at the low points of the reservoir, where the water would be monitored and pumped back into the reservoir.

Washington DOE (2022b) states that while Klickitat PUD's existing water use permit does allow a maximum annual withdrawal of 15,591 acre-feet, the permit limits withdrawal to a maximum annual consumptive use of 4,851 acre-feet. Washington DOE notes this withdrawal limit would stretch the initial fill of the project over a two-year period instead of FFP's proposed 6-to-12-month period.

American Rivers and the Environmental Groups express concern that any reduction in flow to Swale Creek could have long-lasting impacts on salmon spawning, rearing and migration, domestic and agricultural water supply, terrestrial wildlife habitat, stock watering, aesthetics, and recreation well downstream of the project. They also express concern that project withdrawals would affect water quality and quantity in the Columbia River.

Our Analysis

The project would be located within two subwatersheds within the Middle Columbia Basin. The upper reservoir would be in the Swale Creek subwatershed, which drains into the Klickitat River which then drains into the Columbia River approximately 32 river miles downstream of John Day Dam. The lower reservoir, substation, and transmission line would be in the Columbia River Tributaries subwatershed which drains directly into the Columbia River. Both subwatersheds are within the Middle Columbia Basin and in Washington's Klickitat Watershed, Water Resource Inventory Area 3. The project reservoirs would only collect precipitation that falls directly on the reservoirs. Both reservoirs when complete (61 acres for the upper reservoir and 63 acres for the lower reservoir) would capture and retain a total of about 170 acre-feet of rainfall each year (based on project area average rainfall of 17 inches) that would otherwise either flow into Swale Creek and the Columbia River or be absorbed into the ground. The upper reservoir would capture 86 acre-feet per year of rainfall that currently reaches Swale Creek through tributary streams (streams S7 and S8) and groundwater. However relative to the 103,883 acre-feet per year of rainfall runoff that Swale Creek receives (Washington DOE, 2022a), this impact would be minimal. The amount of water captured within the reservoirs is negligible and would have minimal impacts on Swale Creek, the Klickitat River, and the Columbia River because each reservoir represents less than 1% of Swale Creek and Columbia

River tributaries subwatersheds, and even less when compared to the larger drainages for the Klickitat River (where Swale Creek drains into) and the Middle Columbia River basin.[36]

Compared to the average runoff for the Columbia River (126.5 million acre-feet) the amount of initial fill (7,640 acre-feet) and annual make-up (360 acre-feet) water needed for project operation is negligible and appears to be within Klickitat PUD's existing water rights; therefore, project construction and operation would not result in a significant change in Columbia River flows, water supply or impacts to other water right holders.

Hazardous Spill Prevention and Control

Uncontrolled discharges of hazardous substances can degrade water quality and adversely affect fish and wildlife. Construction activities and equipment would require the storage and use of fuel oil and other hazardous substances such as lubricating and hydraulic oils. Some of these substances would be kept onsite for project operation and maintenance purposes. Use of these substances would pose a risk of hazardous materials spills if measures were not implemented to facilitate safe storage on site, and to quickly respond to spills or leaks should they occur.

FFP proposes to develop a hazardous spill control plan to address potential issues resulting from spills of hazardous substances during construction, operations, or maintenance. The plan would include: (1) a description of project operations; (2) the general types of chemicals in use and stored; (3) a project plan map indicating hazardous substance storage areas; (4) materials handling procedures and storage requirements; (5) spill cleanup procedures for areas and processes in which spills may occur; (6) training of key training of key personnel in the implementation of the plan; (7) the posting of summaries of the plan around the project to facilitate implementation of response actions; and (8) revising the plan as conditions or operations change at the project (e.g., from construction to operations). BMPs that would be implemented during operation include: (1) notification to regulatory agencies, including local authorities, in accordance with applicable federal and state regulations if a spill may reach surface water or groundwater; and (2) placement of emergency spill containment and cleanup kits (appropriate to the hazardous substances in use) in areas where they are easily accessed and used, with locations modified or moved as operations and activities change/progress at the project.

Our Analysis

Although most of the construction at the project would occur in upland areas, some construction would be close to the tributaries to Swale Creek and the Columbia River. Any hazardous material spills or equipment leaks at these sites could allow contaminants to migrate into surface waters, which could degrade water quality and adversely affect fish and wildlife. FFP's proposed measures for inspecting construction equipment, storing hazardous materials, maintaining equipment on site to clean up unintentional spills, and educating employees are practices known to minimize the effects of a release of hazardous substances and other pollutants

[36] The drainage area for the Swale Creek subwatershed, the Columbia River Tributaries subwatershed, the Klickitat River watershed, and the Middle Columbia River basin are approximately 18,711, 58,042, 865,280, and 7,196,160 acres, respectively.

to surface waters during project construction and operation. Although the current plans do not suggest that Corps land would be used to store hazardous material, the Corps notes that it will not allow any hazardous materials to be stored on its land.

Reservoir Water Quality and Monitoring

Recycling water between the reservoirs could, over time, degrade the water quality in the project reservoirs through eutrophication and evaporation that concentrates dissolved solids and heavy metals. FFP proposes to monitor water quality in the reservoirs to ensure that dissolved solids, nutrients, and heavy metals do not rise to concentrations that could adversely affect aquatic life and wildlife. FFP filed a draft reservoir water quality monitoring plan detailing the long-term sampling procedures and parameters. Water quality samples would be collected annually in the summer and results reported to Washington DOE and the Commission. If any results are discovered that warrant concern, appropriate measures to address the deteriorating water quality (if found) and necessary modifications to the monitoring plan would be discussed at that time. If water quality monitoring indicates that a water quality criterion has been exceeded, FFP proposes to: (1) contact staff at Washington DOE and request a conference call to discuss the exceedances and possible causes; (2) propose appropriate measures to confirm the nature of exceedance (resampling) and mitigation measures; (3) submit a report with proposed measures to Washington DOE for review and approval; and (4) implement adaptive management measures, as agreed upon with Washington DOE.

In addition, FFP proposes to cover the reservoir surface with shade balls which is expected to reduce evaporative loss and lessen the attraction of the reservoir to birds and other wildlife.

Without elaboration as to how, the Environmental Groups recommend that FFP ensure that ongoing project operations do not result in violations of water quality standard or non-attainment of water quality criteria. The U.S. Environmental Protection Agency (EPA) expressed concerns regarding eutrophication and the potential release of nutrient rich and warm water on surface and ground water sources. EPA also commented that mercury levels are of particular concern in reservoirs as reservoirs tend to have higher methylmercury levels than natural lakes and streams due to fluctuations in water levels that expose sediments to air. Methylmercury is the more bioavailable form of mercury and therefore has a greater potential to impact wildlife once introduced into the broader food web via bioaccumulation and biomagnification.

NMFS recommends, pursuant to section 10(a) of the FPA, that FFP be prohibited from releasing effluent discharge into the Columbia River at any point during project construction or operation. If this is not possible, NMFS requests "consultation to ensure water quality standards are met if releasing recycled water back to the Columbia River and into the critical habitat of ESA-listed salmonids becomes necessary over time."

In its reply comments, FFP states that its water quality monitoring program would identify water quality concerns and does not anticipate any need to discharge effluents to the Columbia River.

Our Analysis

Eutrophication is the buildup of nutrients in a waterbody, typically phosphorous or nitrogen, that leads to excessive plant and algae growth and poorly oxygenated water. This typically happens due to agricultural and industrial runoff. The new project reservoirs would not capture agriculture or industrial runoff, so the only potential source of such nutrient loads at the project will be the Columbia River. There is no information on the water quality in Klickitat PUD's intake pool. However, continued pollutant and nutrient loading in the Columbia River is expected due to farming activities, industry, and urban and agricultural runoff (Corps et al., 2020). The lower Columbia River contains a wide variety of human-sourced compounds, including metals and organic compounds. Thus, it reasonable to assume that water quality in the intake pool could contain high levels of nutrients and metals that could build up in the project reservoirs and water quality could degrade overtime.

Concentrations of mercury and other metals sometimes increase in newly constructed reservoirs and can cause increases in bioaccumulation of mercury in fish and, in turn, wildlife (Willacker et al., 2016; Bilodeau et al., 2017). The surface of the reservoir will be covered with shade balls which should reduce evaporation, which in turn should reduce the rate that solids and heavy metals concentrate in the reservoirs.

Prohibiting FFP from releasing effluent from reservoirs and construction areas to the Columbia River would minimize construction and operation impacts on water quality. However, an emergency or accident could result in a discharge, such as a failure of the reservoir, underground penstocks, or overfilling of the reservoir. The reservoir capacities are large enough to contain both the reservoir volumes to prevent overfilling. If a license is issued, the Commission's Division of Dam Safety and Inspections would evaluate the stability of the reservoir embankment dams under all probable loading conditions, including seismic loading. The Division of Dam Safety and Inspections would review geotechnical studies provided in support of the project's final design to ensure that project features are designed to safely withstand all credible loading conditions and ensure safe operating conditions. Furthermore, a Board of Consultants with expertise in dam design would be formed to independently review the project designs to ensure that project structures are appropriately designed to withstand seismic events and other hazards that could cause a failure of the facilities.[37] The Commission would not allow construction to begin until the project facilities satisfactorily meet the criteria of the Commission's Engineering Guidelines and the designs are shown to be safe and adequate.

FFP's proposed reservoir water quality monitoring plan would include, at a minimum, procedures for monitoring water quality in the project reservoirs (i.e., dissolved solids, nutrients, and heavy metals) during initial fill and each year during project operation to inform the need for additional protective measures for water quality. This would alert FFP to when water quality

[37] A Board of Consultants are retained to review the design, specifications, and construction of a project for safety and adequacy. Specifically, they assess the geology of the project site and surroundings; the design, specifications, and construction of the dikes, dams, spillways, powerhouse, electrical and mechanical equipment, and emergency power supply; instrumentation; the filling schedule for the reservoir(s) and plans and surveillance during the initial filling; and construction procedures and progress.

conditions are degrading and warrant remediation before they rise to levels that could adversely affect fish and wildlife. However, FFP does not describe what remediation could entail. This is reasonable because treatment would depend on the water quality parameters that are failing. Remediation measures could include treating the water or removing and disposing of the water off-site at an approved facility. Further, because the project would be operated as a closed-loop pumped storage project, no discharges to the Columbia River are anticipated during project operation.

Groundwater

A portion of the lower reservoir could extend beneath the existing water table, requiring the temporary dewatering of local groundwater resources during construction. The WSI does not extend to the groundwater surface so its removal should not expose its contents to groundwater sources.

FFP's Draft Dewatering Plan includes procedures for sampling and managing non-stormwater discharges (i.e., dewatering activities) during construction and adaptive management procedures if the water is found to be contaminated. As noted previously, FFP would double-line the lower reservoir with a geosynthetic layer and a waterproof concrete liner as the second layer.

Our Analysis

Dewatering during the construction of the lower reservoir could create a temporary alteration of existing groundwater flows, creating drawdown areas that divert the natural flow of groundwater toward the dewatered location. Drawdown effects would dissipate at increasing distance from the dewatering location. Dewatering during construction would create a temporary and minor reduction in the quantity of groundwater reaching its existing discharge location. Once constructed, the lower reservoir would redirect groundwater flows around the reservoir but would not alter the quantity of groundwater flows.

FFP's proposed Dewatering Plan would allow FFP to collect and monitor groundwater during construction and ensure that its contents are not contaminated. FFP's proposed reservoir lining would minimize leakage and ensure that project contents do not degrade groundwater quality. Thus, project construction and operation are not expected to alter groundwater quality.

3.3.3 Fisheries Resources

3.3.3.1 Affected Environment

Aquatic Habitat

As noted above, surface waters that could be affected by project construction and operation occur in the Swale Creek and in the Columbia River watersheds. Streams 7 and 8, which flow into Swale Creek, are both ephemeral stream channels that do not provide habitat for fish due to their intermittent and disconnected nature. Flow in Swale Creek upstream of river mile 3.1 is intermittent and does not provide habitat for fish due to this lack of year-round hydrologic connectivity (Washington DOE, 2022a, WPNAC, 2004).

Aquatic habitat in the mainstem Columbia River is highly modified by the Federal Columbia River Power System, which converted the majority of accessible habitat in the river to a series of deep, low-velocity pools impounded by hydroelectric dams with little habitat diversity (Washington DOE, 2022a). Shoreline conditions near the proposed project are highly modified by the dam, infrastructure associated with power generation and the former CGA smelter. Little to no riparian vegetation is present, banks are typically armored with large cobble or boulders, and channel complexity is lacking (Washington DOE, 2022a).

Fish Community

The initial filling for the reservoirs and periodic maintenance fills would be purchased from Klickitat PUD. As discussed previously, Klickitat PUD currently withdraws water from an intake pool located adjacent to the Columbia River upstream of John Day Dam. The intake pool is separated from the Columbia River by the Burlington Northern Santa Fe railroad embankment and water is drawn into the pool from the Columbia River via seepage through the embankment material and a culvert that connects the pool with the John Day reservoir. Klickitat PUD's pumping station consists of an infiltration gallery in an excavated channel approximately 93 feet wide and 28 feet deep, containing six vertical pumps installed in 48-inch diameter perforated casings surrounded by 2,400 cubic yards of clean gravel. Water in the intake pool seeps approximately 30 feet through the gravel to the pump casings where it is pumped up and conveyed to a water supply vault via an existing 2-mile-long industrial water conveyance line also owned by Klickitat PUD. FFP's Pre-Applicant Document states during the aquatic reconnaissance survey of the intake pool on May 4, 2015, bluegill and smallmouth bass were observed in small schools within the littoral zone along the southeast shoreline of the intake pool (i.e., along the railway embankment). FFP also states that walleye, yellow perch, and largemouth bass have been documented in the intake pool based upon anecdotal angling information and that other cyprinid species (i.e., minnows) are likely found in the intake pool as well. FFP states that while some resident fish species have been observed in the intake pool, it's unclear if their presence is the result of entrainment through the culvert within the railway berm, introduction from anglers, or predatory wildlife dropping their prey.

The fish community in the Columbia River near John Day Dam includes at least 52 species including resident, adfluvial,[38] and anadromous species. Bluegill, black and white crappie, largemouth and smallmouth bass, walleye, and yellow perch represent important resident game species in the river near the proposed project boundary. Anadromous species include steelhead; Chinook, coho, and sockeye salmon; Pacific and river lamprey; and American shad. This portion of the Columbia River also provides critical habitat and essential fish habitat for several anadromous salmonids (see section 3.3.5). Adfluvial species include white sturgeon and bull trout. The John Day Dam adult fish passage facilities include a north shore ladder to pass fish from entrances at the north end of the spillway, and a south shore ladder to pass fish from entrances along a collection channel extending the full length of the powerhouse (Corps, 2013). Counting stations are provided in both fishways (Corps, 2013).

[38] An adfluvial life history pattern is when spawning and rearing occur in tributary streams followed by migrating to lakes or reservoirs to mature.

3.3.3.2 Environmental Effects

Swale Creek and Klickitat River Flows

American Rivers commented that constructing the upper reservoir has the potential to alter instream flows within Swale Creek and the Klickitat River (which Swale Creek drains into), which could have long-lasting impacts on salmon spawning, rearing and migration, domestic and agricultural water supply, terrestrial wildlife habitat, stock watering, and aesthetics and recreation well downstream of the project's upper reservoir.

Our Analysis

Construction of the upper reservoir and subsequent continued operation would capture 86 acre-feet per year of rainfall that currently reaches Swale Creek through tributary streams (streams S7 and S8) and groundwater. However relative to the 103,883 acre-feet per year of rainfall runoff that Swale Creek receives (Washington DOE, 2022a), this impact would be minimal. As such, the proposed construction and operation of the Goldendale Project would have minimal effect on aquatic resources in Swale Creek and in turn, on aquatic resources in the Klickitat River.

Columbia River Flows

The Columbia River near the proposed project provides habitat for at least 52 fish species, including those with resident, adfluvial, and anadromous life histories. In addition to providing habitat for all life stages of resident species, the river provides migratory habitat for ESA-listed populations of white sturgeon; bull trout; steelhead; Chinook, coho, chum, and sockeye salmon; river and Pacific lamprey; and American shad. Effects on the ESA-listed species are discussed below in section 3.3.5.2, *Threatened and Endangered Species, Aquatic Resources*.

NMFS recommends, pursuant to FPA section 10(j), that FFP not withdraw water from the Columbia River for initial fill at any time from March 15 to October 15 and for periodic make-up water at any time from March 1 to November 1 to ensure sufficient Columbia River flows for out-migrating juvenile salmonids. NMFS states that the volume of flow in the Columbia River is strongly correlated with migration speed, ocean entry, and the survival of out-migrating juvenile salmonids. NMFS adds that Columbia River flows have been greatly diminished by a host of human activities (e.g., irrigation and municipal water use; Naik and Jay, 2011) and the proposed water used to support this project would exacerbate the reductions to river flow. NMFS reasons that FFP can avoid filling the reservoirs during the above periods because FFP's proposal already shows some flexibility in filling the reservoirs.

In its reply comments, FFP states that project water usage would be consistent with what is allowable under Klickitat PUD's water right. However, its flexibility in the timing of the initial fill is limited to maintaining consistency with the project's water agreement with Klickitat PUD but it would have more flexibility in withdrawing make-up water because it could be accomplished once per year or through multiple shorter withdrawals throughout the year.

Our Analysis

Minimum instream flows for the Columbia River are designated in multiple planning documents, including the Instream Resource Protection Program for the Columbia River (WAC 173.563) and NMFS's most recent BiOp (NMFS, 2020) for the operation of the Federal Columbia River Power System. The Instream Resource Protection Program for the Columbia River establishes minimum instream flows for the mainstem of the Columbia River to provide for the preservation of wildlife, fish, scenic, aesthetic, and other environmental and navigational values. Minimum instantaneous flows for John Day Dam are shown in table 3.3.3-1. Minimum flows specified pursuant to NMFS's 2020 BiOp are set annually by the Technical Management Team[39] during the migration season. The Corps currently releases seasonal minimum instantaneous flows of 12,500 cfs from John Day Dam from December through February, and 50,000 cfs from March through November (Corps, 2022a). These minimum flows are also released at the next upstream dam (McNary Dam) and the next downstream dam (The Dalles Dam).

The initial fill would require 7,640 acre-feet of water and is proposed to be completed over roughly six months at an average flow rate of approximately 21 cfs and a maximum flow rate of 35 cfs. The project is estimated to need 360 acre-feet of make-up water annually to replenish evaporative and seepage losses, which would be obtained in the same manner as the initial fill water. Klickitat PUD's Cliffs Water System would provide all water supply for the project's initial and maintenance fills under its existing municipal water right (certificate S3-00845C) with a priority date of March 19, 1969. Because the minimum instream flows set forth under WAC 173.563 and NMFS's BiOp were established later (June 1980 and 2008, respectively) the proposed project would not result in any new appropriation from the Columbia River or tributaries.

ESA-listed anadromous salmonids migrate past the John Day Dam from March through September each year but even if FFP were to obtain water from Klickitat PUD to fill the reservoirs during these months, the maximum rate at which FFP would receive water drawn from Klickitat PUD's intake pool (i.e., 35 cfs) represents approximately 0.03% of the median flow in the Columbia at The Dalles, Oregon USGS gage and 0.08% of the lowest Columbia River flow on record at this location.[40] The volume needed for initial fill (7,640 acre-feet) represents approximately 0.01% of the median volume of water expected to pass through the Columbia

[39] The Technical Management Team is an inter-agency advisory technical group, chaired by the Corps, and responsible for making recommendations on Columbia River Dam and Reservoir operations.

[40] The closest USGS gage to the project is at The Dalles, Oregon (ID#14105700), located on the Columbia River about 25 miles downstream of the project. Based on 140 years of record (1878 to 2018), the median average monthly flow was 144,950 cubic feet per second (cfs). Discharges for the period of record ranged from a minimum average monthly flow of 42,430 cfs in 1937 to a maximum average monthly flow of 1,002,000 cfs in 1894. The median volume of water in the Columbia River approaching the gage at this location in a calendar year is 81,084,418 acre-feet while the lowest volume on record was 37,646,337 acre-feet which was reported for the year 1937.

River at this gage in a given year and 0.02% of the minimum volume of water passing through at this location based on the period of record. The estimated 360 acre-feet needed each year for annual make-up water would be 0.0004% of the median volume of water passing through the Columbia River at this gage location in a year and 0.001% of the minimum volume of water passing through at this location based on the period of record. While these withdrawals would add to the losses occurring from irrigation and other withdrawals in the basin, they are relatively small temporary withdrawals that are not expected to impede ESA-listed salmon smolt migrations due to their relatively negligible amounts. We estimate NMFS' estimated timing restriction would likely result in FFP delaying completion of its initial fill for approximately 11 months compared to its proposal.

Predation and Noise

NMFS recommends, pursuant to section 10(j), that FFP not place permanent structures or impoundments in the Columbia River. In addition, NMFS recommends that FFP not pile drive in the Columbia River anytime between 1 March and 1 November to protect juvenile and adult migrants from high intensity sounds. NMFS reasons that the use of transmission line supports would negatively affect juvenile survival, as these structures provide habitat for both avian and aquatic predators and that fish predators use in-water structures to "hold" in areas that would otherwise be unavailable to them, and from which they can effectively ambush passing smolts (NMFS, 2022). NMFS also commented that underwater pile driving can produce high intensity sound that has been shown to impact fish through altered behavior, injury, and potentially mortality.

FFP states that it does not propose any in-channel structures during project construction. Further, the project transmission line would use an available space on an existing BPA transmission ROW for the Columbia River crossing and the connection to the John Day Substation in Oregon.

Our Analysis

Predation is a well-known cause of salmonid mortality. Significant numbers of salmon and steelhead are lost to fish, avian, and pinniped predators during migration and residency in the Lower Columbia River and estuary (Northwest Power and Conservation Council, 2004). As NMFS notes, the addition of overhead structures and pile driving could increase juvenile mortality by enhancing conditions for avian predation and altering juvenile behavior. However, because FFP would not install new structures in the river or conduct any pile driving, there is no reason to expect that predation on fishes in the Columbia River would increase due to project construction or operation or that noise from construction activities, all of which would be confined to the uplands above the Columbia River, would adversely affect fish behavior.

Entrainment

Because the project would use water withdrawn from the Columbia River by Klickitat PUD for the initial fill and for make-up water, Interior, NMFS, and the Environmental Groups expressed concern that fish could become entrained in the power system and be lost. As noted

earlier, Interior and NMFS believe Klickitat PUD's intake pool and pump station should be considered project facilities.

Accordingly, Interior recommends, pursuant to section 10(j), that FFP install and maintain fish screens on Klickitat PUD's pump station to meet NMFS and Washington DFW screening requirements. Interior further recommends that the Klickitat PUD's pump station be designed and operated as follows: (1) intake screens be designed to meet or exceed NMFS's salmonid criteria for approach velocities and screen size; and (2) a bubbler system be in place to monitor the pressure drop both inside and outside the fish screens. When a pressure drop is indicated and prior to intake start-up, an automated cleaning system (e.g., automated air burst system) would be initiated blowing air at the screens to backflush and knock any debris off the surface of the screen; (3) intake alarms be installed and maintained to monitor operational problems; and (4) if operational problems are identified by FFP and result in harm to fish species, FFP is to develop a plan to improve existing intake fish screens and/or develop solutions to direct fish species away from the project's intake. This plan would be developed in coordination with NMFS, Washington DFW, and FWS.

NMFS recommends, pursuant to section 10(j), that FFP, in cooperation with NMFS and other interested resource agencies and Tribes, conduct a fry and juvenile entrainment survey in Klickitat PUD's intake pool. After approval of the survey plan by NMFS and FERC, the survey would be completed within 12 months of license issuance and filed with FERC. NMFS states that if ESA-listed or unlisted species are found alive in Klickitat PUD's intake pool, the culverts and Klickitat PUD's pump station intake infiltration gallery would be subject to fry screening criteria.

The Environmental Groups recommend (recommendation 5) that FFP install and maintain fish screens on Klickitat PUD's pump station that meet or exceed NMFS and Washington DFW screening requirements and take any other measures developed in consultation with NMFS, FWS, Washington DFW, and the Yakama Nation, CTUIR, Nez Perce, and Warm Springs Tribes, to prevent the entrainment, impingement, or injury of salmon, steelhead trout, bull trout, Pacific lamprey, and other resident native fish.

In its reply comments, FFP asserts that because it is not proposing that Klickitat PUD's pump station be included as a project facility, the license cannot impose screening requirements on Klickitat PUD's pump station.

Our Analysis

On October 4, 2021, FFP filed a letter from Klickitat PUD dated September 7, 2021, in which Klickitat PUD describes its existing water pumping station. According to Klickitat PUD, the pumping station was constructed in 1970 and is configured as a large infiltration gallery[41] with no intake screen. The pump station draws water from a 3.75-acre "intake pool" that is

[41] An infiltration gallery is a subsurface water collection system that does not draw water directly from open water but instead relies on water from an adjacent waterbody to infiltrate through the riverbed or other permeable surface layers (such as gravel) into perforated pipes or conduits where the water can then be pumped.

separated from the Columbia River by a 500-foot-long rock and gravel filled embankment (i.e., railroad berm) to support the Burlington Northern Santa Fe railroad. The pump station is located on the northwest shoreline of the intake pool approximately 350 feet from the railroad berm. Six vertical pumps are installed in 20 to 30 feet deep and 48-inch diameter perforated casings, in an excavated channel approximately 28 feet deep and up to 93 feet wide and filled with approximately 2,400 cubic yards of clean gravel. According to Klickitat PUD, water from the Columbia River is drawn into the "intake pool" via seepage through the rock and gravel filled railroad berm. Water then enters Klickitat PUD's pump system by seeping through the 30 feet of gravel and into the perforated casings where it is pumped up into Klickitat PUD's water delivery system.

In its pre-application document submitted on January 28, 2019, FFP states the railroad berm is composed of coarse substrate materials filled with fine-grained substrates of unknown gradation and that the lack of interstitial spaces on the wetted portion of the embankment precludes the entrainment of juvenile fish in the intake pool.

Information in the PAD provided to FFP by the Burlington Northern Santa Fe Railway company indicate the potential presence of two 42-inch culverts within the general vicinity of the intake pool. However, after a visual inspection and an investigation with an underwater remotely operated vehicle in April 2015, only one culvert was located. The identified culvert is at approximately 265 feet mean sea level (MSL) on the intake pool side and 255.2 feet MSL on the John Day Reservoir side of the embankment.

FFP asserts that given the current normal operating levels of the John Day Dam, there is no opportunity for the identified culvert to be wetted and provide direct surface water connection to the intake pool. However, as NMFS points out, the normal forebay operating range at the John Day Dam is 260 to 265 feet from November to June and 265 to 268 feet from July to October (Corps, 2022a). While the culvert slopes towards the Columbia River and water does not flow towards the intake pool it appears that at least a portion of the culvert would be wetted given the normal forebay operating range and thus might provide fish access to the intake pool, particularly during the months of July through October when the forebay is consistently held at higher water level elevations. If fish were to pass into Klickitat PUD's intake pool, we assume the only way that a fish could exit the pool and re-enter the Columbia River would be back through the culvert or to swim through the rock and gravel railway embankment if there are interstitial spaces available. We do not know what the infiltration rate into the pool is or how withdrawing 35 cfs for the project might affect pool levels. If water levels in the pool drop below 265 feet, the culvert on the intake pool side may no longer be submerged for a time until the water level rises again. In this case, any fish in the intake pool would only be able to re-enter the Columbia River through the railway berm and if interstitial spaces within the berm would be available. Based on the above operating levels for the John Day Dam forebay, this scenario is more likely during the months of November through June when John Day forebay water levels typically fluctuate between 260 to 265 feet.

Even if fry and juvenile anadromous fish can enter Klickitat PUD's intake pool, it is unlikely that they would become entrained through Klickitat PUD's infiltration gallery at the northwest corner of the intake pool and then into the project's reservoirs because of the thickness of the gravel in the infiltration gallery. Interior, citing Bonnet 2013, states that while infiltration

galleries can be good at screening and diverting fish, they may be less effective at screening and diverting smaller age class salmonids, and/or less effective when operated differently at a higher proportional flow. In the Bonnet (2013) study, the infiltration gallery comprises a layer of gravel and small boulders (about 0.5 to 1 m deep) on top of three buried galleries ("open pipes"), each 25 m long and made of steel mesh with openings of 25 mm. Here, fry and juveniles must pass through 30 feet of gravel, which should be nearly impenetrable to even fry. Further, Klickitat PUD's pumping system has been operating since the 1970's and there is no information in the record that suggests its operations have been adversely affecting fish.

3.3.4 Terrestrial Resources

3.3.4.1 Affected Environment

Botanical Resources

FFP (2020) surveyed the project site for rare plants, the presence and extent of Washington DFW Priority Habitat and Species (PHS), and noxious weeds in 2019.

The proposed project is in the semi-arid Columbia Plateau Ecoregion of Washington, adjacent to the middle Columbia River (Washington DNR, 2015). Vegetation is broadly characterized by shrub-steppe and disturbed shrub-steppe habitat with smaller areas of mixed pine forest and scrub-shrub wetland. Dominant plant communities (habitat types) at the project are shown in figure 3.3.4-1. The area where the lower reservoir and associated power transmission infrastructure are proposed to be constructed consists mostly of previously developed or disturbed land, including lands occupied by former CGA smelter operations and crossed by major roads such as SR 14. Plant communities consist of introduced/invasive annual grassland intermixed with rock outcroppings that are dominated by cheatgrass, needle-and-thread grass, bulbous blue grass, buckwheat species, Menzies' fiddleneck, fern-leaf biscuitroot, and groundsel. The shrub layer consists primarily of rubber rabbitbrush, with some woody buckwheat species. Small areas of wetland, Introduced Woodland, and Inter-mountain Basins Cliff and Canyon habitats also occur in the area around the lower reservoir (Washington DNR, 2015). Introduced woodland tree species include Russian olive, ornamental pea family trees, black cottonwood, smooth sumac, sweet almond, and netleaf hackberry trees. Black cottonwood, netleaf hackberry, and smooth sumac are native, but are assumed to be planted given the development of the area.

The slopes between where the upper reservoir and lower reservoir would be constructed are composed of a mix of Inter-mountain Basins Cliff and Canyon and Inter-mountain Basin Big Sagebrush Steppe habitats. The Inter-mountain Basins and Cliffs habitat consist of steep cliff faces, narrow canyons, unstable scree and talus slopes, and rock outcroppings with very sparse vegetation. The Inter-mountain Basins and Cliffs habitat is considered stable by Washington DNR (2015). Plants found in this habitat include serviceberry, netleaf hackberry, smooth sumac, western juniper, big sagebrush, antelope bitterbrush, curl-leaf mountain-mahogany, and ocean-spray. However, the Inter-mountain Basins Big Sagebrush Steppe habitat type is considered by Washing DNR (2015) as imperiled and consists of grasslands that contain stiff sagebrush, big sagebrush, rubber rabbitbrush, buckwheat species; the herb layer consists of arrow-leaf

balsamroot, bluebunch wheatgrass, lupine, fern-leaf biscuitroot, bulbous blue grass, and brome grasses.

The area where the upper reservoir would be constructed generally consists of rolling hills occupied by grasslands and shrub-steppe habitat types. Habitats in this area are mostly categorized as Columbia Plateau Steppe and Grassland with interspersed patches of Inter-Mountain Basins Big Sagebrush Steppe. Both habitat types are given a conservation status of "Imperiled (S2)" by Washington DNR (2015). The herb layer, where surveyed, consists of Hood River milk-vetch, nine-leaf biscuitroot, spiny phlox, curly blue grass, Idaho fescue, bulbous blue grass, spring draba, springbeauty, and bluebunch wheatgrass. The shrub layer consists of woody buckwheat species, wild rose, and rubber rabbitbrush. Small areas of Columbia Plateau Scabland Shrubland occur in mosaic with steppe and grassland habitats.

Noxious weeds are common throughout the project area. As noted above, they are prevalent around the lower reservoir and include Canada thistle (Klickitat County Class C noxious weed), dalmatian toadflax, rush skeletonweed, Russian olive, Himalayan blackberry, herb-Robert, and quackgrass (Klickitat County Class B noxious weed).

Special Status and Culturally Important Plants

There are 68 special status plant species known to occur in Klickitat County. FFP's 2019 survey identified five distinctive Rare Plant Habitats (RPH) in the project area that can support 15 state listed endangered, threatened, and sensitive species (table 3.3.4-2). The RPHs are associated with seeps and ephemeral streams that occur near the both the upper and lower reservoirs (RPH-1), steep south-facing talus and scree slopes between the upper and lower reservoirs (RPH-2, 3, and 4), and a wetland associated with a seep (Wetland 6) just above SR 14 (figures 3.3.4-2a and 3.3.4-2b). However, no rare plants were found during site surveys.

Plant gathering is an important subsistence and cultural activity that is documented in ethnographic literature and is still considered an important part of Yakama and other tribe's cultural identity today. Shellenberger et al. (2019) reports that a number of plants important to the Yakama Tribe occur in the project area, including smooth desert parsley, biscuitroot, and serviceberry (table 3.3.4-2).

Shellenberger et al. (2019) does not describe the cultural significance of the identified species or note whether the species are considered "food and medicine." However, Shellenberger et al. (2019) describes *Pushpum* (Juniper Point) as an important place for gathering roots and medicines. The report indicates that current use of the area in unknown but notes that there are reports of Indian tribal members gathering roots there "until the last 10–20 years."

Priority Habitats

To aid cities and counties in designating and protecting conservation areas, Washington DFW identified species and habitats for which special conservation measures should be taken. Priority habitats are habitat types or elements with unique or significant value to many species. A priority habitat may consist of a unique vegetation type like shrubsteppe, dominant plant species like juniper savannah, or a specific habitat feature like cliffs. Two priority habitat areas, mapped

by Washington DFW (2022a), occupy about 60 acres within the project boundary: John Day Talus Slopes, and John Day Cliffs. Talus slopes are homogenous areas of rock rubble ranging from 0.5 to 6.5 feet in diameter composed of basalt, andesite, and/or sedimentary rock, including riprap and mine tailings. These rocky talus slopes and cliffs provide nesting habitat for golden eagles, prairie falcons, and peregrine falcons, and provide roosting and hibernating habitat for bats and cover for small lizards and mammals. They also contain habitat for special status plant habitats and encompass two areas FFP identified as rare plant habitats (RP-2 and RP-4). However, the habitat quality of plant communities in the John Day Talus Slopes is reduced due to noxious weeds such as cheatgrass and Canada thistle.

Wetlands and Waterbodies

In May 2019, FFP (2020) delineated wetlands within the project boundary that could be affected by project construction (FFP, 2020). Water features located along the proposed transmission line ROW within project boundary would not be directly impacted by the proposed project and therefore were assessed using desktop methods. All wetlands and waterbodies identified in the project area are summarized in table 3.3.4-3 and shown on figures 3.3.4-3a and 3.3.4-3b. The six streams identified in the project area within Washington would have a water type classification of "Ns," which is defined as "streams that do not have surface flow during at least some portion of the year, and do not meet the physical criteria of a fish-bearing stream (Washington DNR, 2022); thus, they are all assigned 25-foot-wide regulatory buffers in accordance with Klickitat County Critical Areas Ordinance No. 0080613, Chapter III (Wetlands) (Klickitat County, 2003).

Of the identified wetlands, Streams 1, 7, and 8 are ephemeral streams that occur in the construction zone of the upper reservoir. These streams are small (12-24 inches wide), shallow (1-3 inches deep), and only carry water intermittently. Although no flowing water was observed during wetland surveys, evidence of flowing water was present (e.g., incised bed and banks, debris wracking, and algal matting on substrates). Two artificially created ponds to support cattle grazing (P-1 and P-2) are also located near the proposed upper reservoir. Seven other wetlands associated with drainages and seeps along SR 14 and on the CGA smelter site were also delineated. Wetland A is notable because it located within the construction area for the lower reservoir. Wetland A consists of 0.028-acre wetland that is hydrologically fed by a spring that has been piped to an overflowing livestock watering trough. Vegetation that has developed from the overflow is predominantly grasses and forbs. Site observations and a review of aerial photography indicates the wetland has seasonal hydrology. Wetland A has no surface connection to other wetlands or waters.

Wildlife

Habitats in the project area support a diverse assemblage of wildlife. Washington DOE (2022a) identified 150 species of birds, 38 species of mammals, and several species of reptiles and amphibians that either have been observed near the proposed project or are likely to occur based on known distributions. Birds observed in the project area include passerines, corvids, raptors, and upland game birds. Raptors observed in the project area include red-tailed hawk, American kestrel, golden and bald eagles, peregrine and prairie falcons, northern harrier, and ferruginous hawk. The cliff and talus slopes and shrub habitats near the upper reservoir provide

nesting and forging habitat for most raptors, and the developed areas with low-growing vegetation near the lower reservoir provide hunting habitat.

Washington DFW identified prairie falcons and nest scrapes both within and in the vicinity of the project (Washington DOE, 2022a). At least two historic prairie falcon scrapes have been documented to the southeast and northeast of the proposed project. In 2019, Washington DFW documented two adult prairie falcons displaying courtship behavior and confirmed a used scrape (territory/ Nest No. 288; Washington DOE, 2022a). Previous avian surveys in the vicinity of the project also identified peregrine falcon nests along the Columbia River but note that peregrine falcon breeding occurrence in Klickitat County was rare at the time of the surveys (WEST, 2003, 2006). Oregon DFW has also reported a peregrine nesting site across the Columbia River from the project.

There are no known bald eagle nests or communal roosts near the proposed project. The nearest known bald eagle nest is more than 10 miles downstream along the Columbia River (Washington DFW, 2016). Bald eagles have been observed wintering near the John Day Dam in the project vicinity although the nearest known winter roosts and feeding concentrations, as mapped by Washington DFW (Stinson et al., 2001), are downstream about 30 miles along the Columbia River, near the confluence with the Klickitat River. Bald eagles were observed near and within the proposed project boundary during studies conducted for nearby wind farms from 1994 to 2003 but were only present during winter and spring (December to May) and were thought to be migrants (WEST, 2006).

In Washington, breeding golden eagles are non-migratory and nest sites are typically used year after year, with the breeding pair maintaining an average of 2.7 nests in the territory (Watson et al., 2014a, 2014b). During bird surveys conducted from 1994 to 2003, golden eagles were observed in the project area during all seasons (WEST, 2006). According to Washington DFW (2022c), three golden eagle nests are known to exist on the cliff faces west of the project's lower reservoir. In addition, there are four historic nest locations to the east of the proposed project. Known golden eagle nest locations near the project boundary were surveyed by the Washington DFW in June 2013 and 2014. One hunting adult was present with an unrepaired nest (Washington DFW, 2014) in 2013 and 2014. Detailed analysis of home range use of a male golden eagle showed use largely within remaining open habitats including the proposed lower reservoir project area (Watson, 2015). Washington DFW resurveyed the John Day Dam territory in 2019. A defensive pair (adult and subadult) with an unrepaired nest was observed, however, other historic nest locations were not found (Washington DFW, 2019a). Bald eagles are not known to nest near the project

The Columbia River provides foraging and staging habitat for multiple waterfowl species. A PHS waterfowl concentration occurs located southeast of the project, in a side channel of the Columbia River just upstream of John Day Dam. The two existing stock watering ponds may provide some habitat for migrating and overwintering waterfowl from fall through spring when water is present; however, the ephemeral streams and wetlands lack ponded water, and thus do not provide suitable habitat for waterfowl for any extended period.

A variety of mammals likely occur in the habitats within the project boundary, including shrews, voles, deer mouse, northern pocket gopher, Great Basin pocket mouse, raccoon, weasels,

striped skunk, badger, coyote, bobcat, and mule deer (Washington DFW, 2021a; Washington DOE and Environment, 2006). Mule deer are a big game species of management priority in Washington State. They do not have any designated special status but are of cultural and economic importance, providing hunting and viewing opportunities that provide economic support to the state and to local communities. The project is within Washington DFW's East Columbia Gorge Mule Deer Management Zone. The project area is considered year-round mule deer habitat; a winter concentration habitat area is located northeast of the project in central Klickitat County. Mule deer are currently common in the project area and throughout much of eastern Washington.

Elk are also known to pass through the project area and are considered part of the Mount St. Helen's Elk Herd. The project is about 5 miles outside of the Mount St. Helen's Elk Herd Management Area (to the west) and about 50 miles outside the Yakima Elk Herd Management Area (to the north). Elk are expected to occur at low densities but may migrate through the project area.

Of the 15 bat species that occur in Washington State, 14 are expected to occur in Klickitat County (Washington DFW, 2021) and 11 were documented in surveys within 11 miles of the proposed project (Fleckenstein, 2001 as cited in WEST, 2006). Bat species documented near the project area include state candidate species Townsend's big-eared bat (Washington DFW, 2021). Resident species with a high likelihood of occurring within the project area include big brown bat, pallid bat, California myotis, and western small footed myotis (WEST, 2006). The migratory hoary bat and silver-haired bats have been documented near the project area and are expected to be most common in summer and fall (Washington DFW, 2021; WEST, 2006). Little brown bat, a state priority species, is documented in the project area. The silver-haired bat makes up nearly half of the reported bat turbine fatalities at Columbia Plateau wind energy developments (48%), with the hoary bat making up almost as many (46.4%), and the remaining fatalities from unidentified bat species (3.6%), little brown bat (1.3%), and big brown bat (0.7%) (WEST, 2010; 2011). Nearly all bat species found in Washington occasionally roost and hibernate in crevices found in rock fractures or talus slopes, which are prevalent in the project area. Small bodies of water such as ponds, streams, and wetland areas in and near the project area may provide water sources and attract foraging bats. The Columbia River and its tributaries are a potential water source for bats, as well as a landscape feature that may serve as a flyway. Although bats tend to follow linear landscape features (such as riparian areas) when commuting between roosting and foraging areas, little is known about their actual flyways, particularly during migration.

Washington DFW states that the Dalles sideband snail (*Monadenia fidelis minor*) and juniper hairstreak butterfly (*Callophrys gryneus*) could inhabit the project area, both of which are candidates for state-listing in Washington. The Dalles sideband snail is typically found in moist forested areas, but this subspecies does occur in drier habitats like talus and rock outcroppings in shrub-steppe habitats in proximity to springs, seeps, and riparian areas. However, even within these drier habitats, these snails appear to be associated with a water source, typically riparian areas, seeps, or springs. The juniper hairstreak butterfly occupies old fields, bluffs, barrens, juniper and pinyon-juniper woodlands, and cedar breaks. There is a historical record for the butterfly near the project in the Maryhill Museum. It is a WDFW Priority Habitat Species Candidate for state Endangered Species Listing and is a Species of Greatest Conservation Need

due to its rare and restricted hostplants [food for caterpillars (larvae)] and habitat types, small number of isolated populations, highly limited range and distribution, and threats to its habitat. It inhabits low to middle elevation shrub steppe where there are stands of juniper. Western juniper (Juniperus occidentalis), a short evergreen tree, is the species' most common hostplant. Juniper habitat has been expanding in some areas of the West due to factors including fire suppression and grazing, but habitat in the Columbia Basin has generally decreased due to wildfire, conversion of grasslands to agriculture, and wind and solar power development; however, pockets of protected habitat remain in dissected canyons and public land areas.

3.3.4.2 Environmental Effects

Effects of Project Construction and Operation on Vegetation

Project construction would result in the temporary disturbance of 54.3 acres of vegetation and the permanent loss of 193.6 acres (table 3.3.4-5). Permanent vegetation loss would occur from constructing the upper and lower reservoirs, substation, and improving access roads. Temporary disturbances to vegetation would occur from constructing laydown areas. Construction vehicles could transport noxious weed species to recently disturbed areas, potentially leading to increased competition with existing plant communities.

Most of the permanent vegetation loss occurs in Introduced/Invasive Annual Grassland (90.4 acres), Columbia Plateau Steppe and Grassland (49.6 acres) and Inter-Mountain Basing Big Sagebrush Steppe (40.8 acres). The temporary loss of habitat in construction laydown areas would include Columbia Plateau Steppe and Grassland (7.5 acres), Inter-Mountain Basins Big Sagebrush Steppe (8.1 acres), Columbia Plateau Western Juniper Woodland and Savanna (0.8 acre), and introduced/invasive annual grassland (37.1 acres) habitat types. Columbia Plateau Western Juniper Woodland and Savanna is considered a vulnerable habitat type and could be important for state-threatened western gray squirrels in the study area, but the amount temporarily lost would be small and no oaks were identified in the habitat.

To minimize effects on vegetation, FFP proposes to develop a Final Vegetation Management and Monitoring Plan in consultation with resource agencies that includes noxious weed management, protection of special status plants, revegetation of disturbed areas, and monitoring of revegetation. A draft of the plan was filed with the license application. Specifically, FFP proposes the following measures: (1) survey for federally listed plants and sensitive plant communities within the areas to be disturbed prior to land-disturbing activities, and, based on the survey results, limit construction-related disturbance of the communities by flagging or fencing off sensitive areas and designating specific areas for work and equipment movement; (2) survey for invasive species within areas to be disturbed prior to land-disturbing activities, and based on the survey results develop a comprehensive weed control plan that follows applicable guidelines and BMPs recommended by the Washington State Noxious Weed Control Board (e.g., training of project personnel to identify existing invasive weeds, treating existing infestations before maintenance activities occur, and cleaning machinery and other equipment prior to use to remove seeds and prevent the spread of weeds); and (3) hydroseed all temporarily disturbed vegetated areas with a native upland seed mix developed in consultation with Washington DFW and follow guidelines described in Benson et al. (2011). The goal of the revegetation effort would be to create sites with the following vegetation characteristics: an

established species assemblage similar to a reference ecosystem and that would provide an appropriate community structure; vegetation would consist of indigenous species to the extent practicable and capable of being self-sustaining, resilient, and reproducing populations.

FFP also proposes to monitor disturbed areas annually for compliance with vegetative performance standards specified in the draft VMMP for a minimum of 5 years or until those standards are met. Proposed performance standards are as follows: (1) by year 5, total percent cover of desired species (collectively) on disturbed areas will be greater than 70% cover of desired species in reference areas (for cut/fill areas, total cover of desired species will be >70%; no use of reference areas); (2) by year 5, at least 70% of total plant species must be either from the seed mix or plantings or from the plant species present in the reference areas or on the location prior to disturbance; and (3) percent cover of non-designated invasive weeds will not exceed the percent cover of weeds in the reference areas (monitoring to occur through year 5). Subsequent monitoring and maintenance would vary annually depending on the success of previous activities and the need for continued maintenance. If performance standards are not achieved within 5 years, monitoring and maintenance activities would continue until standards are met.

Interior's recommendations are consistent with the goals set forth in the proposed VMMP, but would modify the plan to include the following elements:

- The Washington DFW, Oregon DFW, Washington NHP, and FWS would be invited to participate in pre-construction surveys to assist in identifying botanical resources and to plan avoidance measures for construction and operation of the project.

- Pre-construction surveys of botanical resources would include both upland shrub-steppe and riparian areas since sensitive plants can occur in both habitats.

- Pre-construction plant surveys would be conducted twice prior to ground-disturbing activities, once early in the spring and once in mid-summer, to ensure that both early and late-blooming sensitive plants are observed.

- All sensitive plants would be documented, and disturbance would be avoided.

- The native seed mix would use locally adapted genetic materials.

- Resource agencies (Washington DFW, Washington NHP, Oregon DFW, FWS) would be consulted prior to replanting to confirm the appropriate seed mix. Shrub species and/or other species of traditional cultural importance would be added to the seed mix, depending on the results of pre-construction surveys and seed source availability.

- Supplemental plantings of containerized plants or bareroot nursery stock (including plants of cultural or spiritual importance) would be evaluated based on the results of pre-construction surveys and the availability of suitable source material. If it is determined to include containerized or bareroot nursery stock in the revegetation plan, these would be installed in the fall to maximize likelihood for successful establishment.

- All revegetated areas would be monitored annually for five years to ensure that native species have become established. If native vegetation does not become established or is overtaken by invasive species, areas would be re-treated and monitored for an additional five-year period.

- Any Class A noxious weeds detected in areas of previous ground disturbance and permanent features would be controlled using appropriate mechanical, biological, and chemical treatments that meet the requirements of state and Federal law. Control of weeds would follow Integrated Pest Management, which includes helping prevent weed problems, monitoring for the presence of weeds, treating weed problems, and evaluating the effects and efficacy of weed control treatments.

- Fire suppression measures during construction and operation would be implemented to minimize potential damage to wildlife habitat.

EPA also recommends that surveys be conducted in the project area as part of the impact analysis to identify flora present.

Our Analysis

Because the powerhouse, penstock, and access tunnels would be constructed underground, effects of vegetation and sensitive plant communities would occur primarily from constructing the upper and lower reservoirs, and laydown areas. The lower reservoir is in an area that has been previously disturbed by construction of a smelter and is heavily colonized by invasive species; therefore, the site represents lower quality habitats than those associated with the upper reservoir and is not likely to support sensitive and rare plants.

Although the habitats in both the upper and lower reservoir areas are not high-quality habitats due to the presence of invasive species and development (wind turbines, smelter), constructing the reservoirs would remove or disturb some habitats that are considered vulnerable by the state and could contain federal and state listed sensitive and rare plant species (e.g., California broomrape, smooth desert parsley, Douglas' draba, and hot-rock penstemon). FFP's surveys identified areas that could support these plants; however, its surveys were not conducted during times when some species would have been identifiable. FFP states it would survey areas that would be disturbed during construction, which includes both the upland and riparian areas. However, FFP's draft plan does not specifically describe when or where it would conduct its proposed plant surveys. Conducting pre-construction surveys for federal and state listed plants in both upland shrub-steppe and riparian areas during the spring and early summer as recommended by Interior would improve the chances of detecting any rare species and developing potential measures to avoid or mitigate impacting the species, such fencing off the plant communities or transplanting any identified plant species to safe and suitable habitats.

Confining construction areas and activities as narrowly as possible, avoiding ground - disturbance in riparian, wetlands, and sensitive areas, and revegetating disturbed areas as soon as possible after completing construction as proposed by FFP and recommended by Interior would minimize vegetation loss, preserve soils, help recover vegetation, minimize the introduction of weeds, and promote development of habitats important to wildlife. The seed mix proposed by

FFP includes grasses and forbs used locally by the USDA Forest Service at the Columbia River Gorge National Scenic Area that are known to provide good soil cover, prevent erosion, and are used by wildlife. However, including other species such as shrubs or other species of traditional cultural importance in the planting mix (e.g., juniper, yarrow, *Lomatium* spp., *Eriogonum* spp., Juniper, and serviceberry) if they are available as suggested by Interior could further improve habitat for wildlife (e.g., forage, cover), offset the loss of culturally important plants, and better achieve the revegetation goals of establishing self-sustaining, resilient, reproducing populations. Finalizing the seed and planting mix based on site surveys and seed mix availability and in consultation with the resource agencies and tribes as proposed by FFP and recommended by Interior would provide a more informed planting decision and improve the likelihood of achieving the revegetation goals.

As noted previously, invasive species are abundant in the project area. Invasive species reduce the quality of existing habitats and often out compete native vegetation. Taking steps to prevent the spread of invasive species, such washing equipment before moving between the upper and lower reservoir areas as proposed by FFP and developing a control plan based on site surveys, would minimize the spread of invasive species. A variety of techniques can be used to control invasive species, including mechanical, biological, and chemical treatments. The appropriate treatments depend on the identified species. Following an Integrated Pest Management approach as recommended by Interior could lead to a more judicious use of herbicides by integrating other biological or cultural management options, as opposed to focusing on a single control option. However, to be effective, continued control in the areas of disturbance would be needed until the sites are recovered.

FFP's monitoring program would provide a means to track and verify reestablishment of native vegetation. The proposed monitoring plan includes specific metrics to evaluate the successful germination and reestablishment of disturbed areas, photo documentation of the monitoring results, and reporting. Establishment of native plants that would provide more permanent and ecologically functional plant communities will take time, but successful reestablishment of native vegetation could be accomplished within the 5-year monitoring period if there are no extreme weather conditions (e.g., drought). If annual monitoring indicates that successful revegetation has not been achieved, FFP's monitoring and maintenance activities (e.g., soil amendments, plantings, and weed management strategies) would continue until standards are met.

Wildfire control is not proposed in FFP's management plan. The arid environment increases the potential for wildfires during clearing and grubbing for project construction, which would create slash that could build up concentrations of combustible material that could fuel wildfire. Developing protocols for preventing and controlling wildfires during project construction and operation, including promptly removing slash and maintaining appropriate clearances along the project transmission line right-of-way, would help to protect terrestrial and other resources.

FFP's proposed Vegetation Management and Monitoring Plan would minimize adverse effects on vegetation and sensitive plants, thus project construction and operation are not expected to result in a significant adverse effect on vegetation and sensitive plants.

Effects of Project Construction and Operation on Wetlands and Waterbodies

As discussed in section 3.3.4.1, nine wetlands and waterbodies were identified in the project area. Of these, constructing the proposed project would result in the loss of all of Pond/Wetland P2 (0.027 acre) and a portion of Wetland A (0.015 acre). Neither is considered by the state to be a critical area that requires protection or mitigation.

Construction of the upper reservoir would result in the filling and loss of approximately 0.041 acre (890 linear feet) of ephemeral Stream S7, approximately 0.003 acre (75 linear feet) of ephemeral Stream S8, and approximately 0.004 acre (775 linear feet) of ephemeral Stream 1 (see figure 3.3.4-4b). The total permanent stream impacts would be 0.048 acre. Approximately 0.037 acre of Stream S8 would be temporarily disturbed due to its location within the temporary construction staging area. All streams in the project area have a state regulatory buffer of 25 feet, some of which would be directly affected by construction of the proposed project. The buffer areas around Stream S7, Stream 1, and a small portion of Stream S8 would be lost (table 3.3.4-7). No wetlands were identified in association with these streams in that none support hydrophytic plants. Observed soil conditions are consistent with an ephemeral or intermittent hydroperiod that likely occurs only during infrequent flow events after heavy precipitation and appears to support a very limited time for saturation or standing water and soils. Because no ground-disturbing work would occur in the proximity to the Columbia River, riparian communities along the river and the small tributary streams located along the proposed transmission line ROW would not be directly impacted by the proposed project.

To mitigate the effects on streams S1, S7, and S8 and ensure that construction does not cause changes to downstream wetland functions, FFP proposes to implement a Wetlands Mitigation and Planting Plan as part of its water quality certification application that would be finalized during final project design. FFP's wetlands plan includes (1) evaluating the viability of establishing and rehabilitating a new stream course on-site at 1:1.1 ratio; (2) using BMPs to control erosion to avoid and minimize impacts to downstream riparian or amphibian habitat; (3) revegetating disturbed areas with a native seed mix; (4) use appropriate construction management to minimize the spread of invasive weeds; and (5) monitoring revegetated areas for a minimum of 10 years until specified performance standards are met for vegetative cover, species composition, and invasive plants.

Because streams S1 and S7 have limited hydroperiods and do not provide wetland or riparian functions, but rather act to direct overland flow through a channel to downstream locations which may provide additional functional wetland qualities, FFP proposes to evaluate the viability of redirecting surface water from these streams so that downstream habitats maintain pre-construction amounts of flow. If there is a viable location to construct a new stream course, one would be constructed that provides the same length and width of the impacted drainage, with the goal of capturing a similar portion of hilltop precipitation runoff and providing matching functional resources. The new drainage would follow natural topography to the extent possible, while providing for slight meanders, softening bank grades, in-stream structures to slow flow, and changes in depth to prevent down cutting. If construction is necessary, the established drainage would be seeded and/or planted with grass and forb species like those in the area impacted, or those having greater functional value depending on the location. In the case of stream S8, impacts to the drainage are expected to be temporary and offset by rehabilitating the

drainage following construction activities. Following the completion of project construction, all temporary fill materials and underlying geotextile fabric would be removed and a post-construction survey would be performed to determine which construction methods will be most appropriate for rehabilitation of channel functions.

No entity recommended any measures to mitigate the effects on these streams in response to the Commission's REA notice.

Our Analysis

Constructing the upper reservoir would result in the loss of 1.443 acres of ephemeral streams and associated stream buffers. FFP's proposed project design avoids impacts to wetlands to the extent practicable. FFP's proposed wetland mitigation measures further minimizes adverse effects on streams and wetlands by establishing and rehabilitating a new stream course if possible and using construction BMPs to minimize adverse effects on downstream wetland functions and aquatic habitats. Because of the small area affected by project construction and their location in the headwaters, effects on these streams would be minor and adequately offset by the measures proposed in FFP's Wetland Mitigation and Planting Plan.

Other streams (S2, 17 and S24) and wetlands (W6) located near the area of the lower reservoir are not addressed in FFPs Wetland Mitigation and Planting Plan. Based on wetland delineations conducted by ERM in 2019 and 2022, these streams and wetlands are not jurisdictional waters of the US. Further, these streams and associated wetlands are not located near any proposed construction activities and are not within the footprint of the project penstock and tunnels; therefore, the project will not have any direct or indirect effects on these waterbodies or wetlands.

The areas identified as Wetland A and a small portion of Wetland B are located with the laydown area for the construction of the lower reservoir. ERM (2022) determined that these areas were not wetlands because of the lack of hydric soils and hydrology and thus not jurisdictional. These areas have been influenced by cattle grazing and the presence of invasive species. The filing of Wetland A (0.015 acre) and the temporary indirect effects on Wetland B from constructing the lower reservoir would be minimal as these areas do not appear to provide any important wetland functions.

Project maintenance activities would not involve any land disturbance and the reservoirs and tunnels would all be lined with an impermeable material, which would minimize effects to surface and groundwater hydrology. Therefore, project operation and maintenance are not expected to affect wetlands and waterbodies, and their buffers

Effects of Construction on Wildlife

Construction of the project would require the use of heavy equipment to clear vegetation, construct the upper and lower reservoir, improve existing access roads, and drill the penstocks and tunnels. As noted earlier, 193 acres of vegetation in various vegetative communities would be disturbed and about 54 acres would be revegetated following construction. Some blasting is also likely to be required to remove bedrock to construct the reservoirs and the use of helicopters

may be needed to move equipment. Noise from construction activities and construction vehicles would displace more mobile wildlife to less desirable habitats and could result in the death of some less mobile wildlife (e.g., amphibians). Of particular concern are the disturbance effects of the construction activities on golden eagles, peregrine falcons and bald eagles that are known to forage, nest, and roost near the project. Disturbances during nesting could displace birds into less suitable habitat and thus reduce survival and reproduction. Light pollution can affect migrating and nocturnal birds through disorientation, as well as breeding behavior and reproduction of songbirds (Cabrera-Cruz et al. 2018; Wiltscko et al. 1993; Kempenaers et al. 2010).

To minimize construction effects on wildlife, FFP proposes in its draft Wildlife Management Plan to: (1) conduct 2-years of pre-construction surveys (two nesting surveys from February 1 to April 30 and third survey from June through first week in July to evaluate productivity) to document bald eagle, golden eagle, and prairie falcon nesting and bald eagle roosting sites (between December and February) within 1 mile of the project, develop appropriate spatial and temporal restrictions on construction activities based on the results of the surveys (e.g., avoiding on or near-surface blasting and helicopter use within 0.25 to 1 mile of an active nest, depending on the species), and monitor any documented nests in accordance with FWS recommendations to ensure construction activities avoid disturbing the nests;[42] (2) conduct a training program to inform employees of sensitive biological resources such as raptor nests or roosts; (3) flag the limits of the construction zone to avoid sensitive areas designated for preservation; (4) employ a biological monitor during construction to check construction sites to ensure that fencing is intact and sensitive areas (e.g., high-quality native plant communities, cliff or talus habitats) are not disturbed and that any open pits are covered or fenced at night to prevent wildlife from falling into the pits; (5) limit construction activities to the hours of 8:00 a.m. to 6:00 p.m. to avoid disrupting crepuscular and nocturnal wildlife; (6) apply dust palliatives or suppressants to unpaved roads to reduce dust that would adversely affect wildlife habitat; and (7) implement a project vehicle speed limit to reduce wildlife collisions. To mitigate for the permanent loss of wildlife habitat, FFP proposes to work with FWS and Washington DFW to select and purchase 277 acres[43] off-site land and manage the land to provide golden eagle nesting and forging habitat. The lands would be in an area of known golden eagle and prairie falcon nesting habitat and would provide forage species that benefit these birds.

Interior recommends (Interior 10(j) recommendation 3) the development of an avian protection plan (APP) that includes conducting pre-construction surveys for birds, nests or roosts and establishing buffers for construction activities. The APP would also include other protective measures that address constructing transmission structures according to bird protection standards and guidelines, adjusting lighting systems to minimize disruption of nighttime foraging, and marking fencing around the project reservoirs to prevent avian collisions. These measures are

[42] Survey methods would follow Washington DFW survey guidelines, in consultation with WDFW and USFWS area biologists as well as guidance provided in Pagel et al. 2010 and Watson and Whalen 2004.

[43] Acreage is based on a ratio of 2:1 acres for permanent loss of habitat for the upper reservoir (92.36 acres) and a ratio of 1:1 for the loss of habitat for the lower reservoir (91.8 acres) because of its poorer habitat quality.

addressed further below under *Effects of Project Operation* and *Effects of the Project Transmission Line*.

In addition, Washington DFW recommends the development of a management plan for the conservation of the golden eagle mitigation lands. This plan would be approved by Washington DFW and FWS and be updated every five years to reflect new information, new management needs, and updated implementation strategies. The lands would be in an area of known golden eagle and prairie falcon nesting habitat and would provide forage species that benefit these birds. The mitigation plan would include measures to control noxious weeds, manage public access to avoid disturbing raptors, wildfire mitigation measure such as replanting of burned areas with native species, fencing to protect and improve the habitat, and development of a wildlife water guzzler if there is an identified need for a source of water for wildlife. EPA recommends the development of detailed steps that would be used to ensure that the proposed 277 acres for mitigation is adequate to offset the potential impacts from the project, as well as the plan to acquire, manage and maintain the mitigation area over time.

Our Analysis

Construction activities, including drilling, blasting, earthwork, and concrete laying, would occur over about 5 years. During this time, localized noise and human activity would likely disturb and displace more mobile wildlife (e.g., deer) to other nearby habitats until construction activities cease. Effects on deer are not expected to be significant because no portion of the project area is classified as mule and black-tailed deer winter range (WDFW 2018a) and activities would be conducted during daylight hours when deer activity is likely less.

Although the project area has experienced significant development (e.g., wind farms, a decommissioned aluminum smelter, John Day dam), which has reduced habitat quality for golden eagles, it still provides suitable nesting and foraging habitat. The project site overlaps with the John Day Dam golden eagle territory, which contains one active and two historical golden eagle nests. The three historic nest sites occur west of the proposed lower reservoir on the cliff face between the proposed reservoirs. Prairie falcons are also known to nest on the steep bluffs between the proposed upper and lower reservoirs. Peregrine falcons are known to nest across the Columbia River in Oregon. Bald eagles have been documented flying through the area. Given the proximity of potential nesting and foraging areas to the construction sites, it is likely that project construction could disturb nesting golden eagles and falcons. The degree of sensitivity to disturbance would depend on the species, nest situation and habitat characteristics, the stage of breeding cycle, the type of disturbance, and the individual bird (Richardson and Miller, 1997, Pagel et al., 2010). Project activities that disturb golden eagles could cause them to exhibit agitation and vigilant behavior, change their foraging and feeding habits, and abandon nests (Pagel et al., 2010). Washington DFW has observed non-viability, poor recruitment, low-territory occupancy, and mortality of golden eagles due to wind development in the John Day Dam area (Watson 2019). The critical breeding period for Washington's golden eagles begins with courtship in early January and ends with juvenile dispersal in mid- to late-August (Pagel et al. 2010; Watson and Davies 2009). Washington DFW management guidelines indicate that avoiding disturbance is especially important during the nesting period of 15 February to 15 July (Watson and Whalen 2004). Additional disturbance during project construction could further reduce recruitment in the John Day Dam golden eagle territory.

Less is known about disturbance effects on nesting prairie falcons. Washington DFW management recommendations for prairie falcons (Hayes and Dobler 2004) indicates homes and other human activity should be placed no closer than 2,640 ft from prairie falcon nest sites to avoid nest abandonment (Hays and Milner 2004). For nesting peregrine falcons, Hayes and Milner (2004) recommends that facilities not be established within 0.25-0.5 mi of the eyries and that human access along the cliff rim above a nest site should be restricted within 0.5 mile of the nest from March through the end of June. Human activities on the face of, or immediately below, peregrine nest cliffs should be restricted from 0.25-0.5 mile of the nest during nesting (Hayes and Milner 2004).

Conducting 2-years of pre-construction surveys to document bald eagle, golden eagle, prairie and peregrine falcon nesting and bald eagle roosting sites (between December and February) within 1 mile of the project would allow FFP to plan its construction activities to minimize disturbing nesting raptors. Implementing FFP's proposed mitigation measures (e.g., appropriate spatial and temporal restrictions on construction activities based on the results of the surveys, flagging sensitive areas, limiting construction period to daylight hours, applying dust palliatives, avoiding blasting and use of a helicopter within 0.25 to 1 mile of active raptor nest, and limiting construction vehicle speeds) would avoid and minimize construction effects on wildlife and sensitive habitats to the extent practicable.

Acquiring and managing 277 acres of off-site lands for the benefit of golden eagles would offset the permanent loss of eagle foraging and nesting habitat at the project if the acquired lands are close and provide similar or better habitat conditions. FFP is working with Washington DFW and FWS to identify suitable lands and would select parcels based on the following criteria: the parcels would include a golden eagle nest and/or foraging habitat within 6 km of a known nest, exhibit a mix of foraging habitat characteristics such as topographic variation (big cliffs or slopes) and lower elevations intermixed with ponderosa pine, and ideally would be located adjacent to WDFW lands. FFP suggests that there are such parcels close by in Klickitat County.

Until the parcel(s) are identified, and the habitats evaluated, it is not possible to determine what specific habitat management would be needed on the land to achieve its intended purposes. However, it is likely that some habitat management will be required. Based on our understanding of the lands surrounding the project this could include controlling noxious weeds, managing public access to avoid disturbing raptors, wildfire mitigation measures such as replanting of burned areas with native species, fencing to protect and improve the habitat, and development of a wildlife water guzzler if there is an identified need for a source of water for wildlife as recommended by Washington DFW. Consequently, a management plan for the parcel(s) would need to be developed after it is identified. The plan would need to identify the parcels to be acquired, the habitat values of the land, and the habitat improvements that would be implemented on each parcel.

Effects of Project Construction on Dalles Sideband Snail and Juniper Hairstreak Butterfly

In its comments filed in response to the Commission's ready for environmental analysis notice, Washington DFW recommended for the first time that FFP conduct pre-construction

surveys for Dalles sideband snail (*Monadenia fidelis minor*) and juniper hairstreak butterfly (*Callophrys gryneus*). Washington DFW did not specifically recommend these surveys pursuant to section 10(j). Washington DFW states that it only recently became aware that these species may be present in the area.

FFP did not address these species in the application or respond to Washington DFW recommendation.

Our Analysis

Habitat for both species could be affected by constructing the upper reservoir. Performing a survey for both species prior to beginning construction would determine if they are present and inform the need for any additional protective measures, such as flagging to prevent disturbance, potentially relocating affected species, or revegetating disturbed areas with suitable plants.

Effects of Project Operation on Raptors, Bats and Other Wildlife

Project operation would increase noise, light, and human presence in the project area, which could disturb some sensitive wildlife. Noise would be generated from periodic vehicle movement and temporary use of heavy tools and equipment but would be of short duration and localized. Given the arid character of the project area, the project reservoirs could attract wildlife for loafing, resting, foraging and as a source of water. This could expose wildlife to drowning if they could not climb out of the reservoirs. Increased attraction to the open water could expose bats and raptors to increased mortality from nearby wind turbines.

As part of its draft Wildlife Management Plan, FFP proposes to minimize adverse effects on wildlife during project operations by (1) use directional lighting to manage light pollution that could disorient migrating and nocturnal birds; (2) install a chain link fence that is at least 8 feet high around the reservoirs to prevent animals from gaining access to the reservoirs; (3) mark all fences with vinyl strips and/or reflective tape to reduce avian collision risks; (4) prevent the establishment of vegetation around the reservoirs to reduce their attraction to wildlife; (5) cover the reservoirs surface with floating plastic shade balls to reduce the open-water habitat that could attract waterfowl, water birds and other raptor prey species; (6) monitor for and remove carcasses of livestock and other animals from the project area that may attract scavenging wildlife, foraging eagles, or other raptors; (7) develop a monitoring program to identify bird and mammal usage of the reservoirs and measure the effectiveness of wildlife deterrents; and (8) develop an reporting system to document wildlife mortalities, injuries, nuisance activity, and other interactions.

Washington DFW is supportive of the FFP's draft Wildlife Management Plan and recommends that it be a requirement of the new license. However, Washington DFW believes that the proposed reservoir deterrent effectiveness monitoring could be improved by including pre- and post-installation monitoring. Therefore, Washington DFW's 10(j) recommendation 2 recommends that, as a component of WMP, a bird and bat reservoir deterrent management plan (Wildlife Deterrent Management Plan) be developed in coordination with Washington DFW, FWS, and the Yakama Nation. The objective of a Wildlife Deterrent Management Plan would

be "no net increase of birds and bats in the upper and lower reservoir areas for the time period prior to reservoir construction compared to post construction. The plan would, in addition to measures currently included in the draft WMP and FLA, include, but not be limited to the following elements: (1) measures to deter birds and bat from using the reservoir, and (2) monitoring of bird and bat use of the reservoirs before and after deploying deterrents. Deterrent methods could include shade balls and acoustic bat deterrents, but other deterrent methods would also be considered. Acoustic monitoring would be performed year-round to monitor bat species and when they use the reservoir areas. Point count surveys would be used to monitor bird species and when they use the reservoirs. Then, monitoring information would be used to decide to maintain, increase, modify or explore other options of deterrents." A Wildlife Deterrent Management Plan annual report would be required that (1) identifies methods used to deter birds and bat use of the reservoirs, (2) whether the methods are successful in achieving the objective of the Wildlife Deterrent Management Plan, and (3) future deterrent measures needed if the objective is not achieved. Washington DFW, FWS, and the Yakama Nation would be provided thirty (30) days to comment and review the annual report. FFP address the comments in the annual report, which would be due to the Commission on May 1.

As noted above, Interior recommends (Interior 10(j) recommendation 3), that FFP include in an APP a requirement to adjust lighting systems to minimize disruption of nighttime foraging and to mark fencing around the project reservoirs to prevent avian collisions.

TID also expressed concern that the presence of the reservoirs would increase the number of eagle strikes at its wind farm. TID recommends that a study be conducted to establish baseline, pre-construction data regarding average golden eagle strikes over the past 25 years. Then, prospectively, for the life of the surrounding wind turbines, an annual study would be performed to determine whether the proposed project is causing an increase in golden eagle strikes, when compared to the baseline data.

Our Analysis

Noise and Lighting Protective Measures

The project would increase noise, lighting, and human activity over existing conditions. FFP expects that background noise levels would not be elevated beyond 500 feet from the project's infrastructure (FFP, 2020). Most of the project facilities would be underground; therefore, most lighting likely would be associated with security features. Minimizing the number of outside facility lights and using directional lighting would minimize the amount of light pollution and adverse effects on nocturnal and migrating birds.

Some wildlife may be permanently displaced from habitats immediately adjacent to the project because of changes in habitat and elevated human activity; however more tolerant species would likely become habituated over time to the industrial activities. These indirect impacts on terrestrial habitat would not result in a significant adverse impact because ongoing or repeated disturbance of habitat that is critical to species viability would not occur.

More sensitive species, such as prairie falcons and golden eagles, may be permanently displaced from nesting on the cliffs between the upper and lower reservoirs. For example, a

study of prairie falcons in Oregon found that most suitable scrapes, or nest sites, are located more than 0.5 mile from human habitation (Larsen et al. 2004). Richardson and Miller (1997) suggested spatial buffer zones for prairie falcons range from 164 feet to prevent post-fledging visual disturbance to 0.5 mile for noise disturbance. Thus, the prairie falcons that nest within the project area could potentially abandon the site. For golden eagles, FWS (Pagel et al., 2010, cited from Boeker and Ray, 1971) reported that human disturbance accounted for at least 85% of all known nest losses. Types of human activity that may disturb eagles include visual disturbance (i.e., the ability of the raptor to see humans), audible disturbance such as shouting, and direct physical disturbance such as during some types of outdoor recreation. Over time, the combined effect of project construction and periodic disturbance during operations could cause cumulative stress resulting in permanent behavioral disruptions for golden eagles and falcons.

Measures to Reduce the Attraction of the Reservoir to Mammals

Except for small rodents, reptiles, and burrowing animals, which might pass through or dig underneath the fence, an eight-foot-tall chain link fence should be adequate to exclude wildlife from the project reservoirs, which would prevent drowning. FFP proposal to monitor fences weekly, weather permitting, and to repair any damage as soon as practicable would ensure that the fences are maintained, and wildlife continue to be excluded from the reservoir. Marking the fencing with vinyl strips and/or reflective tape would make the fences more visible to birds and would reduce avian collision risks with the fence. Screening would also reduce the visibility of the reservoirs to raptor prey, such as deer fawns.

FFP did not provide any details on its proposed monitoring program to identify mammal usage of the reservoirs and to measure the effectiveness of the selected deterrents. However, if the effectiveness monitoring shows that the deterrents were not effective, FFP states it would consider additional measures such as physical barriers and low current shocking wires and strips. FFP's proposed weekly fence monitoring should be sufficient to determine if any animals are passing through the fence and drowning in the reservoirs. The additional measures proposed by FFP could further deter animals that may attempt to climb the fence, but given the height of the fences, we do not anticipate that this will be necessary.

Measures to Reduce the Attraction of the Reservoirs to Birds and Bats

Two primary concerns have been raised with respect to constructing the upper and lower reservoirs. First, it has been suggested that the new reservoirs may alter laminar wind flow patterns because of changes in topography, moisture, and temperature, which could in turn make navigating the wind turbines more difficult for golden eagles and other raptors. Second, the new reservoirs would create 124 acres of open water habitat that would attract waterfowl and water birds which are prey for golden eagles and other raptors. The new reservoirs would also provide a source of water and prey for foraging bats. The attraction to the reservoirs could expose golden eagles to increased mortality from wind turbine strikes and bats to increased mortality from strikes and barotrauma.

FFP conducted a Wind Resource Effects Analysis to evaluate the effects of the project reservoirs on wind patterns. The analysis used a meteorological model that considered wind direction, wind speed, and turbulence under existing conditions and during project operation

based on the current proposed upper reservoir design.[44] The upper reservoir would be constructed in the middle of TID's wind farm. Two turbines (17A and 17b) are located immediately east and downwind of the proposed reservoir, 11 others are located further east, and two are located west of the upper reservoir (figure 3.3.6-1). The analysis showed a modest effect of the proposed reservoir on wind speed, wind direction, and turbulence, as expected, but that these effects were minimal or non-existent at the height and location of the wind turbines. At 262 feet above the reservoir, the approximate height of the nearby wind turbine towers, the turbulence directly over the upper reservoir increased up to 32.3 feet^2 per second^2. The analysis concluded that, based on this small change in turbulence, there would be negligible changes to air flow patterns (ERM, 2021b). Therefore, construction of the reservoirs should have little to no effect on eagle and other raptor's ability to navigate the wind patterns around the turbines above those already experienced by the raptors.

While the project site does not currently provide suitable habitat to attract waterfowl (West 2006, 2008), the nearby Columbia River and the John Day Waterfowl Area supports abundant waterfowl. Waterfowl are important prey for golden eagles, bald eagles, and peregrine falcons (Marzluff et al., 1997; Hunt, 2002; Crandall et al., 2015). Based on past studies at the wind farms in the project area, bats are also known to forage around the wind turbines. Bats could be attracted to the aquatic insects that colonize in the reservoirs which could increase the risk of collision with nearby wind turbines. Therefore, it is reasonable to conclude that golden and bald eagles, falcons, bats, and other wildlife are likely to be attracted to the project reservoirs if FFP's proposed deterrents (use of shade balls, alteration of shoreline habitat to reduce the quality of habitat) are not successful. There is precedent for using shade balls to discourage birds from using waterbodies. Plastic shade balls have been used to prevent birds from identifying airport ponds as water sources and from landing on the ponds to prevent bird collisions with planes.[45] With the shade balls in place, birds apparently do not recognize the reservoir surface as water. The balls have the added benefit of reducing evaporation and preventing algal growth.

FFP proposes to monitor bird usage of the reservoirs and measure the effectiveness of bird deterrents; however, FFP does not propose any monitoring methods. FFP states that other protection measures would be used such as hazing if the deterrents were not effective in preventing birds from using the project reservoirs. Counting bird use before and after constructing the reservoirs and installing the shade balls as recommended by Washington DFW and Interior would provide a means to determine if there was a change in bird use. Taking steps to deter waterfowl and other raptors from using the project reservoirs is prudent, particularly for golden eagles since the number of golden eagles in John Day dam population appear to be declining and because wind energy development has been implicated as a factor in the decline of

[44] The upper reservoir is the closest to the existing wind turbines and thus should have the greatest effect on wind patterns and subsequent effects on eagle susceptibility to wind turbine strikes.

[45] See https://euro-matic.eu/hu/en/references/offloading-bird-balls-at-brussels-airport/#:~:text=In%202016%2C%20following%20a%20decision%20by%20flight%20safety,runways%20to%20reduce%20the%20risk%20of%20bird%20accidents. Also, see https://bird-x.com/bird-products/bird-balls/.

golden eagles in Washington (Watson et al., 2020, FWS 2015). However, an increase in bird use and risk does not necessarily indicate an adverse effect that requires further deterrents because interacting with adjacent wind turbines does not necessarily mean that injury and mortality events are inevitable. TID notes that their wind farm has experienced only one golden eagle strike since it was commissioned in May 2009. Further, no one has suggested what other deterrents might be effective at reducing bird use of the reservoirs, except FFP's proposed hazing. The use of hazing as suggested by FFP could cause hazed birds to fly more erratically increasing the potential for the birds being struct by the two adjacent wind turbines' blades.

Therefore, if bird use increases, further monitoring of avian interactions with the adjacent wind turbines would be needed to determine if there would be a significant adverse effect on golden eagles and other birds. This could require bird fatality searches both before constructing the project reservoirs and after installing the shade balls using methods like those described by Smallwood and Karas (2009). However, access to lands outside the project boundary would be needed to conduct the searches and such access would require permission from the landowner.

Although floating shade balls may effectively deter birds, it is unknown whether they would deter bats. The current use of the project site by bats and the current mortality rates of bats from the wind turbines is unknown. FFP does not propose to monitor bat use of the reservoirs or deploy additional deterrents if bat use increases. Bats appear to be attracted to wind turbines for a variety of hypothesized reasons, including auditory, heat, and insect abundance.[46] However, the reasons for such attraction are not known. A study of insect abundance and bat activity at three wind turbines in South Sweden, showed a weak but significant positive relation between bat activity and insect abundance; so, the hypothesis that bats are attracted to wind turbines because of feeding could not be rejected, suggesting there might be factors other than insect abundance explaining the frequency of bat visits at the turbine nacelle (de Jong et al. 2021).[47]

Year-round acoustic monitoring of bat use prior to constructing the reservoir and after installing the shade balls as recommended by Washington DFW would allow FFP to determine if bats are attracted to the reservoirs by nighttime insect activity, water, or other factors, and whether the proposed use of floating shade balls is effective in deterring bat foraging above the reservoirs. If monitoring shows that bats are attracted to the reservoirs, then implementation of bat deterrent measures (e.g., acoustic deterrents such as those used at wind farms) may be needed. However, some measure of bat fatality rates before and after project construction would be needed to determine if the rate of mortality increases and is significant enough to require further mitigation measures. Conducting bat mortality searches such as those done by Smallwood and Karas (2009) would aid in that determination. Again, access to lands outside the

[46] Why Bats Are Insanely Attracted To Wind Turbines? (electrical-engineering-portal.com).

[47] A nacelle is the part of the wind turbine that consists of a generator, low- and high-speed shafts, gearbox, brake, and control electronics. It is connected to the tower through a yaw control mechanism.

project boundary would be needed to conduct the searches, and such access would require permission from the landowner.

Therefore, an effective monitoring plan would need to include methods for documenting bird and bat use before and after installing the project, metrics for evaluating the effectiveness of the deterrents in reducing the attraction of the project reservoirs by birds, bats, and other wildlife, and criteria for deciding whether additional deterrents or modifications to the project are needed.

Avian Protection Measures Associated with the Proposed Transmission Line

The project would require constructing a 3.13-mile-long, overhead 500-kV transmission line. The overhead line would be located within the existing BPA right-of-way and would use existing BPA structures. The transmission line would be routed from the project substation/switchyard south across the Columbia River and connect to BPA's existing John Day Substation. Additionally, two non-project distribution lines would be relocated around the south side of the lower reservoir. This would require a new approximately 5,600-foot-long alignment for both lines, the relocation of five to six wooden H-frame towers, and nine to ten single pole structures.

Many birds, especially raptors, select power poles for perching and sometimes for nesting. Raptors and other large birds can be electrocuted if they simultaneously contact two energized conductors or an energized part and a grounded part. In addition, collision with the transmission lines may result in avian injury or mortality.

To minimize avian electrocution and collision hazards with the project transmission line, FFP proposes in its draft Wildlife Management Plan to ensure that the transmission line is sited on the existing poles so that appropriate clearance between energized conductors or between energized conductors and grounded hardware is applied (i.e., 40 inches or more of vertical clearance and 60 inches or more of horizontal clearance between energized conductors or energized conductors and grounded hardware). If the existing transmission lines already have visibility enhancement devices installed, no new ones will be added. If no visibility enhancement devices are on the existing lines, then FFP would install appropriate devices after consultation with USFWS and WDFW. Any new poles and lines will be designed with appropriate conductor spacing and visibility enhancement devices.

Interior recommends (Interior 10(j) recommendation 3) that an APP be developed that requires constructing transmission structures according to bird protection standards and guidelines. The APP would include adequate insulation, and any other measures necessary to protect raptors from electrocution hazards. Any power pole involved in a bird fatality would be retrofitted or rebuilt to increase safety for large perching birds. In addition, all new or rebuilt power poles would be constructed in accordance with guidelines in the publications, or the most current editions of these publications, entitled "Avian Protection Plan Guidelines" (APLIC, 2005) which is intended to be used in conjunction with "Suggested Practices for Raptor Safety on Power Lines: The State of the Art in 1996" (APLIC, 1996) and Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Further, bird flight diverters would be installed on any new transmission lines and existing transmission lines would be retrofitted that have been documented to cause mortality or have a high likelihood of causing mortality. The licensee

would conduct operation and maintenance activities in the project area in accordance with the most current spatial and temporal guidelines for avian protection (APLIC, 1996, 2005 and 2012).

Our Analysis

Bald eagles and other large birds occur in the project area. Avian collision studies have demonstrated that birds can avoid powerlines if they see lines early enough. Several studies have found that collision risk can be lowered by more than half and, in some cases, by as much as 80% after lines have been marked (APLIC, 2012).

The addition of the project transmission line would add another potential obstacle to birds migrating along the Columbia River. However, by co-locating the line with BPA's existing line it could increase the visibility of the lines and help minimize collision hazards.

The APLIC 2006 guidelines include measures to minimize avian electrocution from powerlines. In areas with bald eagles and other large avian species, the guidelines recommend 60 inches of separation between phase conductors or phase conductors and grounded hardware/conductor. FFP's measures would be consistent with these guidelines. Perch discouragers that deter birds from landing on hazards are also recommended features for new and existing structures. The APLIC 2012 guidelines include measures to minimize avian collisions with powerlines. Appropriate recommendations to reduce collision risks along project transmission lines may include line marking and increased wire diameters. Constructing the proposed transmission lines as recommended by APLIC in both the 2006 and 2012 guidelines would reduce the likelihood of both avian electrocution and collision at the project. FFP proposed measures are consistent with these guidelines.

However, FFP does not include measures for documenting and reporting bird mortality and addressing problem poles. Developing an avian protection plan that includes these procedures would be consistent with APLIC guidelines and better protect birds from electrocution and collision hazards.

3.3.4.3 Cumulative Effects

Wind energy development is occurring in Oregon and Washington within the Columbia Plateau physiographic region (Johnson and Erickson 2011) and much of the habitat in the Columbia Hills above the project have been developed by wind energy farms over the last two decades. According to Klickitat County (2022), there are approximately 1,600 MW of permitted wind projects in the county. The proposed upper reservoir is located in the middle of the Tuolumne Wind Project Authority windfarm, which consists of 15 turbines. It is part of the 62-turbine Windy Point Phase I Wind Energy Project (West 2008).

The influence of energy development, particularly wind energy, taken together with other anthropogenic sources of mortality, including electrocution on power distribution lines, contaminants, collisions with vehicles, and illegal shooting, may be resulting in declining golden eagle populations nationwide (FWS, 2016) and wind energy development is believed to be a factor in the decline of golden eagles Washington (Watson et al., 2020). Other raptors (e.g., Swainson's and ferruginous hawk) are also susceptible to wind turbine strikes.

Construction of the project could increase the attraction of waterfowl and other raptor prey which could increase the risk of raptor collision mortality. However, the use of shade balls as proposed by FFP is likely to prevent birds from recognizing the reservoir surface as water which should minimize the indirect risks associated adverse interactions with the adjoining wind turbines.

Project construction would further fragment existing habitats along the Columbia River used by eagles and other raptors. However, the affected area is small relative to the Columbia Plateau and Columbia Hills and like much of the plateau has been heavily disturbed by cattle grazing and industrial development (e.g., smelter and John Day Dam). Further, grassland and shrub-steppe communities are the most abundant native communities in the plateau and Columbia Hills. Given that the Columbia Plateau is 32,096 mi^2 in size, permanent impacts associated with project would be negligible. Acquiring and managing 277 acres of habitat for the benefit of golden eagles would offset the loss of eagle habitat.

The aluminum smelter site has been designated as a RCRA contaminated site and is subject to a cleanup effort being overseen by Washington DOE. Its cleanup is estimated to begin between 2025 and 2027, potentially overlapping a portion of the proposed project's construction period and occurring on adjacent lands. Exposure to contaminants (poisoning) has been found to constitute nearly 15% of estimated annual mortality of golden eagles in the western U.S. (Millsap et al., 2022). An understanding of potential contaminant sources, exposure rates, and physiological effects to golden eagles at the CGA smelter site is not known. However, the removal of WSI by FFP to construct the lower reservoir and the overall cleanup of the smelter site by the responsible parties should reduce raptor exposure to contaminants as compared to current conditions.

3.3.5 Threatened and Endangered Species

3.3.5.1 Affected Environment

Aquatic Species

Fish listed as endangered that occur in the Columbia River near the project include the Upper Columbia River spring-run Chinook salmon Evolutionary Significant Unit (ESU) and the Snake River sockeye salmon ESU (Washington DFW, 2022a, 2022b; FWS, 2022c). Fish listed as threatened that occur in the Columbia River include the Lower Columbia River, Snake River fall-run, and Snake River spring/summer-run Chinook salmon ESUs; bull trout; the Columbia River chum salmon ESU; the Lower Columbia River coho salmon ESU and the Lower, Middle, and Upper Columbia and Snake River steelhead distinct population segment (DPS) (Washington DFW 2022a, 2019c; FWS, 2022c; NOAA, 2022). All the above listed species except for the Lower Columbia River Chinook salmon and the Lower Columbia River steelhead may use the Columbia River in the vicinity of the proposed project as a migration route both as adults during their spawning run and as juveniles returning to the ocean. The Snake River and Upper Columbia steelhead may never migrate back to the ocean and become resident rainbow trout as well as display overwintering behavior. Thus, some of steelhead may be in the river near the proposed project across all life stages (NMFS, 2022). Snake River spring/summer Chinook salmon often pass the John Day Dam from mid-April to lake February and hold in the river until

late summer (mid-to-late August) before migrating to spawning grounds (NMFS, 2022). Adult Middle Columbia River steelhead may occupy the Columbia River near the proposed project as early as February and as late as November; in addition, Middle Columbia River steelhead utilize the Klickitat River for spawning from March through June. Subsequently, fry emerge from May to July and most fish rear for approximately two years before migrating to the ocean. Bull trout in the Columbia River near John Day Dam may exhibit either a resident or adfluvial life history pattern.

Table 3.3.3-2 in section 3.3.3.2 shows the passage timing for listed salmonids at The Dalles Dam and John Day Dam. The passage timings for Lower Columbia River Chinook salmon, Columbia River chum salmon, Lower Columbia River coho salmon, and Lower Columbia River steelhead were either not available or data did not extend upstream of Bonneville Dam. These four species spawn and rear in the Lower Columbia River (NMFS, 2013) and are part of the Lower Columbia River Recovery Sub-domain, which is part of the larger Willamette/Lower Columbia Recovery Domain.[48] Tables 3.3.5-1 through 3.3.5-3 present annual and seasonal (spring through fall) passage counts of salmonids, American shad, and lamprey at John Day Dam since 1990.

Critical Habitat for Fish—Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features essential to conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation (NMFS, 2022b). The Columbia River adjacent to the project is considered critical habitat for each of the above listed salmon and steelhead (table 3.3.5-4).

Essential Fish Habitat—Essential Fish Habitat (EFH) means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other currently viable waterbodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California (PFMC, 1999). Exceptions include cases in which long-standing naturally occurring barriers (e.g., natural waterfalls in existence for several hundred years) or specifically identified human-made barriers (e.g., dams) represent the current upstream extent of Pacific salmon access (PFMC, 1999). Additionally, some areas that are the focus of reintroductions under section 10(j) of the ESA may be excluded from EFH.

NMFS notes that there are four salmon ESUs that are not listed under the ESA with EFH within the project area: (1) Upper Columbia summer/fall Chinook salmon, (2) Middle Columbia River spring Chinook salmon, (3) Okanogan River sockeye salmon, and (4) Lake Wenatchee sockeye salmon (PFMC, 2014). The following three USGS Hydrologic Units contain EFH for Chinook and sockeye salmon and are in the vicinity of the proposed project; (1) Middle

[48] NOAA Fisheries delineated eight recovery domains, or geographic recovery planning areas, for the ESA-listed salmon and steelhead population on the West Coast. The seven other recovery domains are: Puget Sound, Interior Columbia, Oregon Coast, Southern Oregon/Northern California Coast, North-Central California Coast, California Central Valley, and South-Central/Southern California Coast.

Columbia-Hood 17070105, (2) Middle Columbia-Lake Wallula 17070101, and (3) Klickitat 17070106 (PFMC, 2014).

Terrestrial Species

On February 3, 2022, we accessed the FWS's IPaC database to determine which federally listed species might occur at or near the project. According to the IPaC database, the following species have the potential to occur within the project area: the endangered gray wolf, the threatened yellow-billed cuckoo, the proposed threatened wolverine, and the candidate monarch butterfly.[49]

The gray wolf could occur transiently in the project vicinity because they are wide-ranging habitat generalists. The closest known pack is the White River Pack, approximately 40 miles south of the project area in southeast Wasco County, Oregon, which formed in 2019; there are currently three wolves in the pack (Oregon DFW, 2022c). Other wolf packs in the region are located approximately 100 miles to the East in the Blue Mountains and over 100 miles to the North in the Wenatchee Mountains. Wolves have been observed in Klickitat County (Washington DFW, 2022d), but are thought to be dispersing juveniles.

Yellow-billed cuckoo nest in deciduous habitats with clearings and dense shrubby vegetation, especially those near rivers, streams, and wetlands (Wiles and Kalasz, 2017). Breeding habitat in the western U.S. is typically dominated by cottonwoods and willows, which may be mixed with tamarisk, and many other species (FWS, 2013). There are no riparian forests within the project area that could provide suitable habitat for the yellow-billed cuckoo. Therefore, the cuckoo is not likely to occur at the project site.

Wolverines commonly occur in boreal forest, taiga, and tundra ecosystems, where snow persists through the spring and summer. In Washington, they occupy alpine and subalpine forest habitats in the high elevation mountains of the Cascades and in northeastern Washington. These habitats do not exist at the project; therefore, the wolverine is not likely to occur at the project site.

The project is located within the range of the monarch butterfly. Although there is no documentation of the monarch butterfly at the project, milkweed (Asclepias spp.), a perennial plant that provides suitable habitat for monarch butterfly reproduction and foraging, could occur within the project boundary.

No designated critical habitat for terrestrial species occurs within the project area.

[49] *See* Interior's official lists of threatened and endangered species, accessed by staff using the IPaC database (https://ipac.ecosphere.fws.gov) on February 3, 2022, and placed into the records for Docket No. P-14861-002 the same day.

3.3.5.2 Environment Effects

Aquatic Species

Project construction would not involve any work in the Columbia River, Klickitat River or Swale Creek. Project operation would involve the initial filling of the reservoir with the estimated 7,640 acre-feet of water from the Columbia River and annual make-up water in the amount of 360 acre-feet. Annual operations would result in the upper and lower reservoir capturing rainfall that would otherwise reach existing stream drainages and other water bodies like the Columbia River.

NMFS recommends pursuant to section 10(j) that FFP not obtain water from the Columbia River via Klickitat PUD's intake pool for initial fill at any time from 15 March to 15 October and for periodic make-up water at any time from 1 March to 1 November to ensure sufficient Columbia River flows for out-migrating juvenile salmonids.

Our Analysis

The Klickitat River and the first 12 miles of Swale Creek upstream from its confluence with the Klickitat River are used by Middle Columbia River steelhead. As discussed in section 3.3.2 and 3.3.3 above, the upper reservoir would capture about 86 acre-feet per year of rainfall that currently reaches Swale Creek through tributary streams. However relative to the 103,883 acre-feet per year of rainfall runoff that Swale Creek receives (Washington DOE, 2022a), this impact would be minimal. Further, FFP's proposed mitigation plans (erosion and sediment control plan, SPECP, and stormwater pollution prevention plan) contain sufficient provisions to minimize construction-related effects on water quality in Swale Creek and in turn in the Klickitat River. In addition, streams S7, S8, and upper Swale Creek upstream of Warwick, Washington, are often dry in many portions and as such the potential for any construction-related water quality effects on lower Swale Creek, which salmon and steelhead may inhabit, would be negligible.

Construction activities associated with the proposed lower reservoir as well as cleanup action related to the WSI of the CGA Smelter would have minimal effect on water quality in the Columbia River. The bottom of the WSI is 10 feet above the water table (ERM, 2021a) and as such does not penetrate the groundwater table. FFP's proposed erosion control, stormwater prevention plan, dewatering plan, well monitoring plan, stormwater prevention plan, and reservoir water quality monitoring plan includes BMPs and sufficient monitoring to ensure that project construction and operation would not degrade water quality in the Columbia River.

As noted in section 3.3.3, even if FFP were to withdraw water to fill the reservoirs between March and September when anadromous salmonids are migrating to the sea, the maximum rate at which FFP would withdraw water (i.e., 35 cfs) represents approximately 0.03% of the median flow in the Columbia at this location and 0.08% of the lowest Columbia River flow on record at this location. In terms of volume of flow, the 7,640 acre-feet needed to fill the reservoirs represents approximately 0.01% of the median flow volume and 0.02% of the minimum volume reported in the Columbia River at this location. The estimated 360 acre-feet needed each year for annual make-up water would be orders of magnitude smaller as a

percentage of the total volume of flow in the Columbia River. While these withdrawals would add to the losses occurring from irrigation and other withdrawals in the basin, they are relatively small temporary withdrawals that are not expected to impede ESA-listed salmon smolt migrations to an appreciable degree.

As discussed in section 3.3.3, it is not known whether salmonid juveniles and fry are able to use Klickitat PUD's intake pool. If they can enter the pool, they could become trapped if the water levels drop below the culvert intake. We do not know what the infiltration rate into the pool is or how Klickitat PUD supplying 35 cfs for the project might affect pool levels. Conducting a fry and juvenile survey during their migration period (March to September) would determine whether anadromous fish are likely entering the pool.

Even if fry and juvenile anadromous fish can enter the pool, it is unlikely that they would become entrained through the infiltration gallery and into the project's reservoirs because fry and juveniles must pass through 30 feet of gravel, which should be nearly impenetrable to even fry. Further, Klickitat PUD's pumping system has been operating since the 1970s and there is no information in the record to suggest that it has been adversely affecting ESA-listed fish.

Based on the above analysis and the analyses presented in sections 3.3.3.2 and 3.3.4.2, the proposed construction and operation of the Goldendale Project "may affect, but is not likely to adversely affect" Snake River Fall-run Chinook salmon ESU, Snake River Spring/Summer-run Chinook salmon ESU, Snake River sockeye salmon ESU, Snake River steelhead DPS, Upper Columbia River spring-run Chinook salmon ESU, Upper Columbia River steelhead DPS, Middle Columbia River steelhead DPS, Lower Columbia River steelhead DPS, Lower Columbia River coho salmon ESU, Lower Columbia River Chinook salmon ESU, Columbia River chum salmon ESU, bull trout, and these species' critical habitat.

Essential Fish Habitat

EFH guidelines published in the federal regulations identify Habitat Areas of Particular Concern as types or areas of habitat within EFH that are identified based on one or more of the following considerations:

- the importance of the ecological function provided by the habitat;
- the extent to which the habitat is sensitive to human-induced environmental degradation;
- whether, and to what extent, development activities are or would be stressing the habitat type; and
- the rarity of the habitat type.

Based on the above analysis and the analyses presented in sections 3.2.2.2 and 3.2.3.2, the proposed construction and operation of the Goldendale Project is not expected to adversely affect Chinook or sockeye salmon EFH.

Gray Wolf

Gray wolves are unlikely to occur or use the habitats surrounding the project. There are no known wolf packs in Klickitat County. Washington DFW (2022d) reports a small number of reported wolf observations, but the nearest known pack is over 40 miles away. If gray wolves do occur at the project site, they are most likely transient, dispersing juveniles and would avoid project-related construction and operation activities. Thus, any disturbance to transient wolves related to project construction and operation activities would be unlikely and insignificant. Therefore, we concluded that project construction and operation would not affect the gray wolf.

Yellow-billed Cuckoo and Wolverine

Because there is no suitable habitat to support the yellow-billed cuckoo or wolverine, these species are not likely to occur at the project; therefore, project construction and operation would not affect the cuckoo or wolverine.

Monarch Butterfly

It is unknown whether the project site is used by the butterfly or includes milkweed that might provide suitable habitat for the butterfly. Including the butterfly and milkweed in FFP's pre-construction surveys would allow FFP to take steps to protect the butterfly's habitat if it occurs in the area to be disturbed, such as fencing off occupied areas or including milkweed in its revegetation seed mix.

3.3.6 Recreation and Land Use

3.3.6.1 Affected Environment

Recreation

The proposed project would be located within the Middle Columbia-Hood River watershed on private lands except for about 25.5 acres owned by the state (DOT and DNR lands) and 18.1 acres owned by the Corps which are part of BPA transmission line right-of-way. Therefore, the land within the project boundary does not currently provide access for public recreation and there are currently no public recreational facilities. The nearest recreational opportunities to the project are associated with travel along the Columbia River including portions of the National Historic Lewis and Clark Trail, and State Route 14, which is a scenic highway. State Route 14 crosses between the proposed upper and lower reservoirs. Other nearby recreation opportunities are associated with the Corps-owned and operated John Day Dam, which includes facilities on both the Oregon and Washington sides of the river. The Corps' facilities provide a wide array of recreational opportunities including fishing, primitive and electric hookup camping, picnicking, boating, and interpretative opportunities. John Day Dam Road, which would be used to access the lower reservoir construction site, is the primary access to Corps recreation facilities at Railroad Island and Cliffs Park. The BIA has a Treaty Fishing Access Site next to Railroad Island boat launch. In addition, the road is the secondary ingress/egress for 125 John Day personnel at John Day Dam.

There are several publicly accessible parks including Goldendale Observatory, Goldendale Hatchery, Maryhill State Park, Railroad Island Park, Cliffs Park, LePage Park, and Giles French Park within 10 miles of the project that provide various forms of day-use access. A private hang-gliding launch site, known as Cliffside Launch, is located to the west of the project area. Fishing and boating are available in the Columbia River above and below John Day Dam. Hunting is available on public and private lands within 10 miles of the project and generally includes hunting for deer, waterfowl, small game, and game birds.

Land Use

The proposed project would be located within a rural and agricultural area approximately 8 miles southeast of the town of Goldendale, which has an estimated population of about 3,458 residents. Land cover in Klickitat County includes cropland, pastureland, orchards and vineyards, rangeland, and forest land.

Land within the project boundary is zoned by Klickitat County as Extensive Agriculture, Industrial Park, and Open Space. An Energy Overlay Zone encompasses all three of these zoning designations. The Energy Overlay Zone was established to designate areas suitable for the establishment of energy resource operations based on the availability of energy resources, existing infrastructure, and locations where energy projects can be sited and mitigated. Under this ordinance, siting criteria were established for the utilization of wind and solar energy resources with each energy resource project subjected to individualized review and site-specific conditions imposed to address project effects in accordance with the siting criteria.

Land use surrounding the upper reservoir includes wind farms and dry-land agriculture/rangeland (grazing). This area is primarily classified as Extensive Agriculture and the county encourages the continued practice of farming on lands best suited for agriculture, and to prevent or minimize conflicts between common agricultural practices and nonfarm uses. The project is in the middle of Tuolumne Wind Project Authority's Windy Point Phase I Project, which includes 62 wind turbines; two turbines are located west of the proposed project and 15 are immediately east of the project (figure 3.3.6-1).

The lower reservoir area is classified as Industrial Park which supports the manufacturing, distribution, and assembly of finished products that have relatively light impact on adjacent uses and districts. The lower reservoir site was previously occupied by the aluminum smelter that operated from 1971 to 2003.

Land between the upper reservoir and lower reservoir is classified as Open Space which is intended to conserve the open character of land, and to safeguard the health and safety of people by limiting the development in areas where safe conditions are not possible without excessive costs to the community.

The proposed aboveground transmission line would be located within BPA's existing utility ROW, would use an available circuit on existing BPA transmission line structures that cross the Columbia River and would connect to the existing BPA John Day Substation in Sherman County, Oregon, near the City of Rufus. The portion of the Columbia River adjacent to the proposed project area has an existing shoreline environment designation of urban/industrial

and conservancy. Construction and operation of the proposed project would not occur within the shoreline environmental designations, except for the overhead transmission line. No changes in land use would occur because of the additional line, which has already been permitted for the existing use by BPA.

3.3.6.2 Environmental Effects

Effects of Project Construction and Operation on Recreation

Because the project would be constructed on private land, project construction and operation would not remove or alter any recreation facilities or access to public recreation. Construction-related traffic would increase the volume of traffic on public roads which could create some delays for those recreationists trying to reach Corps' Cliffs Park and Railroad Island Park. The most direct vehicle access to the park is via John Day Dam Road. Additionally, recreational traffic on State Route 14, a scenic highway, could experience travel delays or disturbances during construction.

FFP proposes to coordinate construction schedules and any associated road closures with Washington DOT and Klickitat County to prevent interruption to recreational traffic. FFP states "where temporary disturbance to identified recreational resources are significant and unavoidable, mitigation measures will be identified and implemented."

Although the industrial character of the project site does not offer any recreation opportunities, FFP proposes to install an interpretive sign near the lower reservoir that is accessible to the public and from where the project can be viewed to enhance recreation. The interpretive sign would be handicapped accessible. The interpretive sign will display a map of the project and provide information on pumped storage. In addition, FFP states that subject to further consultation with the Corps, the interpretive sign could be placed on the Corps' managed recreation lands near the project. FFP states that the recreation management measures would be developed and included in a Visual and Recreation Resource Management Plan (VRRMP).

FFP also proposes to develop a fencing and public safety plan to exclude the public from the reservoirs because recreation use of the reservoir is not safe.

Our Analysis

Because recreation resources do not exist within the proposed project footprint or immediate vicinity, project construction and operation would have no permanent adverse effects on existing recreation. Construction-related traffic during the 5-year construction period is likely to create temporary and intermittent traffic delays for those recreationists who are trying to get to destinations within about 10 miles of the project, with the greatest delays likely experienced by those trying to reach Corps' Cliffs Park, and Railroad Island Park. Additionally, the BIA has a Treaty Fishing Access Site next to Railroad Island boat launch that would likely be affected by traffic. This route is also the secondary ingress/egress for Corps personnel at John Day Dam. Development of construction schedules that minimize traffic delays as proposed by FFP would minimize the effects of project-created traffic congestion to the extent practicable. However, coordinating with the Corps, BIA, and tribal governments, in addition to the county and Washington DOT, would alert tribal members and Corps personnel at the John Day Dam to

potential delays and closures, and minimize disruptions to treaty fishing rights and the Corps operations.

As a pumped storage project, project operations (i.e., frequent reservoir fluctuations) would not be compatible with typical recreation activities found at most hydroelectric projects (e.g., swimming, fishing, boating). FFP's proposed fencing and safety plan would protect the public by preventing access to the reservoirs while also securing the hydropower facility.

FFP's proposed interpretive facility would create a new recreational opportunity in the project area by providing information to the public on the history of the surrounding area and the functions of a pumped storage hydroelectric project. However, FFP has not provided any details on the design, location, or content of the interpretive facility, or who would be consulted in the design of the facility. Improperly siting the display could lead to traffic hazards, traffic congestion, and poor use. Conceptual design drawings of the interpretive facility with these above details are needed before the Commission could approve its installation. Consulting Washington DFW, the Corps, BLM, Washington DOE, and the Tribes to develop the interpretive signage would allow agencies to share their expertise and ensure that the interpretative display is built to appropriate standards. Including the signage in the project boundary would facilitate Commission oversight and help ensure that it is effectively managed as a project recreation facility.

Effects of Project Construction and Operation on Land Use

Construction of the upper reservoir would convert about 61acres of land used for cattle grazing to an industrial use in an area that is also used for wind energy production. Construction of the lower reservoir would convert about 63 acres of land used for industrial waste disposal to energy production. Concerns have been raised that suggest construction and operation could affect the operation of the adjoining wind energy farm. We discuss each of these issues below.

Land Use Changes

FFP states that it selected this site in part because of the project's compatibility with existing land uses and zoning, and that it designed the project to minimize greenfield development and to minimize disturbance to current and adjacent land use. Therefore, FFP does not propose any measures to mitigate changes in land use.

Our Analysis

Although land uses in the project area are currently classified as undeveloped by Klickitat County, the lower reservoir area maintains remnant facilities from the CGA smelter, and the upper reservoir site is utilized for wind energy and non-irrigated agriculture (grazing). After project construction, the lower reservoir area would maintain its current industrial land uses. Land used for the upper reservoir and associated facilities would no longer be used for cattle grazing, but adjacent grazing uses are not expected to change. Because the penstock, powerhouse and associated tunnels would be constructed underground, the open space characteristics and land use between the upper and lower reservoirs would not change. The overhead transmission line would be constructed within BPA's existing right-of-way so there would be no change to existing uses. The project would be consistent with existing county land

use zoning because it would be located inside the county's Energy Overlay Zone and would support the integration of renewable energy resources into the grid. However, a conditional use permit may be required from Klickitat County.

The project would be constructed entirely on land owned by NSC Smelter; therefore, no homes or businesses would be displaced by project construction, operation, and maintenance. The private access road that would be used access the upper reservoir was constructed to build, operate, and maintain TID's wind farm. FFP would coordinate its construction activities to minimize disruptions to TID's operations. All project-related land disturbance would occur either on private land or within an existing utility right-of-way owned by BPA. Washington DOT land would be crossed underground by the project's tunnels. Washington Department of Natural Resources land would be crossed only by the existing access road to the upper reservoir. Corps of Engineers, BNSF, and private lands would be crossed by the project's aerial transmission line within BPA's existing transmission right-of-way. Therefore, project construction and operation would be compatible with existing land uses.

Compatibility with Wind Energy Development

TID asserts that construction and operation of the proposed project could interfere with or reduce the output of its wind turbines. TID believes that the change in topography following the construction of the project reservoirs would cause a change in wind patterns, speed and turbulence that could reduce the output of the turbines and damage the turbines. TID recommends that FFP conduct a more robust wind analysis study that comports with industry practices and uses a multiple year data set to examine how the project would affect wind direction and stresses on its turbines. TID also believes that project construction could create vibrations that would adversely affect its turbine foundations and disrupt its underground distribution system that connects the energy output of all its turbines.

FFP states that its wind analysis study reasonably demonstrates that project operation would not substantially alter wind patterns and opposes conducting further studies. FFP states that it intends to avoid impacts to TIDs operations from drilling and vibrations by: (1) developing a detailed map of existing utilities, including the underground 34.5-kV distribution system; (2) potentially refine portions of the upper reservoir footprint if necessary to avoid or minimize impacts to the underground utilities; (3) develop detailed contractor requirements for maximum construction vibrations associated with the constructing the upper reservoir and installing the vertical shaft for the headrace tunnel; and (4) develop a construction monitoring program, including definition of vibration criteria, to ensure no damage to the wind farm facilities. FFP would develop the plan during final design in consultation with final design engineer and TID.

Our Analysis

Wind Effects

FFP contracted ERM (2021) to evaluate the changes in wind speed and direction and turbulence that would result from constructing the upper reservoir on the operation of the 15 turbines closest to the proposed upper reservoir, with a focus on the two closest to the upper

reservoir (turbines 17A and 17B). ERM (2021) used the Advanced Research version of the Weather Research and Forecast (WRF) model to characterize existing and modified wind flows, wind speed, and turbulence (expressed as turbulent kinetic energy or TKE). ERM modeled 2 years (2014 and 2019). These years represented years with the greatest wind speeds and the highest generation and thus likely to experience the greatest stress on the turbines.

The WRF model shows some increases and decreases in wind and TKE, but on average the changes are close to zero. Predicted wind speed changes due to the presence of the reservoir range from -0.09 to +0.05 meters/second (m/s) for 2014 and from -0.04 to 0.06 m/s for 2019. The highest TKE values are confined to near the ground surface and decrease with height and minimal impact at the hub height of 80 meters. Predicted changes to TKE at hub height range from -.034 meter squared per second squared (m^2/s^2) to 0.031 m^2/s^2 for 2014 and -.050 $m^2/s^2$to 0.031 m^2/s^2 for 2019. On average, changes in TKE at all turbines analyzed are close to zero (ERM 2021). Wind speed and direction changes, on average, are also close to zero at the locations of all turbines (ERM 2021). The WRF model suggests, with reasonable certainty, that there would be only minor changes in wind and turbulence due to the presence of the upper reservoir. Therefore, construction and operation of the pumped storage project should not be incompatible with the adjoining wind farm operation.

Vibration Effects

One wind turbine is currently located immediately above where the proposed headrace tunnel would be constructed, and several others are located near the upper reservoir. Project construction would require drilling and blasting which would create underground vibrations. Additional geotechnical information and final engineering design information is needed to evaluate potential vibration effects on TIDs infrastructure. FFP's proposed measures to reduce and monitor vibrations should help minimize those effects.

3.3.7 Aesthetics Resources

3.3.7.1 Affected Environment

The proposed project would be located within a viewshed that varies from rolling terraces and rangeland in the hills above the Columbia River where the upper reservoir would be constructed to a more industrial setting along the Columbia River dominated by the Corps' John Day Dam, BPA transmission lines, and the former CGA smelter. Numerous wind turbines are a prominent feature on the hills above the Columbia River.

To evaluate the effects of constructing the project on the aesthetics of the viewshed, FFP conducted an Aesthetic Resources Study in 2019 in accordance with the BLM Visual Resource Management Inventory and Contrast Rating System. Because the upper and lower reservoir areas are separated by a large elevation change and consist of distinct visual settings, FFP divided the viewshed into two landscape units: landscape unit 1 consists of the high desert plateau at about 2,500 feet above the Columbia River and landscape unit 2 consists of former floodplain 580 feet above the Columbia River. Views in landscape unit 1 are characterized by a large area of rangeland with agricultural fields, wind turbines, roads, power transmission lines, and a small area of woodlands. Viewers in landscape unit 1 consist mostly of travelers on local

roads and residents of the rural communities. Views in landscape unit 2 is characterized by: the Columbia River, the hills leading up to the Columbia Hills, wind turbines, the John Day Dam, BPA transmission line corridors, and the former CGA smelter. A single reported residence is 0.4 mile away from the lower reservoir area in landscape unit 2. There are no other homes immediately adjacent to the proposed project. Viewers in landscape unit 2 consist of mostly of travelers on scenic highway SR 14, Interstate 84, and recreational users along the Columbia River or at nearby parks and trails. SR 14, which includes the Lewis and Clark Scenic Trail Highway, is a highly trafficked scenic highway with an annual average daily traffic count of 4,700 vehicles (for the year 2020) at milepost 1.89, east of the intersection with U.S. Route 97. Interstate 84 is also a heavily traveled scenic highway with an annual average daily traffic count of 12,700 vehicles around milepost 109, about 3 miles northeast of where the proposed transmission line crosses over the Columbia River.

FFP identified five key viewpoints to reflect existing conditions and how the views would change following project construction. Figure 3.3.7-1 shows the locations of the five key observation points (KOPs). Figures 3.3.7-2 and 3.3.7-3 are representative views of the upper and lower reservoir areas, respectively. Views from each KOP before and after project construction are shown in figures 3.3.7-4 through 3.3.7-8.

FFP scored and ranked the scenic quality of each KOP using BLM's VRM system and then determined the level of visual contrast created by project features and project compatibility with VRM classes by creating and analyzing photo-simulations of project features. The text below describes each KOP.

KOP 1

KOP 1 (figure 3.3.7-4) is located at the intersection of Hoctor Road and U.S. Route 97. This KOP was selected because it represents potential views of the upper reservoir from a segment of the heavily traveled U.S. Route 97 (traffic count of 5,297 vehicles per day, Washington DOT, 2016) south of Goldendale. The landscape consists of a flat plateau and rolling/undulating Columbia Hills to the south. Irrigated agricultural fields dominate the foreground, with grassland, shrub-steppe, and oak woodlands dominating middle ground along the hills near the project. Existing visible structures include wind turbines, power poles, transmission lines, Old Highway 97, U.S. Route 97, Hoctor Road, a small Northwest Pipeline Corporation facility, and residential structures including farmhouses and barns.

KOP 2

KOP 2 (figure 3.3.7-5) is located at the intersection of Willis Road and Hoctor Road facing south. This KOP was selected because it represents potentially prominent views of the location for the upper reservoir for the public that travel along Hoctor Road. Views of the landscape at this location are primarily the rolling/undulating Columbia Hills, with the beginning of a flat plateau adjacent and to the south of KOP 2. Irrigated agricultural fields dominate the area adjacent to the KOP, and the hills in the foreground are vegetated by grassland, shrub-steppe, and western juniper and ponderosa pine woodlands. Existing visible structures from this KOP include wind turbines, power poles, transmission lines, irrigation lines, Hoctor Road, Willis Road, and residential structures including farmhouses and barns.

KOP 3

KOP 3 (figure 3.3.7-6) is located at the top of the Columbia Hills at Juniper Point looking south at the proposed location of the lower reservoir. The KOP is located approximately 300 feet on the downslope side from a radio tower. The KOP is on NSC Smelter property and is currently not accessible to the public. This location was selected because it provides a good vantage point overlooking the proposed location of the lower reservoir from Juniper Point, which has been identified as a sensitive cultural location for Tribes in the area (see section 3.3.8, *Cultural Resources*). At an elevation of 3,000 feet above msl, the location of the KOP is approximately 2,500 feet higher than the site for the lower reservoir. The landscape consists of the Columbia Gorge with a view of the Columbia River below basalt cliffs, the mouth of the John Day River, and an expansive plateau spreading out above the river. Existing visible structures include the town of Rufus, John Day Dam, Interstate 84, State Route 14, the former CGA smelter, wind turbines, and transmission lines.

KOP 4

KOP 4 (figure 3.3.7-7) is located on a gravel pullout adjacent to the southeast side of State Route 14 above the proposed location of the lower reservoir. It was selected for the ease of public access, proximity to the project, and for cultural significance of the Lewis and Clark Trail Highway and as a Scenic and Recreational Highway. KOP 4 provides a close-up vantage point for the scale and size of the project facilities associated with the lower reservoir and substation. The landscape consists of talus slopes associated with the Columbia Hills to the east, basalt cliffs that abruptly transition into the Columbia River to the South, and the flat floodplain adjacent to the river. Existing visible structures at this location include State Route 14 and Interstate 84, the former CGA smelter, John Day Dam, transmission lines, wind turbines, railroad tracks, campers and other evidence of recreational use by the public along the bank of the river.

KOP 5

KOP 5 (figure 3.3.7-8) is located near the town of Rufus along the bank of the Columbia River in Giles French/John Day Dam Park, facing north across the river toward the lower plateau and the location of the lower reservoir. This location was selected because it represents the views from the public park along the banks of the Columbia River as well as similar views from the town of Rufus and Interstate 84. The landscape consists of large talus slopes associated with the Columbia Hills on the north side of the Columbia River and prominent basalt cliffs that abruptly transition into the Columbia River. Existing visible structures include commercial and residential buildings in the town of Rufus, Interstate 84 and State Route 14, John Day Dam, transmission lines, structures associated with the former CGA smelter, wind turbines, and campers along with other evidence of recreation on both banks of the river.

3.3.7.2 Environmental Effects

Project construction and operation would result in both temporary and permanent changes to the viewshed. Temporary changes would result during the 5 years of project construction when land clearing and facility construction would occur. During construction, equipment such as transmission tower components, large trucks, drilling and grading equipment,

cranes, and equipment for stringing the transmission line on BPA's existing structures would be visible. Once constructed, the reservoirs, 230-kV transmission line, and substation would be visible from certain viewpoints, with the most prominent features being the upper and lower reservoirs because of their large size. Project lighting would also increase light pollution and draw attention the project features during operation. Most construction would occur during the day; however, staging and construction areas may need temporary construction lighting supplied by light buggies or trailers.

To minimize adverse visual effects, FFP proposes to: (1) "use engineering controls during the final design process" to reduce visible contrasts between the existing landscape and the proposed project from sensitive viewing areas; (2) minimize footprints or aboveground features to the furthest extent possible; (3) ensure facilities are free of debris and store unused or damaged equipment offsite during project operation and during construction monitor the construction area and establish areas for temporary storage of construction debris where practical; (4) use natural paint colors and surfacing materials that match the surrounding landscape and dull reflective surfaces that cannot be painted; (5) plant native vegetation and/or trees to break up the lines of roads and facilities and soften the visual effect on the landscape; and (6) design facility lighting to prevent casting of light into adjacent native habitat and minimize lighting to the extent possible through the use of directional lighting, fully shielded low-pressure sodium lighting or light emitting diode (LED) lighting and operational devices, covers, timers, motion sensors, or other means. FFP states that Class II lamp source and shielding requirements will be used where outdoor lighting is required.

No entity recommended any measures to address visual resources.

Our Analysis

Seven groups of observers could be affected by the construction and operation of the project: motorists on State Route 14, motorists on Interstate 84, motorists on U.S. Route 97, motorists on Hoctor Rd, residents and landowners adjacent to the project area, and visitors to areas adjacent to the project, including the John Day Dam (Giles French / John Day Dam Park, Oregon), Cliffside Launch, and Yakama tribal members using *Pushpum* for teaching and cultural practices. The closest residence to the project is 0.4 mile away from the lower reservoir area.

The upper reservoir will be visible on the upper plateau in a rough line that extends from the east to the west along Hoctor Road and is represented by views from KOP 1 and KOP 2 (figure 3.3.7-4 and 5). KOP 1 received a scenic quality rating of 13 and a B ranking, meaning that the landscape is of above-average diversity of interest. The east face of the project's upper reservoir would be approximately 5 miles southwest from the viewpoint. KOP 2 received a scenic quality score of 8 and a C ranking, meaning that the landscape is primarily common to the region and offers minimal diversity and distinguishing characteristics. From both locations, the reservoir berm would appear as a small tan-brown mass along the top of the gently rolling ridge, creating a horizon line that blends with the ridge. Because of the distance from the viewpoints and the subtle form of the reservoir wall, the contrast rating score for these sites was 1 (weak contrast).

The project's lower reservoir, substation, and transmission line would be visible about 1 mile south of KOP 3 located on Juniper Point (figure 3.3.7-6), in a vista that includes the Columbia River, the John Day Dam and locks, the BPA transmission line, and the former smelter. KOP 3 received a scenic quality score of 16 and a B ranking, meaning that the landscape is of above-average diversity of interest. Due to the size of the reservoir, the visual contrast rating is 2 (moderate) where contrast starts to attract attention to the viewer and starts to dominate the landscape character. However, KOP 3 is located on private lands and would not be visible to the public but does have tribal significance. Tribes are sensitive to changes in the natural physical landscape because such disturbances can impact the spirituality and well-being of the viewer. Wind turbines, the CGA smelter, and John Day Dam are also prominent features on the landscape from the area and indicative of the views from *Pushpum*. Nonetheless, project construction would add another development further adversely affecting the visual quality of the views from *Pushpum* for tribal members and could further interrupt Tribal cultural practices and impact the expression of Tribal spirituality.

Prominent views of the lower reservoir and substation are possible from State Route 14 (KOP 4), as well as partial views from State Route 14 as it continues east alongside the former smelter. KOP 4 received a scenic quality score of 13 and a B ranking, meaning that the landscape is of above-average diversity of interest. The project's lower reservoir is prominent in the views in the foreground while the substation and transmission line would be visible to the south and east approximately 0.13 miles in the middle ground and background (figure 3.3.7-7). The overall vista includes the Columbia River, the John Day Dam and locks, the BPA transmission line, and the former smelter in a landscape of a steep rocky cliff and rolling hills. Due to the prominence of the lower reservoir, the visual contrast rating is 3 (strong) where contrast attracts attention to the viewer and dominates the landscape character. The proposed project is consistent with existing development because of the dominance of the smelter.

The Oregon side of the Columbia River includes prominent views of the project from the parks and recreation sites along the south bank of the Columbia River (Giles French / John Day Dam Park), Interstate 84 and the town of Rufus (represented by KOP 5). Partial views of the lower reservoir will likely be available from Interstate 84 near the confluence of the John Day and Columbia Rivers. However, local topography along both sides of the Columbia River makes viewing the lower reservoir only possible as brief glimpses from higher vantages along the highway. KOP 5 received a scenic quality score of 17 and a B ranking, meaning that the landscape is of above-average diversity of interest. The lower reservoir berm would appear as a short and wide brown mass tucked in among the cliffs, creating a horizon line that blends with other ridges slopes nearby approximately 1.2 miles from the viewpoint (figure 3.3.7-5). Because of the distance from the viewpoint and the subtle form of the reservoir wall, the contrast rating score for this site was 2 (weak).

The proposed project site is located approximately 10 miles west of the Columbia River Gorge National Scenic Area (CRGNSA) and would not be visible from the CRGNSA based on distance and topographic relief.

As noted above, the upper and lower reservoirs, substation, and transmission line will contrast to varying degrees with the surrounding landscape, with the transmission line having the farthest-reaching visual impact because of its linear nature and proximity to roads and recreation

areas and because it would cross the Columbia River. However, because of the remoteness of the project area, use of an existing transmission line rights-of-way and posts, former and current industrial (i.e., wind farms and smelter) uses, and long viewing distances from most publicly accessible areas, these project features would be consistent with existing industrial uses and thus would have limited effects on the viewshed. FFP's proposed screening, painting, and lighting measures would minimize adverse effects of constructing and operating the project to extent practicable.

3.3.7.3 Cumulative Effects

The aesthetics of the Columbia Hills and the Columbia River has dramatically changed over the years with the construction of the railroad, John Day Dam and associated transmission lines, smelter facilities, Klickitat PUD's water pumping station, and numerous wind turbines that line the Columbia Hills. The addition of the upper and lower reservoirs, substation, and transmission line would add to the industrial setting but would be consistent with the industrial character of current land uses.

3.3.8 Cultural Resources

3.3.8.1 Affected Environment

Section 106 of the NHPA requires that the Commission evaluate the potential effects on properties listed or eligible for listing in the National Register. Such properties are called historic properties. In this document, we also use the term "cultural resources" for properties that have not been evaluated for eligibility 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. Section 106 also requires that the Commission seek concurrence with the SHPO on any finding involving effects or no effects on historic properties and allow the Advisory Council on Historic Preservation (Advisory Council) an opportunity to comment on any finding of effects on historic properties. If Native American (i.e., aboriginal) properties have been identified, Section 106 also requires that the Commission consult with interested Indian Tribes that might attach religious or cultural significance to such properties.

Area of Potential Effects

Pursuant to section 106, the Commission must take into account whether any historic property could be affected by the issuance of a proposed license within a project's APE. The APE is determined in consultation with the SHPO and is defined as the geographic area or areas within which 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 Goldendale Project consists of 652 acres of privately held land that encompasses the proposed project facilities. The APE includes all areas where ground disturbance and project activities would occur. FFP requested concurrence from the Washington and Oregon SHPO's on the definition of the APE. The Washington SHPO concurred with the APE in a letter dated September 30, 2021 (filed January 25, 2022). The Oregon SHPO did not respond regarding the APE.

Cultural Historic Context[50]

Aboriginal Settlement

Human occupation of the Columbia Plateau began during the Late Pleistocene/Paleoindian period (11,500 before present [B.P.]). At this time, highly mobile hunter-gatherers traversed the landscape. Archaeological sites dating to this period reflect the Western Clovis complex or the Western Stemmed tradition. These hunter-gathers continued to occupy the region between 11,500 – 7,000 B.P (Phase I).

Between 7,000–3,900 B.P. (Phase II), a change in subsistence strategies occurred which may have been a response to weather conditions. Populations became more sedentary and increasingly dependent on the gathering of roots, fishing, and the collection of other aquatic resources such as mussels. This shift is reflected in the archaeological record by the presence of semi-subterranean pit houses, large milling stones used in the processing of root and seasonal plant resources, and additional changes in projectile point forms.

Between 3,900 B.P.–A.D. 1720 (Phase III), populations increased, and people congregated in large riparian villages to exploit local food resources. Pit house structures became larger and more elaborate. Occupants of these villages relied strongly on Columbia River fishing as evidenced by the storage of salmon, a dramatic increase in salmon remains in archaeological faunal assemblages, and the presence of refined fishing implements such as harpoons and fishhooks, at archaeological sites dating to this period. The use of bow and arrow technology indicates hunting of both large and small game and the processing of local plants also remained important. Trade networks with other groups is reflected by the presence of ornaments and beads fashioned from marine shells and other exotic materials.

Native Peoples of the Project Area

The Goldendale Project lies within the traditional territory of the ancestors of the Yakama, Umatilla, Warm Springs, and Nez Perce peoples. Ethnographic accounts typically refer to the Yakama and closely related but independent Klickitat, the Umatilla, and the Sk'in groups as residing in this region.

The nearest documented Yakama village is located 15 miles northwest of the proposed project but a rock formation (*Pushpum*) near the project is important in Yakama and Umatilla traditional stories. Traditional Umatilla territory extends from the project area east to the Grande Ronde Valley and south along the John Day River. The area between The Dalles and Boardman (west-east), and between John Day and the Warm Springs Reservation (south-north) was attributed to the Western Columbia River Sahaptins. Two Western Columbia River Sahaptin permanent villages are located 5 to 13 miles from project, both of which are outside the area of potential effects.

In the spring, tribal members collect plant resources along the Columbia River, including roots, berries, and camas and constructed weirs and traps to take fish during strong spring runs.

[50] The cultural history context is adapted from FFP, 2021 (HPMP).

These activities occurred until at least 10 to 20 years ago. In the past, these activities served to reestablish relationships, socialize, and trade with other groups. In the summer months, these activities would continue with family groups residing in large riverine villages. In the fall, when the fish runs declined, people moved to locations above the river to hunt and trap animals and gather other plant resources such as autumn roots and bark to provide resources for the winter. Seasonal camps were constructed of temporary tents or structures of tule mats placed over a cottonwood frame and pit houses were used for ritual, sweats, and storage purposes. Tasks including hunting, gathering, tool manufacture and repair, food processing associated with resource procurement and were divided between all members of the group.

Beginning in the 1770s, Native populations were subjected to disease brought to the region by non-Native people. These diseases, including but not limited to smallpox, measles, and malaria, decimated the indigenous people of the Columbia River.

In June of 1855, several treaties were signed with the Tribes of the region. These treaties were ratified in 1859. On June 9, 1855, the *Treaty between the United States and the Yakama Nation of Indians* (Yakama Treaty) and the *Treaty between the United States and the Walla Walla, Cayuses, and Umatilla Tribes and Bands of Indians in Washington and Oregon Territories* (Treaty of Walla Walla), were signed. The Yakama Treaty established the 1.2 million-acre Yakama Indian Reservation for the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), which included 14 Tribes and bands including the Klickitat and Sk'in peoples. Under the Yakama Treaty, the Yakama Nation ceded almost eleven million acres of land. These ceded lands encompass the Goldendale Project APE, but the project site is not located within any tribal reservation. The Yakama Indian Reservation currently consists of more than 6,000 members. Under the Treaty of Walla Walla, the 500,000-acre Umatilla Tribes' reservation was established, and the Umatilla, Walla Walla, and Cayuse Tribes ceded 6.4 million acres of land. Currently, the reservation is approximately 172,000 acres in size.

On June 11, 1855, The Nez Perce signed the *Treaty between the United States of America and the Nez Perce Indians* (Nez Perce Treaty) that reduced their territory from 13 million acres to a 7-million-acre reservation. A subsequent treaty reduced the reservation to 757,000 acres. A third treaty in 1869 included provisions for timber harvesting. In 1895, reserved lands were opened for non-Native settlement, and this further reduced Nez Perce land to less than 100,000 acres.

The *Treaty between the United States and the Confederated Tribes and Bands of Indians in Middle Oregon* (Treaty with the Tribes and Bands of Middle Oregon) was signed on June 25, 1855. This treaty established the Warm Springs Tribes' reservation. A Tribal government was formed in 1938 and the Tribal government signed a Declaration of Sovereignty in 1992 in which they "declared the sovereign authority of the Tribe to determine our destiny and control all persons, land, water, resources, and activities free from outside interference" (CTWSRO, 2021 as cited by FFP, 2022).

As part of the Yakama Treaty,[51] the Treaty of Walla Walla,[52] the Nez Perce Treaty,[53] and the Treaty with the Tribes of Middle Oregon,[54] the Tribes agreed to relinquish title to the previously ceded lands but retained their rights to hunt, fish, and gather resources on open and "unclaimed lands" outside of their respective reservation boundaries. Today, members of the Yakama Nation, Umatilla Tribes, Nez Perce Tribe, and Warm Springs Tribes protect the rights provided to them in their respective treaties.

Euro-American Settlement and Occupation

English and Spanish explorers first surveyed the Pacific Northwest region in the 1770s followed in 1805 by the Lewis and Clark Expedition. Lewis and Clark passed by the John Day River directly across the Columbia River from the proposed Goldendale Project. They encountered people in this area who they referred to as the "Wah-how-pums." Upon their return after reaching the Pacific Ocean, Lewis and Clark camped near the location of the John Day Dam and met members of the "Eneshur nation." Further explorations followed, and in 1824, the Hudson's Bay Company established Fort Vancouver on the Columbia River about 75 miles upstream from the Pacific Ocean.

Settlement of the region that was to become Klickitat County expanded by the 1850s. As a result, Native groups were displaced, but their trails, and those established by the Hudson's Bay Company were the primary routes through central and western Washington until the construction of railroads and territorial roads. The Spokane, Portland, and Seattle Railway completed the construction of a railroad line on the north side of the Columbia River in 1908. The presence of the railroad subsequently led to the establishment of towns along the railway route. By 1980, the railroad became part of the Burlington Northern route.

Early industries in the vicinity of the project were lumbering and livestock. Settlers ultimately established ranches on the flat lands along the river, and by the late 1800s the lands were also found to be suitable for raising wheat, fruits, and nuts. However, by the 1930s,

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[51] See Article 3 of *Treaty between the United States and the Yakama Nation of Indians*, June 9, 1855, ratified March 8, 1859. Available at: https://goia.wa.gov/tribal-government/treaty-yakama-1855.

[52] See Article 1 of *Treaty between the United States and the Walla Walla, Cayuses, and Umatilla Tribes and Bands of Indians in Washington and Oregon Territories*, June 9, 1855, ratified March 8, 1859. Available at: http://goia.wa.gov/tribal-government/treaty-walla-walla-1855.

[53] See Articles 3 of *Treaty between the United States of American and the Nez-Perce Indians*, June 11, 1855, ratified April 29, 1859. Available at: https://digitalcollections.lib.washinton.edu/digital/collection/lctext/id/7614.

[54] See Article 1 of Treaty between the United States and the Confederated Tribes and Bands of Indians in Middle Oregon, June 23, 1855, ratified April 18, 1859. Available at: https://platuauportal.libraries.wsu.edu/digital-heritage/treaty-between-united-states-and-confederated-tribes-and-bands-indians-middle-8.

nutrients in the soil had depleted and alfalfa was introduced. In the 1950s, agricultural systems improved with the installation of better irrigation systems.

In 1968, the Corps of Engineers completed construction of the John Day Dam, creating Lake Umatilla (the John Day Reservoir). John Day Dam and reservoir is one of the largest hydroelectric structures in the United States and is located less than a mile from the proposed project. Also located nearby was the smelter, which operated between 1970 and 2003.

Archaeological, Traditional-Ethnographic, Historic, and Architectural Investigations

Archaeological Resources

The licensee contracted with the Yakama Nation Cultural Resources Program (CRP) in 2018 to conduct a cultural resources survey of the project APE (Shellenberger et al., 2019). The survey was conducted in accordance with the Secretary of the Interior's Standards and Guidelines for Identification and other guidance for cultural resources documentation. Pre-field research included a record search of the Washington State Department of Archaeology and Historic Preservation cultural site and cultural survey database, a review of the Yakama Nation cultural site atlas, and consultation with Yakama Nation CRP cultural specialists. An archaeological survey of the APE was conducted in July 2019. Encompassing approximately 500 acres, the area included the locations of all proposed project facilities, laydown areas, substation/switchyard, and the locations of other appurtenant facilities. Areas within the APE that were not surveyed included lands where no project-related activities would occur, and the lands located above underground facilities (e.g., the underground water conveyance system and powerhouse) that would not be disturbed.

Based on archaeological and traditional cultural property analysis, a detailed literature review and a pedestrian survey of the proposed project APE, Shellenberger et al. (2019) identified 6 archaeological sites within the proposed project APE that could be affected by project construction (45KL566, 45KL567, 45KL570, 45KL744, 45KL746, LS-3). Three sites (45KL1296, 45KL1297, 45KL1298) are in the APE boundary but are outside the area that would be directly affected by project development. Two previously recorded sites were not relocated (45KL1172, 45KL772). Shellenberger et al. (2019) also concluded that the proposed project area is within a National Register of Historic Places-eligible TCP (*Pushpum*)[55] and a NRHP-eligible Multiple Property Documentation TCP (Columbia Hills) and one Archaeological District (Columbia Hills District). Archaeological resources found during the surveys involve both sites and isolated finds (locations of isolated artifacts or features).

Subsequently, Davis et al. (2021) tested the six archaeological sites to determine each site's National Register eligibility and to assess project-related effects. During the fieldwork, two sites (45KL467/569 and 45KL570) were combined into a single resource resulting in five sites being tested. All five sites were recommended as individually eligible for listing under National Register criteria A and B for their association with important events and people, and

[55] *Pushpum* or Juniper Point in the Columbia Hills overlooks the proposed Goldendale Project. It is also referred to as "*Put-a-lish*" by the Rock Creek Band of the Yakama Nation.

under Criterion D for their potential to answer important questions pertaining to the prehistory of the area. All five sites are also recommended as contributing resources to the Columbia Hills Archaeological District (45DT241). Sites 45KL566, 45KL567/570, and 45KL2476 are recommended to be contributing resources to the *Pushpum* TCP, and Sites 45KL744 and 45KL746 are recommended to be contributing resources to the *Nch'ima* and *T'at'alíyapa* TCPs[56] discussed further below. Notably, only the precontact components at sites 45KL744 and 45KL746 are recommended individually eligible and as contributing to the *Nch'ima* and *T'at'alíyapa* TCPs; the historic-period component at these sites do not contribute to their eligibility. A memorandum summarizing the results of the study was filed with the Commission on November 20, 2020. Copies of the memorandum (Davis, et al, 2020) were also provided to the Washington SHPO for review and concurrence and to the participating Tribes. A final report presenting the results of the testing was filed with the Commission on March 30, 2021 (Davis et al, 2021).[57] In a letter dated September 30, 2021 (filed January 25, 2022), the Washington SHPO concurred with the recommendations of National Register eligibility for the five evaluated sites.

Traditional Cultural Properties

Three studies related to TCPs were conducted for the Goldendale Project. These studies are briefly summarized below. However, specific details regarding these studies and the properties that they describe are not included due to confidentiality concerns.[58]

Yakama Nation—In 2021, the Yakama Nation CRP's chosen ethnographer identified two potential TCPs located within the project APE (Shellenberger, 2021). The report recommends that *Pushpum* and *Nch'ima* as eligible for listing on the National Register under criteria A, B, C, and D. The report also identified two Multiple Property Districts (MPDs): the previously documented Columbia Hills Yakama Indian Traditional Use MPD (Columbia Hills MPD; Thompson, 1997 as cited by Shellenberger, 2021) and the Coyote's Journey MPD. In a letter dated April 23, 1997 (filed July 2, 2021), the Washington SHPO concurred that *Pushpum* and the Columbia Hills Yakama Traditional Use Area are eligible for listing on the National Register under criteria A, B, C, and D. The Yakama report explains that the purpose of a MPD is to nominate groups of significant related properties to the National Register, but a MPD is not by itself a historic property nor is it a nomination for listing on the National Register. Instead, a MPD provides a foundation and context for future nominations. The existing property documentation form for the Columbia Hills MPD was updated as part of the Yakama Nation's

[56] *Nch'ima* describes a large fishing ground at the present-day location of John Day Dam, most of which included a large island that is now covered by John Day Dam and reservoir.

[57] In its comments on the Commission's Ready for Environmental Analysis notice filed on May 24, 2022, the Environmental Groups inquired regarding the status of National Register eligibility recommendations for both archaeological resources and TCPs. As noted, these evaluations have been completed.

[58] In its comments on the Commission's Ready for Environmental Analysis notice filed on May 24, 2022, the Environmental Groups inquired regarding whether participating Tribes provided input or conducted the TCP studies. As noted, the Yakama Nation, Umatilla Tribes, and Nez Perce either selected their own ethnographer to conduct the study or submitted results of their own study.

study. However, the report states that the original boundaries of *Pushpum* were not drawn correctly and are much larger because they do not encompass important root-gathering areas. We find that both *Pushpum* and *Nch'ima* are eligible for listing on the National Register under criteria A, B, C, and D.

Confederated Tribes of the Umatilla Indian Reservation—The second study was undertaken by the Umatilla Tribes' Cultural Resources Protection Program in 2021. The report (Battaglia and Steinmetz, 2021) identifies two historic properties of religious and cultural significance to Indian Tribes within the project APE (*Pushpum* and *T'at'ałíyapa*). One of these locations (*Pushpum*) was also identified by the Yakama Nation as a TCP. *T'at'ałíyapa* is a large area that encompasses the rock outcroppings, fishing sites, and both shorelines of the Columbia River alongside *Pushpum.* In the project area, it overlaps with the TCP identified by the Yakama as *Nch'ima.* Battaglia and Steinmetz (2021) concludes that both *Pushpum* and *T'at'ałíyapa* are eligible for listing on the National Register. Like *Pushpum*, *T'at'aliyapa* is considered a location for gathering First Foods and important in the oral traditions and legendary stories of the Umatilla tribes. On January 4, 2022, a copy of the report was provided to the Washington SHPO for review and comment. In a letter dated January 5, 2022 (filed January 25, 2022), the Washington SHPO acknowledged receipt of the report but stated that it was incomplete because it did not provide any federal agency determination of eligibility or the Umatilla Tribes' concurrence on National Register recommendations. We find that *T'at'ałíyapa* is eligible for listing on the National Register under criteria A, B, C, and D.

Nez Perce Tribe—In 2021, the Nez Perce Tribe CRP conducted a study of traditional land uses in the vicinity of the proposed project (Moon, 2021). The report identifies potential TCPs and place names in the region. None of these locations are within the boundaries of the Goldendale Project APE. However, the report provides extensive information about traditional uses in the region, emphasizes the Tribe's connection to the area, and presents the concerns of Tribal elders about the proposed project. The report also expresses concern regarding impacts to archaeological resources located within the APE.

The Yakama Nation, Umatilla Tribes, and Nez Perce reports demonstrate the strong ties that these Tribes have to the project area and their use of the lands for traditional purposes. While the Warm Springs Tribes did not participate in a TCP or traditional use study, the Tribe expressed the same concerns about the Goldendale Project as the other Tribes in its comments on FFP's draft treatment plan for site 45KL746, which were filed on November 2, 2021.

Historic Built Environment Resources

The only historic structures within the project's APE are the John Day Lock and Dam, BPA transmission line, and BPA's substation (Perrin, 2021). The John Day Lock and Dam facility, which was constructed between 1958 and 1972, constitutes a historic district that is eligible for listing on the National Register under Criterion A for its association with the Corps' federal dam building program and regional development of the Columbia River, and under Criterion C for its engineering. BPA's John Day substation and Rock Creek–John Day No. 1 transmission line were both constructed in 1968. Two switchyards associated with the substation were built in 1968 (northwest switchyard) and 2007 (southeast switchyard). According to the

Oregon Historic Sites database, BPA determined that the substation and transmission line are each eligible for listing on the National Register under Criterion A.

3.3.8.2 Environmental Effects

Effects on Archaeological Resources and Traditional Cultural Properties

Project construction would require blasting, soil excavation, and use of heavy equipment that would remove each of the five individual archaeological resources, which are contributing elements to the larger Columbia Hills Archaeological District and the three TCPs (*Pushpum, Nch'ima*; Shellenberger, 2021, and *T'at'ałíyapa*; Battaglia and Steinmetz 2021). Ground disturbance would also occur in areas where no archaeological sites have been identified during recent surveys, but there is still a potential for previously unrecorded sites to be identified during construction. Construction of the proposed project would occur in *Pushpum*, *Nch'ima*, and *T'at'ałíyapa*, which are areas used for resource gathering and other ritual and cultural activities. Construction of the project reservoirs would permanently prevent culturally significant activities from occurring in the area occupied by the reservoirs, although it is not clear when these activities last occurred.

To mitigate these effects, FFP proposes to develop a Historic Properties Management Plan in consultation with the Washington SHPO and the affected tribes. On December 15, 2021, FFP provided a draft of the HPMP to the Washington SHPO, Yakama Nation, Umatilla Tribes, and Warm Springs Tribes for a 30-day review. In a December 15, 2021 letter (filed January 25, 2022), the Washington SHPO expressed concern that a collaborative effort to prepare the HPMP had not been completed and stated that the Commission should facilitate "an informed consultation". In its letter, the SHPO did not provide any comments on the content of the draft HPMP.

On January 25, 2022, FFP filed the draft HPMP (FFP, 2021b). This document provides a basic summary of cultural resources, including TCPs, the results of National Register evaluations and assessment of effects, and includes the following general management measures: (1) steps to designate a cultural resources coordinator; (2) procedures for review of activities requiring ground disturbance and a list of activities exempt from review; (3) procedures for reviewing activities with the potential to result in effects to historic properties, including additional surveys and/or expansion of the project APE as appropriate; (4) requirements for additional consultation with the SHPO(s); (5) plans for unanticipated discovery of archaeological resources and human remains; (6) requirements for annual reporting; (7) requirements for regular HPMP review and amendment; and (8) procedures for dispute resolution.

Additionally, the HPMP contains several "conceptual" measures that FFP indicates it might implement to resolve adverse effects on the National Register-eligible cultural resources (five archaeological sites and three TCPs). These conceptual measures include: (1) conduct surveys to identify areas where plant resources are gathered and implement a protection an enhancement plan for said resources; (2) allow Tribal members access to select areas for traditional purposes; (3) incorporate vegetation or other screening devices to lessen visual impacts to the viewshed; (4) partial redesign of the laydown areas, or incorporate protective (e.g., restrict ground disturbances through use of mats or other means) to minimize effects at sites

45KL567/570 and 45KL746); (5) conduct archaeological data recovery at site 45KL746, for which a draft treatment plan has been filed detailing a proposed data recovery research design (see Punke et al. 2021); (6) recover and curate artifacts for display and interpretation at a Tribal museum or museum like setting; (7) conduct cultural resources monitoring during construction using assigned construction monitors and enact safety measures to ensure security of monitors and surrounding communities, particularly Indigenous communities, (e.g., enforcing a no drugs and alcohol policy); (8) provide funding for oral history or other Tribal programs (e.g., support for the Umatilla Elder in Residence Program that documents important places and records the information in their oral history); (9) provide funding, recordation of digital content, or other efforts to support other tribal cultural or education programs or initiatives; (10) work with Tribal programs to conduct First Foods inventories to document areas where traditional foods may be harvested; and (11) purchase mitigation properties for Tribal ownership.

In response to the Commission's ready for environmental analysis notice, the Yakama expressed its continued objection to constructing the project because it would result in irreparable damage and destruction to the Yakama Nation's cultural resources and Treaty-reserved root gathering rights. The Yakama assert that no amount of mitigation could address the impacts of this project on their culture, or for future generations because of the sacredness of this resource. The Environmental Groups recommend that FFP ensure the protection of cultural resources and traditional cultural properties by developing a Cultural Resources Management Plan in consultation with and with the approval of all affected Tribes, including Yakama Nation, CTUIR, Nez Perce, and Warm Springs; and that FFP be required to obtain pre-approval of any project activities from all affected Tribes.

The other tribes did not file comments in response to the REA, but in their comments on the updated draft HPMP, they express similar concerns regarding (a) access and impacts to plants in the area that are gathered for traditional uses; (b) impacts to viewsheds and soundscapes in the region; (c) impacts to local communities; and (d) impacts to cultural resources, both archaeological and traditional. The Umatilla Tribes and Warm Springs Tribes both oppose data recovery and would prefer project redesign or other measures.

Our Analysis

Project construction activities would directly adversely affect historic properties through physical damage within the construction footprint and damage outside the project footprint through ground vibrations (e.g., toppling rock cairns) caused by earth-moving and heavy equipment. It would also result in permanent indirect visual effects that would alter the viewshed to or from a resource as it pertains to its setting and feeling and temporary visual, auditory, and atmospheric effects while heavy equipment and numerous personnel are present. Project construction could also uncover previously unknown historic properties within the construction footprint. Based on the current project design, project construction would entirely remove and destroy four sites (45KL567/570, 45KL2476, 45KL746, and 45KL744) and partially remove one site (45KL566). These sites, which include lithic scatters and rock features, are not uncommon, but are eligible for listing on the National Register. They also represent a significant part of the Yakama and other tribal traditions. Their removal could degrade the integrity and cultural significance of the TCPs and the larger Columbia Hills Archaeological District.

The TCPs (*Pushpum, Nch'ima, T'at'ałíyapa)* also would be impacted by construction of the Goldendale Project (FFP, 2022). Temporary effects would include visual, noise, and atmospheric effects from the use of heavy construction equipment and dust generated during project construction and possibly during subsequent operations and maintenance activities. Changes to the viewshed from project construction would be permanent. These changes would interfere with or degrade spiritual and ceremonial aspects of the tribe's use of the lands where they may still have access.

During project operation, only previously surveyed and assessed areas are expected to require periodic disturbance; therefore, the potential for additional physical effects to historic properties would be limited. If new resources are discovered during construction, operation or maintenance activities, FFP's HPMP includes a provision to stop all land-disturbing activities, contact the Washington SHPO, evaluate the effects and develop appropriate protection measures. For example, the existing private access road that would be used to access the upper reservoir was constructed to build TID's wind farm; therefore, it is likely that any cultural resources were already removed during its construction. However, if FFP needs to improve this road to accommodate construction vehicles and previously unknown resources are discovered, FFP would stop work, consult with Washington SHPO and affected tribes, and address any adverse effects.

Effects to the TCPs during operations would consist of a permanent change in viewshed near project facilities, and a periodic increase in noise, vibration, and dust created by vehicular traffic conducting operation and maintenance activities. As noted above, the effects could interfere with spiritual and ceremonial aspects of the tribe's use of the lands where they may still have access.

FFP's January 2021 draft HPMP contains general measures that are consistent with the Advisory Council and Commission's 2002 guidelines (Advisory Council and FERC, 2002) and should be adequate to mitigate adverse effects once the HPMP is finalized. However, the HPMP lacks details on how FFP would resolve adverse effects to the archaeological sites and the cultural significance of the TCPs important to the Tribes (Columbia Hills MPD, *Pushpum, Nch'ima,* and *T'at'ałíyapa*). In such circumstances, Commission staff typically recommends that the HPMP be revised in consultation with the SHPO and affected tribes and land managers, which in this case would include the Washington SHPO, the Umatilla, Nez Perce Tribe, and Yakama Tribes, and the Corps. To prevent unmitigated loss of cultural resources, the HPMP would need to be developed, approved by the Commission, and in place prior to any ground-disturbing actions.

Given the project design and location of the archaeological resources, FFP cannot redesign the project to avoid these sites, except possibly in the laydown areas where some adjustments may prevent removing all of sites 45KL567/570 and 45KL746. While preservation in place is generally preferred, data recovery, recordation, and curation for display and interpretation at a museum are frequently the only option for addressing adverse effects to sites that cannot be avoided. FFP's draft HPMP includes a treatment plan only for Site 45KL746. FFP included a treatment plan for this site because it has the potential to possess a data set that can answer important scientific research questions. The treatment measures proposed by FFP for this site would mitigate the adverse effect to this site to some extent. Developing treatment plans

for the remaining sites would mitigate the adverse effects to the remaining sites. Any such treatment plan should be consistent with the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716et seq.) and the Advisory Council's Handbook on the Treatment of Archaeological Properties. The treatment plans should provide for a research design and site-specific data recovery or other treatment and curation plans, including analysis and reporting and construction site monitoring.

Applying dust palliatives during construction as proposed in FFP's proposed erosion control plan would minimize dust generation. Incorporating vegetation screening into the project design may soften the lines of access roads but is not likely to minimize the visual effects of the reservoirs, because of the size of the embankments (the upper reservoir's embankment would be 175 feet high and the lower reservoir's embankment would be 205 feet high).

The addition of the upper and lower reservoirs would further alter the natural landscape, adding to the cumulative industrial effects created by wind turbines, John Day Dam, and the smelter. Changes to the natural landscape could interrupt Tribal cultural practices.

FFP's HPMP also includes employing a cultural resource coordinator that would ensure that construction personnel are aware of the cultural resources and that they coordinate activities with the Washington SHPO. To be effective, additional construction monitoring details need to be incorporated into the HPMP including: (1) identifying the specific areas that will be monitored; (2) the location of the National Register-eligible cultural sites to be avoided and how they will be marked and avoided where possible; and (3) protocols for training construction workers on the importance of cultural sites, how to identify cultural sites, the need to avoid damage to cultural sites, and procedures to follow if previously unidentified cultural sites, including Indian graves, are encountered during construction.

Regarding the other "conceptual" measures suggested by FFP, there is insufficient information to evaluate the efficacy of the measures, their benefits, estimated costs or their acceptance to the affected tribes. For example, it is not known whether there are other mitigation properties that could be purchased from willing sellers for tribal ownership that would contain resources appropriate for conducting cultural activities.

Further consultation with the Advisory Council, the Washington SHPO and participating Tribes is needed to determine appropriate treatment measures for each affected resource. The Commission intends to execute a PA with the Washington SHPO and the Advisory Council for the proposed project for the protection of historic properties that would be affected by project construction and operation. The terms of the PA would require FFP to address all adverse effects to all historic properties identified within the project's APE through implementation of a revised HPMP. The revised HPMP would include specific treatment measures for affected properties and would be developed in consultation with the Washington SHPO, Advisory Council, the Corps, and participating Tribes.

Effects on Access to Usual and Accustomed Gathering Sites

During scoping, the Yakama expressed concern that the project would affect access and use of the North Shore Treaty Fishing Access Site. In response to the Commission's REA

notice, the Yakama reiterated its concerns regarding project-related impacts to *Pushpum* and emphasized its Treaty-reserved rights to gather plants, fish, participate in important ceremonies, and pass on cultural traditions at the project location. The Yakama state that its "Treaty-reserved cultural and natural resources would be irrevocably damaged or destroyed due to the project construction and location" and reiterated its opposition to the project. In support, the Yakama state that its reserved right was observed by the State of Washington and the BPA for on-going root and plant gathering access by Yakama members in a programmatic agreement between BPA and the Washington SHPO.[59] The Yakama state that its members regularly access this site for root and medicine gathering, and to practice religious and cultural ceremonies.

FFP did not respond to these concerns in its REA reply comments, but does conceptually propose in its HPMP to provide support to tribal programs that would give access to tribal members to select areas within TCPs and/or provide support to tribal cultural programs related to oral histories, education, vegetation enhancement, first foods, etc.

Our Analysis

The proposed project would not be located on land that is directly adjacent to the Columbia River. Further, through-traffic on John Day Dam Road, which we understand is needed to access the traditional fishing site, would not be limited at any time during both construction and operation; therefore, based on the available information, access to the fishing site would not be affected by project construction and operation.

The *Pushpum* and *Nch'ima* areas are important to the Yakama and other tribes for a variety of culturally important purposes. Project construction would permanently remove 193.6 acres of land and disturb and additional 54.3 acres of land, some of which support plants that are gathered by Yakama tribal members for medical and other purposes. As noted in the revegetation discussion, taking steps to protect these plants where possible and including culturally important plants in the revegetation mix would help offset some of the loss, if tribes are able to access the site to gather the plants.

While the Yakama Treaty, the Treaty of Walla Walla, the Nez Perce Treaty, and the Treaty with the Tribes and Bands of Middle Oregon allowed the Tribes to retain hunting and gathering rights to open and "unclaimed" lands in the region, the lands that would have been subject to Columbia Wind Farm #1 access agreement (and now the Tuolumne Wind Project) are privately held, gated, and are not accessible to the public. Further, the lands on which the project

[59] The PA that the Yakama refers to was executed in 1997 between BPA, the Washington SHPO, the Advisory Council, and the Yakama Nation regarding a Power Purchase agreement that BPA would enter with Conservation and Renewable Energy System for the Columbia Wind Farm #1. A clause in the PA provides that BPA would ensure that Conservation and Renewable Energy System "makes a good faith effort to acquire an access easement on private lands in the APE from the landowner where construction occurs to allow members of the Yakama to conduct traditional plant gathering activities and other traditional uses." However, based on the Yakama's concerns and information from the Washington SHPO, it does not appear that such access was ever granted. Further, based on a review of Klickitat County's website it appears that the Columbia Wind Farm #1 was never constructed; therefore, the PA is not likely in effect.

is to be constructed are owned by NSC Smelter, LLC. NSC Smelter also is the landowner of a large part of the site leased to the Tuolumne Wind Project Authority ("TWPA") for its Tuolumne Wind Project, which is also located within *Pushpum*. According to NSC Smelter, with respect to *Pushpum*, "NSC [Smelter] owns no land between Hoctor Rd and NSC owned land, meaning the only way to access the ridgeline has always been through unrelated third party owned land. While NSC [Smelter] does own the land immediately north of Highway 14 that leads to the ridgeline, this land is not accessible by vehicle or foot due to the extreme slope and unstable rocks."[60] Based on interviews with Yakama tribal elders, Shellenberger et al. (2019) indicate that current use of *Pushpum* in unknown but acknowledges that "landowners near the existing wind power project have reported that Indian people gathered roots there until the last 10–20 years."

While the Commission could require that FFP allow tribal access to project lands for traditional purposes where it is safe to do so, the Commission does not have the authority to require access across non-project lands. Granting access to revegetated project lands to gather culturally important plants and First Foods where it is safe to do so would help offset some of the loss of available lands for that purpose, but this may not be desirable to the Yakama and other tribes because of the presence of the project facilities. While there would be 92.36 acres less land within *Pushpum* on which to gather plants, access to the remainder of the lands associated with *Pushpum* for traditional tribal purposes is not expected to change if a license is issued to construct the project because the Yakama and other tribal members would still need to work with adjoining private landowners to gain access.

As discussed in the recreation analysis, BIA manages the North Shore Treaty Fishing Access Site adjacent to the Corps next to Railroad Island boat launch. Although closing the John Day Dam Road to construct the lower reservoir is not anticipated, coordinating any closure or delays with the Corps, BIA, and affected Tribes through the Columbia River Inter Tribal Fish Commission would minimize any disruption to Tribal access and use of the fishing site.

Effects on Historic Resources

FFP's proposed lower reservoir would be constructed approximately 0.5 miles northwest of the John Day Lock and Dam Historic District facilities at the former location of the West Side Surface Impoundment. While parts of the substation and transmission lines would be visible from the John Day Lock and Dam Historic District, for the most part, these facilities would be located within the existing BPA transmission line corridors. In its historic structures memorandum (Perrin, 2021), FFP concluded that the construction of the proposed project would not directly impact any of the historic district facilities and was not anticipated to be located within its viewshed. Thus, FFP concluded that construction of Goldendale Project would not alter the physical character of the historic district, nor its relationship to surrounding features and recommended a finding of no adverse effect to the historic district.

FFP proposes to co-locate a 500-kV transmission line within the existing BPA transmission line ROW for the Rock Creek–John Day No. 1 transmission line and then

[60] Letter from NSC Smelter, LLC to Kimberly Bose, Secretary, Federal Energy Regulatory Commission filed July 7, 2022.

interconnect to BPA's John Day Substation. In its historic structures memorandum (Perrin, 2021), FFP stated that construction of proposed facilities would not indirectly alter the physical character of either the John Day Substation or the Rock Creek–John Day No. 1 transmission line. Direct alterations to the substation (via a tap connection) would be consistent with the use of the substation and would have no potential to result in adverse effects. In its conclusion, FFP concluded that construction of the project would not result in adverse effects to the John Day Substation or the Rock Creek–John Day No. 1 transmission line.

On September 29, 2021, FFP submitted the results of the historic structures study to the Oregon SHPO and Washington SHPO and requested concurrence on its recommendations of no adverse effect to historic structures. In letters dated October 29, 2021, and September 30, 2021 (both filed January 25, 2022) respectively, the Oregon SHPO and Washington SHPO concurred with these recommendations.

Our Analysis

For the reasons explained by FFP above, we agree that project construction and operation would not adversely affect any historic structures or the John Day Lock and Dam Historic District.

3.3.8.3 Cumulative Effects

The Tribes of the Columbia River have been inextricably connected to the lands associated with the proposed project since time immemorial.

The Tribes have been greatly affected by numerous actions undertaken in the region over time that have damaged cultural resources, restricted fish migration, and curtailed or eliminated their ability to access and use the lands for traditional purposes. These actions include, but are not limited to, direct and indirect effects of the construction of the Columbia River dams and local wind farm projects. The construction of John Day Dam in 1972 resulted in the inundation of village sites, fishing locations, and other important locations. The construction of nearby wind farms such as the Windy Point I (Tuolumne), Windy Point II, and Linden projects likely resulted in the loss of artifacts and have resulted in additional changes to the landscape that changed the cultural setting and value of the TCPs. The CGA smelter, located on the banks of the Columbia River, which operated from 1971 to 2003, likely also resulted in the loss of cultural resources and adverse effects on the TCPs. Klickitat PUD's water pumping station was constructed in 1970 to supply water to the smelter. Klickitat PUD is expected to continue to supply water from the pumping station to support industrial development regardless of whether the Goldendale Project is constructed. The construction of new energy sources such as solar projects (see Tetra Tech, 2018) and the Goldendale Project would result in additional significant loss of culturally important archaeological sites and access to important food gathering sites.

The natural landscape of the Columbia Hills area has been modified by the installation of John Day Lock and Dam, CGA smelter, Klickitat PUD's pumping station, nearby wind farms, and other associated infrastructure. Together these industrial projects have diminished the nature of the area for traditional tribal uses. The construction of the Goldendale project facilities would further contribute to cumulative impacts on historic properties and tribal resources.

3.3.9 Socioeconomics

The geographical scope of analysis for socioeconomics includes both Klickitat and Sherman Counties. This study area was chosen because it is where project-induced social and economic effects are likely to be highest due to their proximity to the project, from the influx of the workforce during construction on county services, and potential changes in tax revenues.

3.3.9.1 Affected Environment

Population Characteristics and Housings

The study area includes the City of Goldendale, Washington and the rural areas of Klickitat County, Washington, and Sherman County, Oregon.

Per the 2020 U.S. Census results, Klickitat County has a population of 22,735 people and Sherman County has a population of 1,870. Between 2010 and 2020, the total population of Klickitat County increased by 11.9%, and the population of Sherman County increased by 5.9%. The total population within the two-county study area increased by 11.4% between 2010 and 2020 (table 3.3.9-1).

The largest racial group in the study area is white, representing approximately 92.9% of the study area's population. The American Indian and Alaska Native population is approximately 2.6% of the study area's population. Notably, many of the American Indian and indigenous Native American population in Goldendale are from the Confederated Tribes and Bands of the Yakama Nation, a federally recognized Tribe. The Yakama Indian Reservation is located north of Klickitat County and east of the Cascade Mountains.

Between 2016 and 2020, the average household size was 2.35 persons per owner-occupied household in Klickitat County and 2.30 in Sherman County. There was a total of 11,531 housing units located in Klickitat and Sherman Counties. The rental vacancy rate for Klickitat County, Washington was 13%, and the rental vacancy rate for Sherman County, Oregon, was 20% (see table 3.3.9-1 and table 3.3.9-3).

Employment and Income

The unemployment rate in Klickitat County is 5.1% (as of May 2022), and Sherman County is 2.6% (as of May 2022). Prior to the start of the COVID-19 pandemic, the unemployment rate was 4.26% in 2019. In 2020 it rose to 8.28% and dropped to 5.18% in 2021. As of May 2022, the unemployment rate in Klickitat County is 4.22%, lowest in the past 4 years. Similarly, in Sherman County, the unemployment rate rose from 3.46% in 2019 to 6.19% in 2020, then dropped to 4.27% in 2021 and as of May 2022, it is at 3.32%.

Median household income in both counties is below their respective state's average. Klickitat County had a five-year average median household income (2016–2020) of $56,667, below the State's average of $77,006. Sherman County had a five-year average median household income (2016–2020) of $51,472, below the state's average of $65,667.

Local Industry

In Klickitat County, the three industries with the greatest percentage of total county employment are manufacturing (particularly production of unmanned aerial vehicle products) (25.2%); agriculture, forestry, fishing and hunting (20.1%); and retail trade (5.2%) (Washington ESD, 2022). The recent increase in wind-powered energy, development of the Roosevelt Regional Landfill, and evolving leisure and hospitality industry have contributed to the region's economic diversity and new jobs. Specifically, job growth within the unmanned aerial vehicle industry has seen the most growth in recent years and is expected to play an important role in Klickitat County (and across the Columbia Gorge as a whole) going forward., along with agriculture, wood products, and tourism/recreation.

In Sherman County, the three industries with the greatest percentage of total county employment are agriculture, forestry, fishing and hunting (18.2%); healthcare and social services (11.0%); and educational services (9.4%).

Tax Base and Revenue

Table 3.3.9-2 shows the total tax revenues for the past three available fiscal years (2017–2020) for the two-county study area. Notably, Klickitat County, Washington; the City of Goldendale, Washington; and City of Wasco, Oregon experienced modest economic growth over the last several years, while Sherman County, Oregon experienced an economic contraction.

3.3.9.2 Environmental Effects

Project construction and operation could affect socioeconomic resources in the project area by placing greater demands on public infrastructure and services and by stimulating the local economy through increased tax payments and salaries. Increase demands on public infrastructure arises from the influx of construction workers and increased traffic levels.

In response to the Commission's ready for environmental analysis notice, Klickitat County expressed concerns with elevated construction traffic on county roads. Klickitat County recommends that FFP evaluate the adequacy the County roads and bridges, if any, that would be used as haul routes during project construction. That analysis should follow the counties' Geotechnical Guidelines and report the timing the time of year that hauling for construction can occur. If the results show that the roads or bridges on the haul routes are not adequate to support the loads during construction, Klickitat County says mitigation will be required prior to the start of any hauling operations. Klickitat County states that a formal Haul Route Agreement with Klickitat County will be required prior to the start of construction and that all materials placed on County roads shall meet the requirements for materials and placement in the most current version of the Washington DOT, Standard Specifications for Road, Bridge, and Municipal Construction. Klickitat County adds that any new driveways or intersections that access onto County roads will require an access permit through the County Public Works Department prior to construction and that Financial Security is required with a formal "Road Haul Agreement" prior to construction to address road maintenance issues and potential damages that arise during construction. Klickitat County states that FFP will also be required to address dust concerns on their haul routes if applicable.

FFP did not propose any measures to address the effects of a temporary population increase due to an influx of project construction workers. In its reply to Klickitat County, FFP states that it will work with the county to obtain an agreement for haul routes and other road use actions as needed for construction. FFP also proposes in its license application to develop a construction traffic management plan containing applicable traffic control measures (e.g., signage, flaggers at key intersections, reduced speed limits or other speed control devices, controlled or limited access routes) and protocols for coordinating construction schedules, any temporary road or lane closures, and any traffic control measures with Washington DOT and Klickitat County to minimize disruption of traffic on public roads

Our Analysis

Housing Impacts

The closest city/town to the project location is the City of Goldendale, Washington (19 miles). Other nearby communities expected to provide potential housing to project workers are Centerville, Washington (19 miles); Wishram, Washington (17 miles); Rufus, Oregon (17 miles); and The Dalles, Oregon (31 miles). Housing and housing vacancy rates are provided in table 3.3.9-3.

During the peak of the 5-year construction period, FFP estimates that it would employee about 800 construction workers. They are expected to reside in local residences, rentals, RV parks, and motels.

Rental vacancy rates are anticipated to be adequate to accommodate the in-migration of permanent project personnel. For construction personnel, most of them are expected to be relocating to the region on a temporary basis and most are expected to travel and stay in recreational vehicles, as is common practice for construction projects in remote areas. The number of RV sites needed during construction is anticipated to range from a high of 107 in year 2 and a low of 18 in year 5. There are seven state and private RV parks within 20 miles of the site with a combined 409 available sites. Other workers are anticipated to either commute or find temporary housing from available rental units in nearby communities. There would be no residence or business establishments displaced by the proposed project and there appears to be sufficient accommodations available to support the workforce.

Effects on Local Economy, Employment, and Government and Services

Given the magnitude and scale of the project, additional employment and income would be generated in the surrounding areas, including in Klickitat County and Sherman County.

FFP commissioned an economic impact analysis of the project on the local and state economy. Economic impact estimates were calculated using the IMPLAN Economic Impact Analysis for Planning model, whereby direct impacts, indirect impacts, and induced impacts from the project were analyzed and quantified. Direct impacts from the project include jobs and income to the construction and operations workers at the project site. Indirect impacts include jobs and income resulting from the purchase of goods and services for the site (including from legal and environmental services to tires, equipment, and electricity). Induced impacts include jobs and income resulting from the increased household spending—as employees earn increased

wages due to the project, they spend their increased income at stores, on healthcare and real estate, and at service establishments such as restaurants. These expenditures result in increased jobs and income at those businesses.

In Klickitat County, during each of the five years of construction, the project would likely provide $11.0 million in annual income. During the operation phase, the project would likely support 25 jobs and $3.6 million in annual income. Based on historical data on sales and use taxes paid by the power and communications construction sectors, total sales and uses taxes paid by the project may be approximately $12.3 during construction of the project. Sales taxes paid by suppliers may be as much as $25.5 million, for a potential total of $37.8 million in tax revenues during construction. The fraction that may go towards Klickitat County would be approximately $2.7 million. During operation phases, the total annual sales and use taxes paid by the project is estimated to be anywhere from $0.5 million to $1 million.

The state of Oregon does not have a sales tax but instead has an income tax. During construction of the project, an estimated $270 million would be paid to workers residing in Oregon or outside Klickitat County, Washington. If half of the workers would reside in Oregon during the construction of the project, then about $8 million total would be paid in state income taxes over the course of the construction period, or about $1.6 million annually. During operations, income tax to Oregon would be approximately $300,000 annually. Based on available information, project construction and operation are not expected to place undue and significant burdens on local and state infrastructure and services.

Effects on Roads and Traffic

Access to the proposed project area during construction would be provided by existing public and private access roads. No new construction or upgrades to existing public access roads are anticipated; however, improvements to the private access roads maybe required to accommodate construction equipment.

SR 14 is a major east-west state route that runs along the north side of the Columbia River. SR 14 varies between two and four lanes and is used for the movement of people and goods. Access to the lower reservoir site would be provided from the John Day Dam Road, off SR 14, and from approximately 0.7 mile of existing private access roads associated with the CGA smelter site. John Day Dam is a two-lane road that becomes a series of paved/improved and unimproved roadways that snake around to the dam as well as the Harvalum substation.

Access to the upper reservoir would be provided from Hoctor Road and would use approximately 8.6 miles of existing private roads associated with the Tuolumne Wind Project Authority wind farm. Hoctor Road is a two-lane paved road with about 20 homes within 100 feet of the road and another 12 that are 200 to 500 feet of the road. From the turn-off from Hoctor Road, a private unimproved gravel access road designed for the construction and operation/maintenance of the wind farm would be used to access the upper reservoir. Land use along Hoctor Road is agricultural-cropland and rangeland/pastures; therefore, traffic volumes are light. The Klickitat County Rural 7 Fire and Rescue Station #3 is also along Hoctor Road about 7 miles east of HWY 97. Goldendale School District No. 404 buses use various roads throughout the County, including SR 14 and Hoctor Road (Washington Ecology, 2022a).

FFP states that portions of the private access roads to the upper and lower reservoirs would be upgraded as necessary to accommodate construction vehicles. Improvements to the access roads would ensure roads are 30 feet wide to allow for two construction vehicles to travel in opposite directions; a maximum grade of 10% is provided; and a minimum curve radius of 100 feet is considered. The private access roads that would be used to reach the upper and lower reservoir sites are not currently accessible by the public.

Temporary road closures during construction would be required. SR 14, Hoctor Road, and other roads could also be subject to detours and additional traffic due to construction of the proposed project. In its wildlife management plan, FFP commits to limiting construction to the period of 8 am to 6 pm, which would minimize traffic delays at night.

Construction of the proposed project would require truck, equipment, and employee vehicle trips to and from the project area. Construction would require anywhere between 126 and 805 construction workers, depending on the construction phase. This would likely result in an average of 826 daily trips spread throughout roads in the project area, which could result in temporary or sporadic increased traffic volumes. No information is available on traffic volume on Hoctor Road. Given the rural character and land use along Hoctor Road, increased construction traffic is likely to be noticeable to residents along Hoctor Road. Annual average traffic volume for SR 14 is about 1,200 vehicles (Washington Ecology, 2022a), thus construction traffic as discussed below could result in noticeable delays to the movement of people and goods along SR 14.

Excavation and removal of soils for the upper and lower reservoir would also increase heavy truck usage on local roads. Based on FFP's reported excavation and fill requirements, Washington DOE (2023) estimates that approximately 71,600 to 114,600 dump truck trips to and from the proposed project would be needed over the 5-year construction period, depending on the size(s) of trucks used. This would equate to approximately 55 to 90 truck trips per day, depending on the size(s) of the dump truck used. Washington DOE (2022a) also concluded that the addition of 55 to 90 daily haul truck trips on routes to available landfills during construction would result in increases in daily traffic ranging from 1% and 8% depending on the route. Because it is likely that multiple landfills and fill sources would be used, the number of daily haul truck trips will likely be spread across routes, resulting in less concentrated increases in traffic.

The increased worker and construction traffic has the potential to result in temporary road closures and delays, interruption of normal traffic patterns, and potentially causing different routes within the transportation network to be used to ensure the adequate movement of people and goods. Coordinating the construction schedule and developing a traffic management plan in coordination with the state and county would minimize traffic delays. With appropriate management and planning these effects are not expected to be significant.

Approximately 40 to 60 employees would be employed to operate the project, not all of which would be onsite at once. Assuming each employee would work a single shift every day and would operate a single-occupant vehicle, operation of the proposed project would contribute approximately 80 to 120 daily trips to the area. This would represent a negligible increase in

traffic and there would be no significant adverse impacts with respect to traffic interference and congestion during operation.

Summary

Based on available information, project construction and operation are not expected to place undue and significant burdens on local and state infrastructure and services and would have a positive effect on local and state economies.

3.3.10 Environmental Justice

The Commission follows Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, as amended, which directs federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" of their actions on minority and low-income populations (i.e., environmental justice communities).[61]

Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*,[62] also directs agencies to develop "programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts. Environmental justice is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."[63]

According to EPA, "environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means that no group of people should bear a disproportionate share of the adverse environmental effects resulting from industrial, governmental, and commercial operations or policies (EPA, 2021b). Meaningful involvement means: (1) people have an appropriate opportunity to participate in decisions about a proposed activity that has the potential to affect their environment and/or health; (2) the public's contributions can influence the

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[61] Exec. Order No. 12898, 59 Fed. Reg. 7629, at 7629, 7632 (Feb. 16, 1994). While the Commission is not one of the specified agencies in Executive Order 12898, the Commission nonetheless addresses environmental justice in its analysis, in accordance with our statutory duties.

[62] Exec. Order No. 14008, 86 Fed. Reg. 7619, at 7629 (Jan. 27, 2021). The term "environmental justice community" includes disadvantaged communities that have been historically marginalized and overburdened by pollution. The term also includes, but may not be limited to, minority populations, low-income populations, or indigenous peoples.

[63] EPA, *Learn About Environmental Justice*, https://www.epa.gov/environmentaljustice/learn-about-environmental-justice#:~:text=Environmental%20justice%20(EJ)%20is%20the,environmental%20laws%2C%20regulations%20and%20policies.

regulatory agency's decision; (3) community concerns will be considered in the decision-making process; and (4) decision-makers seek out and facilitate the involvement of those potentially affected (EPA, 2021b).

3.3.10.1 Meaningful Engagement and Public Involvement

The Council on Environmental Quality's (CEQ) *Environmental Justice Guidance Under the National Environmental Policy Act* (CEQ, 1997) and Federal Interagency Working Group on Environmental Justice & NEPA Committee's publication, *Promising Practices for EJ Methodologies in NEPA Reviews* (*Promising Practices*) (EPA, 2016), recommend that federal agencies provide opportunities for effective community participation in the NEPA process, including potential effects and mitigation measures in consultation with affected communities and improving the accessibility of public meetings, crucial documents, and notices. They also recommend using adaptive approaches to overcome linguistic, institutional, cultural, economic, historical, or other potential barriers to effective participation in the decision-making processes of federal agencies. In addition, section 8 of Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, strongly encourages independent agencies to "consult with members of communities that have been historically underrepresented in the federal government and underserved by, or subject to discrimination in, federal policies and programs."[64]

In 2021, the Commission established the Office of Public Participation (OPP) to support meaningful public engagement and participation in Commission proceedings. OPP provides members of the public, including environmental justice communities, with assistance in FERC proceedings—including navigating Commission processes and activities relating to the project. For assistance with interventions, comments, requests for rehearing, or other filings, and for information about any applicable deadlines for such filings, members of the public are encouraged to contact OPP directly at 202-502- 6595 or OPP@ferc.gov for further information.

The administrative record for this proceeding is available to the public on FERC's e-library website (https://elibrary.ferc.gov/eLibrary/search) and interested parties may comment about the project, either in writing or electronically. There have been opportunities for public involvement during the Commission's environmental review processes, though the record does not demonstrate that these opportunities were targeted at engaging environmental justice communities. FFP complied with the Commission's regulations pertaining to landowner and public notification requirements and federally recognized Indian tribes were notified about the project. FERC's communication and involvement with the surrounding communities continued with the Notice of Intent to prepare an EIS which was issued in June 2022, with a schedule update in February 2023. Notices were mailed to the parties on FERC's environmental mailing list, which included Federal and state resource agencies; elected officials; environmental groups and non-governmental organizations; Indian Tribes; potentially affected landowners; local newspapers; and other stakeholders who had indicated an interest in the project.

[64] Exec. Order No. 13985, 86 Fed. Reg. 7009 (Jan. 20, 2021).

3.3.10.2 Affected Environment

Consistent with CEQ[65] and EPA[66] guidance and recommendations, we consider: (1) whether environmental justice communities (e.g., minority or low-income populations) exist in the project area; (2) whether impacts on environmental justice communities are disproportionately high and adverse; and, if so, (3) what mitigation measures might be needed.

CEQ's *Environmental Justice Guidance* also recommends that low-income populations be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau (Census; CEQ, 1997). Using *Promising Practices*' low-income threshold criteria method, low-income populations are identified as block groups where the percent of low-income population in the identified block group is equal to or greater than that of the county. Using this methodology, minority populations have been defined as where either: (1) the aggregate minority population of a block group in the affected area exceeds 50%; or (2) the aggregate minority population in a block group affected is 10% higher than the aggregate minority population percentage in the county.[67]

To identity potential environmental justice communities for the analysis presented here, Commission staff used 2020 U.S. Census American Community Survey data[68] for the race, ethnicity, and poverty data at the block group level. Additionally, in accordance with *Promising Practices*, staff used EJScreen, EPA's environmental justice mapping and screening tool, as an initial step to gather information regarding minority and low-income populations; potential environmental quality issues; environmental and demographic indicators; and other important factors.

Once we collected the block group level data, as discussed in further detail below, we conducted an impacts analysis for the identified environmental justice communities and evaluated relevant health or environmental hazards; the natural physical environment; and associated social, economic, and cultural factors to determine whether impacts to environmental justice communities are disproportionately high and adverse. For this project, we determined both whether impacts were disproportionately high and adverse on environmental justice

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[65] CEQ, *Environmental Justice: Guidance Under the National Environmental Policy Act* 4 (Dec. 1997) (CEQ's Environmental Justice Guidance), https://www.energy.gov/sites/default/files/nepapub/nepa_documents/RedDont/G-CEQ-EJGuidance.pdf.

[66] *See generally* EPA, *Promising Practices for EJ Methodologies in NEPA Reviews* (Mar. 2016) (Promising Practices), https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

[67] Here, we selected "county" as the comparable reference community to ensure that affected environmental justice communities are properly identified.

[68] U.S. Census Bureau, American Community Survey 2016-2020 ACS 5-Year Estimates Detailed Tables, File# B17017, Poverty Status in the Past 12 Months by Household Type by Age of Householder, https://data.census.gov/cedsci/table?q=B17017; File #B03002 Hispanic or Latino Origin By Race, https://data.census.gov/cedsci/table?q=b03002.

populations and whether those impacts were significant.[69] We assessed whether impacts to an environmental justice community were disproportionately high and adverse based on whether those impacts were predominately borne by that community, consistent with recommendations in *Promising Practices.*[70]

The environmental justice analysis for the Goldendale project spans three different counties: Klickitat County in Washington (6 census block groups total), Gilliam County in Oregon (one census block group total), and Sherman County in Oregon (one census block group total). Each county was used as the reference community for the environmental justice analysis. For this project, we chose a 5-mile radius around the project boundary as the area of study. A 5-mile radius is the appropriate unit of geographic analysis given the location of project facilities, proposed construction, and the inclusion of all census block groups that border the Goldendale project. According to the current U.S. Census Bureau information and consistent with the 50%, meaningfully greater analysis, and low-income threshold criteria described above, staff identified 7 environmental justice communities within the 5-mile buffer of the project area: Census Tract 9501.01, Block Group 1; Census Tract 9501.02, Block Group 2; Census Tract 9501.03, Block Group 1; Census Tract 9501.03, Block Group 2; Census Tract 9502, Block Group 1; Census Tract 9501, Block Group 2; and Census Tract 9601, Block Group 1 (*see* figure 3.3.12-1 in Appendix A). Of these environmental justice communities, 5 meet the criteria for households in poverty, while 4 of these communities meet the criteria for minority populations (*see* tables 3.3.10-1 and 3.3.10-2 in Appendix B). Only two of these census block groups meet the criteria for both households in poverty and minority populations (Census Tract 9501.01, Block Group 1 in Klickitat County, WA, and Census Tract 9501, Block Group 2 in Sherman County, OR).

3.3.10.3 Environmental Effects

Project construction would require constructing the lower and upper reservoir, underground conveyance tunnel systems, an underground powerhouse, an underground transformer cavern (transformer gallery), tunnels, a buried water fill line, and appurtenant facilities (*see* 2.2.1 *Project Facilities* and corresponding figure 1.1-1). During construction, equipment such as transmission tower components, large trucks, drilling and grading equipment, cranes, and equipment for stringing the transmission line on BPA's existing structures would be visible. Once constructed, the reservoirs, 230-kV transmission line, and substation would be visible from certain viewpoints, with the most prominent features being the upper and lower reservoirs. No entity provided comments or recommendations regarding the effects of the

[69] *See Promising Practices* at 33 (stating that "an agency may determine that impacts are disproportionately high and adverse, but not significant within the meaning of NEPA" and in other circumstances "an agency may determine that an impact is both disproportionately high and adverse and significant within the meaning of NEPA").

[70] *Id*. at 44-46 (explaining that there are various approaches to determining whether an action will cause a disproportionately high and adverse impact, and that one recommended approach is to consider whether an impact would be "predominantly borne by minority populations or low-income populations"). We recognize that EPA and CEQ are in the process of updating their guidance regarding environmental justice and we will review and incorporate that anticipated guidance in our future analysis, as appropriate.

project on environmental justice communities in response to the Commission's notice that the application was ready for environmental analysis. During scoping, the Environmental Groups requested that the Commission examine impacts on environmental justice communities, and we do so below.[71]

We have identified the following resources that would be affected by project construction or operation and that would in turn affect environmental justice communities: air quality (section 3.3.11), noise (section 3.3.12) and visual resources (section 3.3.7).

Our Analysis

Project-related construction, operation, and maintenance activities would occur entirely within environmental justice communities Block Group 1, Census Tract 9501.03 in Klickitat County, Washington, and Block Group 2, Census Track 9501 in Sherman County, Oregon.

Air Quality

Construction of the project would result in temporary emissions of criteria pollutants. These emissions generally include fugitive dust (PM10 and PM2.5) generated from ground-disturbing activities, such as soil excavation and wind erosion of disturbed areas, and vehicle traffic during construction. Operation of diesel- and gasoline-fueled construction equipment would also emit criteria pollutants such as NOx and CO. Combustion emissions and fugitive dust can create respiratory distress or agitate pre-existing conditions like asthma. Effects of reduced air quality could be slightly greater for each identified environmental justice community because the communities are in a medically underserved area[72] and because EJScreen indicates the incidence of adult asthma in this location at the tract level is relatively high (with 5 of the 7 environmental justice communities reporting in the 80^{th} – 90^{th} percentile).

Construction-related emissions at the project would occur within environmental justice communities over the 5-year construction period and would dissipate with distance from areas of active construction. Emissions would be the greatest during the first 3 years of construction when land clearing activities are being conducted. The effects would be the greatest to those residences closest to the project. The closest residence to the upper reservoir construction site is about 1 mile northwest on Oak Hill Road and the closest residence to the lower reservoir site is located about 0.3 miles west along Washington State Route 14. Further, construction emissions would subside once construction is complete. The use of dust control measures as proposed in FFP's soil erosion control plan would minimize the amount of dust emitted within environmental justice communities. Therefore, because construction emissions would be temporary and

[71] Environmental Groups. Dec. 28, 2020. Comments at 21.

[72] Medically underserved areas/populations are areas or populations designated by US Health Resources & Services Administration as having too few primary care providers, high infant mortality, high poverty or a high elderly population. More information can be found at: Health Resources & Services Administration https://bhw.hrsa.gov/workforce-shortage-areas/shortage-designation#mups.

minimized, project construction would have less than a significant impact on air quality in environmental justice communities.

Noise

Construction activities would temporarily increase noise in the environmental justice communities during the 5-year construction period, with the greatest effects occurring during the first 3 years associated with land clearing activities. The proposed project is in a sparsely populated area. The closest known residents to the upper reservoir site are located approximately 1 mile to the northwest on Oak Hill Road, and approximately 2 miles to the north on Hoctor Road. The closest residence to the lower reservoir site is located off Washington State Route 14 approximately 0.3 miles to the west, and additional residences are located further west on Highway 14, and in Rufus, Oregon, a town approximately 1.5 miles to the southwest, across the Columbia River.

Construction activities would be performed with standard heavy equipment such as track-excavators, backhoes, cranes, bulldozers, concrete trucks, and dump trucks. Noise would also be generated by trucks and other light vehicles traveling in and near construction areas. The changing number and type of construction equipment at construction sites would result in varying levels of noise. Noise levels in environmental justice communities would be highest at residences in the immediate vicinity of construction activities, such as the residence along SR 14, and would diminish with distance from the work areas. At the peak of construction, noise levels are not expected to significantly rise above ambient levels at the closest residences because sound levels are not expected to exceed 55.3 dBA. Sound levels of 55.3 dBA would be comparable to noise levels from normal conversation and while noticeable, should not be significantly louder than ambient conditions. Further, existing noise sources regularly include machinery noise from trucking, wind farm operations, and agricultural practices. Thus, construction noise is likely to be perceived at the residences but are not expected to rise to a level that would be annoying or disruptive. In addition, FFP's proposal to limit construction to the hours of 8 am to 6 pm to protect crepuscular wildlife would in turn minimize effects on nearby residences by confining the construction activities to the daytime. Therefore, the noise effects of project construction on nearby residents within the environmental justice communities would be less than significant.

As discussed in Section 3.3.1.2, once the project is operating, noise levels are expected to be negligible. Noise generated from the turbine-generator system would be the greatest source of operational noise. The loudest noise levels would be associated with the powerhouse which will be underground. Given the attenuation rates and that the powerhouse is located underground, noise levels would not contribute to elevated ambient noise beyond 500 feet of the substation. Therefore, the impact on environmental justice communities would be less than significant.

Visual Resources

With respect to visual effects on environmental justice communities, project construction activities and the project reservoirs, substation, and transmission line would be visible by members of the environmental justice communities, primarily as they traverse local roads.

Construction activities would be visible for 5 years. The upper and lower reservoir, substation and overhead transmission line would be permanent introductions to the viewshed. Other project features would not be visible because they would be underground. The most prominent features would be the upper and lower reservoirs, with the lower reservoir being within 0.3 mile of the closest residence. Visibility of the upper and lower reservoirs would be partially screened by vegetation and topography. The project transmission line would be co-located within BPA's existing transmission corridor so that it would be consistent with existing features.

FFP's proposed measures to reduce visual effects (e.g., use of vegetation screening, natural paint colors and surfacing materials that match the surrounding landscape and dull reflective surfaces that cannot be painted, and designed facility lighting) would reduce the contrast of the project facilities with landscape to the extent practicable, and reduce visual effects to less than significant levels.

Determination of Disproportionately High and Adverse Impacts on Environmental Justice Communities

In consideration of the included census data, scope of the proposed project, and the environmental protection and enhancement measures for noise, air quality, and aesthetics we conclude that the adverse effects of the project on these resources would predominately be borne by environmental justice communities and would result in a disproportionately high and adverse effect on environmental justice communities. Construction related effects would be limited to the 5-year construction period while visual effects would be permanent. All the effects would be at a level that is less than significant with appropriate mitigation (e.g., erosion and dust control, and vegetation screening, lighting, and painting to reduce the contrast with the landscape).

3.3.11 Air Quality and Climate Change

3.3.11.1 Affected Environment

Air quality is generally good in the project area. The primary emission sources from human activity in the study area include vehicle combustion, regional home and building heating, electrical generation, and industrial operations. The primary drivers of these emissions are fossil fuel combustion and particulates that are generated from both combustion and material disturbance.

The Clean Air Act of 1970 and its amendments led to the creation of National Ambient Air Quality Standards (NAAQS) by the U.S. Environmental Protection Agency (EPA) for six criteria air pollutants: CO, sulfur dioxide (SO2), ozone, PM, nitrogen dioxide, and lead. There are two types of NAAQS: (1) primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly; and (2) secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Washington DOE implements source permitting requirements under Washington Administrative Codes (WAC) 173.400, 173.401, and 173.460 to regulate source permit requirements, emissions controls, and regulatory requirements based on source class and source operating requirements. Washington DOE additionally implements State Ambient Air Quality Standards under WAC 173.476.

The status of criteria pollutants in an area is described by three main categories (EPA, 2021c): (1) "attainment" (areas in compliance with the NAAQS); (2) "nonattainment" (areas not in compliance with the NAAQS); or (3) "unclassifiable" (where EPA is unable to determine the status based on the available information). Unclassifiable areas are treated as attainment areas for the purpose of permitting a stationary source of pollution. Areas that have been designated nonattainment but have still demonstrated compliance with the ambient air quality standard(s) are designated "maintenance" for that pollutant. Areas that have never been designated non-attainment for a pollutant and NAAQS are considered attainment areas.

Section 176(c) of the Clean Air Act (CAA) prohibits federal agencies from taking actions in nonattainment and maintenance areas unless the emissions from the actions conform to the state or tribal implementation plan for the area. Federal actions that cause emissions only in areas not designated as nonattainment or maintenance, such as attainment or unclassified areas, are not required to evaluate conformity with a state or tribal implementation plan for the action. The project would be in Klickitat County Washington. The project is located within an area designated Attainment or Unclassifiable for all criteria pollutants (EPA, 2021) and no implementation plans have been developed for the area. As such, evaluation of conformity with such plans is not applicable for the proposed project.

The term "greenhouse gases" (GHGs) refers to certain gases and aerosols that occur in the atmosphere both naturally and because of human activities, such as the burning of fossil fuels. GHGs are non-toxic and non-hazardous at normal ambient concentrations; however, they were identified as pollutants by the EPA because it determined that the current and projected concentrations of these gases in the atmosphere threaten the public health and welfare of current and future generations through climate change. There are six long-lived and directly emitted GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Of these, CO_2, CH_4, and N_2O would be emitted during project construction due to the burning of fossil fuels for operation of construction equipment. There are no NAAQS or other significance thresholds for GHGs.

In 2018, Washington produced about 99.57 million gross metric tons of CO2e from the following sources (Washington DOE, 2021): 44.9% from transportation; 23.4% from residential, commercial, and industrial heating; 16.3% from electricity generation (both in-state and out-of-state); and 15.4% from agriculture, waste management, natural gas distribution, and industrial processes.

3.3.11.2 Environmental Effects

Construction activities that use various heavy equipment (heavy haul trucks, light duty truck, cranes, dozers, etc.) would result in localized emissions of criteria pollutants through fugitive dust and vehicle exhaust. FFP states that two concrete batch plants would be erected on-site to produce concrete for the project: one at the upper reservoir and on at the lower reservoir. These plants would be sources of particulate emissions during three of the five years of construction. According to FFP, the anticipated capacity of the batch plants as 70,000 tons per year for the upper reservoir plant and 130,000 tons per year for the lower reservoir plant. Vehicle emissions sources would also emit GHGs. Construction air emissions would occur over approximately 5 years and would occur at various times throughout the construction period.

FFP proposes to implement BMPs such as applying dust palliatives to disturbed areas; covering haul trucks transporting soil, sand, or other loose material on the site; minimizing idling time by either shutting equipment off when not in use or reducing idling time to 5 minutes; establishing protocols for equipment inspection and maintenance programs to ensure work and fuel efficiencies to ensure air quality impacts are minimized.

Our Analysis

Criteria Pollutants

Washington DOE commissioned an air quality and greenhouse gases resource analysis that was included as Appendix D in its state Final EIS (Trinity, 2022). Trinity (2022) estimated the yearly average and total magnitude of emissions from on-site sources for the full period of construction. Emission factors for construction and operation were sourced from AP-42 (USEPA 1995), CFR 40.98, or manufacturer supplied information (Trinity, 2022). Average emissions from combustion each year during construction is estimated to be 1.56-ton SO_2, 176.72-ton CO, 216.92-ton NOx, 8.83-ton PM_{10}, 8.83-ton $PM_{2.5}$, and 11.81-ton VOCs. The total emissions during construction are estimated to be 1.56-ton SO_2, 176.72-ton CO, 216.92-ton NOx, 1,086.20-ton PM_{10}, 118.17-ton $PM_{2.5}$, and 11.81-ton VOCs (table 3.3.11-3).

Land disturbing activities make up the largest part of the average yearly estimated fugitive dust emissions: 1,075.59-ton PM_{10}, 107.59-ton $PM_{2.5}$. Applying dust palliatives to limit air borne particles as proposed by FFP in it soil erosion plan would minimize fugitive dust emissions.

The General Conformity Rule is codified in 40 CFR 93, Subpart B and was developed to ensure that federal actions in nonattainment and maintenance areas do not impede states' attainment of the National Ambient Air Quality Standards (NAAQS). A conformity determination must be conducted by the lead federal agency if a federal action's construction and operation activities are likely to result in generating direct and indirect emissions that would exceed the conformity applicability threshold level of the pollutant(s) for which a county is designated as nonattainment or maintenance. Because the project is not located in nonattainment or maintenance area, the conformity rule does not apply. However, emissions during project construction would exceed EPA's General Conformity de minimums thresholds: NOx (100 tons/yr), CO (100 tons/yr), PM_{10} and $PM_{2.5}$ (70-100 tons/yr).

While EPA's Prevention of Significant Deterioration program and Title V requirements do not apply to temporary construction activities, Trinity (2022) compared criteria pollutant emission rates for the construction phase of the proposed project to federal thresholds for the PSD and Title V program as a comparison of the relative magnitude of effects. The results of the construction phase emissions analysis show that criteria pollutant average annual emission rates would be well below the significance thresholds for the PSD/Title V programs. Therefore, construction phase criteria pollutant impacts would not result in significant air quality impacts.

During operation, emissions-generating sources would be limited to emergency generator operation, portable generator operation, and vehicle traffic. As a result, the main pollutants emitted from the operations phase of the project would be carbon monoxide, oxides of nitrogen,

and $PM_{10}/PM_{2.5}$. Estimated emissions do not exceed EPA's General Conformity de minimums thresholds.

Greenhouse Gases

Emissions of GHGs are quantified in units of carbon dioxide equivalents (CO_2e). The CO_2e unit of measure considers the global warming potential (GWP) of each GHG over a specified timeframe. The GWP is a ratio relative to CO_2 that is based on the GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. Thus, CO_2 has a GWP of 1, CH_4 has a GWP of 25, and N_2O has a GWP of 298 on a 100-year timescale. To quantify the CO_2e, the mass of the compound is multiplied by the corresponding GWP, the product of which is the CO_2e for that compound. The CO_2e value for each of the GHG compounds is summed to obtain the total CO_2e GHG emissions.

The project construction phase would produce GHG emissions from fuel combustion and would result in approximately 87,919 metric tons of CO_2e over the five-year construction period, or approximately 17,584 metric tons of CO_2e annually.

Once the project is put into operation, the project would consume about 4,347,000 MWh of electricity per year for pumping operations during low electricity demand periods to generate about 3,561,000 MWh of electricity per year during high demand periods. Fossil fueled electricity generation currently accounts for about 21% of Washington's net electricity generation, with about 17.5% coming from natural gas-fired plants and about 3.4% coming from coal-fired facilities.[73] Assuming that the project would use an equivalent proportion of natural gas and coal fired electricity from the grid to pump water to the upper reservoir, it would consume about 760,725 MWh and 147,798 MWh of natural gas and coal-fired generation per year, respectively. Using the emissions rates for these facilities from DOE (2016), this would equate to a total of 526,445 metric tons CO_2 per year.[74]

Generation operations and project maintenance would result in insignificant emissions of GHGs from the occasional combustion of fuels in project trucks and small onsite generators. Additionally, the project would generate a total of 3,561,000 MWh of electricity from hydropower per year, which would displace an equivalent amount of generation from the current mix of generating sources, including natural gas and coal-fired generation at the proportions described above (17.5% natural gas and 3.4% coal-fired generation). Therefore, project generation would displace about 314,953 MWh of natural gas and 115,304 MWh of coal-fired generation per year. Using the same emissions rates for these facilities from DOE (2016) and

[73] U.S. Energy Information Administration - EIA - Independent Statistics and Analysis. Accessed on March 23, 2023.

[74] Estimate assumes an emission rate of 505.4 kg CO_2 per MWh electricity generated at a natural gas facility, which is an average of natural gas combustion turbines (604.2 kg CO_2 per MWh) and combined-cycle turbines (406.6 kg CO_2 per MWh); and 960.6 kg CO_2 per MWh electricity generated at coal-fired facilities.

described above, this would equate to a total of 430,526 metric tons of CO_2 displaced by project generation per year.

Therefore, under these assumptions, the project's combined pumping and generation operations would result in net increase in GHG emissions of 96,189 metric tons of CO_2e per year.

Climate Change

Climate change is the variation in the Earth's climate (including temperature, precipitation, humidity, wind, and other meteorological variables) over time.

Climate change is a global concern; however, the climate change analysis in this EIS focuses on the existing and potential climate change impacts specific to the project's location in Washington. The U.S. Global Change Research Program Climate Science Special Report (U.S. GCRP, 2017) divides the U.S. into ten distinct regions; the state of Washington is in the Pacific Northwest Region. The report notes the following trends in climate for the Pacific Northwest Region: (1) annual average temperatures across the Northwest increased by 1.54°F from 1901 through 2016, and (2) the date of seasonal maximum snow depth has occurred approximately one week earlier since the 1960s. The report also projects the following climate change impacts in the Pacific Northwest Region: (1) temperatures are projected to increase by 4.67 °F by 2065 compared to levels from 1976-2005 under a global emissions scenario of continually increasing emissions, and would increase by 3.66 °F under a lower (decreasing emissions) scenario; (2) by mid-century, both extreme cold waves and extreme heat waves are projected to increase substantially with changes in the coldest day of the year increasing by 7.33 °F and changes in the warmest day of the year increasing by 6.25 °F. The U.S. GCRP report does not provide projections for changes in precipitation that are directly applicable to Washington; however, NOAA (2022) makes the following projections: (1) warming temperatures will increase the elevation at which snow falls, which will increase the likelihood that precipitation will fall as rain instead of snow, reducing water storage in the snowpack; (2) higher spring temperatures will cause an earlier melting of the snowpack, further decreasing water resources during the already dry summer months; (3) winter and spring precipitation is projected to increase, while decreases in summer precipitation are possible; and (4) droughts will be more intense because higher temperatures will increase the rate of soil moisture loss during dry spells.

As previously discussed, project construction would result in total GHG emissions of about 87,919 metric tons of CO_2e over the duration of construction, while project operation could potentially increase GHG emissions by about 96,189 metric tons CO_2e per year. To assess the climate change impacts from the project, we considered whether we could identify discrete physical impacts resulting from the project's GHG emissions or compare the project's GHG emissions to targets established to combat climate change. To date, we have not identified a methodology to attribute discrete, quantifiable, physical effects on the environment resulting from the project's incremental contribution to GHGs. Without the ability to determine discrete resource impacts, we are unable to assess the project's contribution to climate change through any objective analysis of effects attributable to the project. Additionally, we are not aware of any established threshold for determining the project's significance when compared to established GHG reduction targets at the state or federal level. We therefore do not characterize

the project's GHG emissions as significant or insignificant. However, as Commission staff has done in other NEPA analyses, we disclose the project's GHG emissions in comparison to national and state GHG emission inventories.

At a national level, 5,222.4 million metric tons of CO_2e were emitted in 2020 (inclusive of CO_2e sources and sinks) (EPA, 2021b). Therefore, construction emissions from the project could potentially increase CO_2e emissions based on the national 2020 levels by about 0.00034% per year for 5 years during the construction period. To provide context of the project emissions on the state level, we compare the project's GHG emissions to Washington GHG inventories. Washington's GHG emissions in 2020 were 81.09 million metric tons CO_2e (inclusive of CO_2e sources and sinks) (EPA, 2023). Therefore, construction emissions would increase CO_2e emissions based on Washington 2020 levels by about 0.02% per year for 5 years.

Once the project is put into operation, it could potentially increase CO_2 emissions based on the national 2020 levels by about 0.0018% per year. Based on the State of Washington's 2020 levels, project operation could potentially increase CO_2 emissions by about 0.12% per year.

However, while our analysis shows that project operation could potentially cause a net increase in GHG emissions, the overarching purpose of the project is to promote renewable energy development by using excess renewable energy from wind power generated in the region to pump and store water for later hydroelectric generation when there is less grid power available. Therefore, it is possible that the project's pumping operations would predominately rely on excess wind power that is otherwise underutilized under current conditions because the power is not needed at the time that it is available or there is insufficient storage for the excess power. If the project were to predominately use excess wind power for pumping operations, then project operation might not appreciably increase GHG emissions and instead could reduce GHG emissions compared to current conditions. Regardless, because the intent of the project is to promote renewable energy development by utilizing excess wind energy and storing that energy for later use when the power is needed, the project would be consistent with state and national goals for reducing GHG emissions.

3.3.12 Noise

3.3.12.1 Affected Environment

The project area is sparsely populated. The land surrounding the upper reservoir is primarily used for grazing and farming and is developed with wind turbines. Scattered residences are located approximately 1 mile to the northwest on Oak Hill Road, and approximately 2 miles to the north on Hoctor Road. Roads that would likely be used most during construction include Hoctor Road and U.S. Route 97.

The lower reservoir would be constructed in an area that has historically been developed for industrial purposes, including the CGS smelter and John Day Dam. Sensitive noise receptors in the vicinity of the lower reservoir include residences and public parks. The closest residential receptor is located off Washington State Route 14 approximately 0.3 miles to the west, and additional residences are located further west on Highway 14, and in Rufus, Oregon, a town approximately 1.5 miles to the southwest, across the Columbia River. Public parks in the

vicinity of the lower reservoir include Railroad Island Park, on the north shore of the Columbia River approximately 0.7 miles to the east, and Giles French Park, on the south shore of the river approximately 1.2 miles to the south.

The transmission line from the project switch yard to the John Day Substation would be located approximately 0.75 miles south of residential receptors in Rufus.

Existing ambient noise levels are expected to vary depending on the time of day and year. For example, ambient noise levels around the upper reservoir are expected to be the greatest when farming activity or wind turbine maintenance requires the use of heavy machinery. The estimated existing daytime and nighttime outdoor sound levels (Leq)[75] at the receptors in the vicinity of the upper and lower reservoirs, shown in table 3.3.11-1 and based on EPA information (EPA, 1974), are 40 and 30 dBA, respectively.

3.3.12.2 Environmental Effects

Noise is generally defined as unwanted sound with intensity greater than the ambient or background sound pressure level. Project construction activities would affect overall sound levels in the project vicinity. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetation cover.

Sound from a localized source (i.e., point source) propagates uniformly outward from the source in a spherical pattern. The sound level attenuates due to the following factors (Caltrans, 2013): distance between source and receptor, atmospheric effects and refraction, ground absorption, and terrain (shielding by natural and human-made features, noise barriers, diffraction, and reflection). Generally, sound levels attenuate at a rate of 6 dB for each doubling of distance from a point source (FHWA, 2011).

Project construction would occur over a 5-year period, with the loudest construction activities occurring during the first three years associated with land clearing, excavation, and construction of the upper and lower reservoirs. Noise would be generated by the concrete batch plants, haul trucks, concrete pumpers, a crane, loaders, dump trucks, and other equipment. Periodic blasting would also likely be required during the installation of the project penstocks and tunnels.

Because of the rural setting, FFP does not propose any specific measures to mitigate noise levels.

No entity has recommended any measures to minimize noise during project construction.

[75] Equivalent sound level (Leq): an average of the sound energy occurring over a specified period.

Our Analysis

Elevated construction noise from equipment and traffic would be generated for the duration of construction but would return to current levels upon project completion.

Noise levels in the Klickitat County, Washington are regulated by Klickitat County Code of Ordinances, Chapter 9.15 - Public Disturbance Noises. Construction noise emanating from temporary construction sites is exempt or partially exempt from the provisions of the ordinance between the hours of 7:00 a.m. and 10:00 p.m.

Noise levels in the Sherman County, Oregon portion of the area of analysis (transmission line) are regulated by Oregon Administrative Rule 340-035-0035, Noise Control Regulations for Industry and Commerce. Oregon Administrative Rule 340-035-0035(5)(g) specifically exempts construction activity.

Table 3.3.11-4 shows the total composite noise levels at the closest receptors, based on typical equipment operating during each phase of construction and the typical usage factor for each piece of equipment. The calculated levels are likely conservative, because the only attenuating mechanism considered was geometric spreading, which results in an attenuation rate of 6 dBA per doubling of distance; attenuation related to the presence of structures, trees or vegetation, ground effects, and terrain is not considered. FFP estimates that the loudest construction activities including blasting and vibratory drilling or hammering will be around 95 dBA 50 feet from the source.

Temporary, peak construction noise levels during of the upper reservoir were calculated to be 42.0 dBA at the closest known receptors – the residences along Oak Hill Road. The worst-case noise levels for the lower reservoir during peak construction activity were calculated to be 55.3 dBA at the closest known receptors – the residences along Route 14. Noise levels at the closest public park – Railroad Island Park – would reach approximately 46.1 dBA during the worst-case construction period. Sound levels between 42 dBA and 55.3 dBA would be comparable to noise levels from normal conversation and while noticeable, should not be significantly louder than ambient conditions. Because the project will be constructed in rural areas that are located away from noise-sensitive uses and regularly include machinery noise from trucking, wind farm operations, and agricultural practices, it is unlikely that there will be a perceived change in overall noise levels. Further, as proposed in the draft Wildlife Management Plan, construction would be limited to the hours of 8 am to 6 pm to protect crepuscular wildlife in the project area. This in turn would minimize effects on nearby residences by confining the construction activities to the daytime.

If tribal members can access *Pushpum*, they would likely be much closer to the construction site and construction noise would be much greater and likely disruptive to their normal tribal practices.

Once the project is operating, noise levels are expected to be negligible. Noise generated from the turbine-generator system will be the greatest source of operational noise. The loudest noise levels will be associated with the powerhouse which will be underground. Given the

attenuation rates and that the powerhouse is located underground, noise levels will not contribute to elevated ambient noise beyond 500 feet of the substation.

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Goldendale Project would not be constructed. There would be no changes to the physical, biological, or cultural resources of the area and electrical generation from the project would not occur.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the Goldendale Project's use of environmental resources for hydropower purposes to see what effect various proposed or recommended environmental measures would have on the cost to operate and maintain the project and on the project's power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp*.,[76] the Commission compares the current cost to produce project power to an estimate of the cost to provide the same amount of energy and capacity for the region using the most likely alternative source of power (cost of alternative power). In keeping with the policy described in *Mead Corp*., our economic analysis is based on current electric power cost conditions and does not anticipate or estimate changes in fuel costs that could occur during the project's license term.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the annualized cost of providing the individual measures considered in the EIS; (2) the cost of most likely alternative source of project power; (3) the total annual project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of the current alternative source of project power and the total annual project cost. Power and developmental costs for the project can be found in table E-1 in Appendix E. A comparison of alternatives can be found in table E-2 in Appendix E.

If the difference between the cost to produce an equivalent amount of power from an alternative source and the total annual project cost is positive, the project produces power at a cost less than the cost of producing from the most likely least-cost source of alternative power. If the difference between the alternative source of power's annual cost and the total annual project cost is negative, the project costs more to produce an equivalent amount of power from the most likely least-cost source of alternative power. This estimate helps 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.

Although pumped storage projects are net energy consumers because they require more energy to pump the water up to the upper reservoir than they produce when generating, pumped storage projects have the benefit of being able to store the energy produced by other generating facilities during low-demand periods by pumping water into the upper reservoir during those periods and then using that water for generation during higher-demand periods. Moreover, unlike nuclear and fossil-fueled base-load units that are typically brought online and remain operational through the course of the day because it is inefficient to bring them online and offline due to the lengthy start-up time required, pumped storage projects can be offline and then be brought online quickly to meet high energy demands.

There are several wind and solar generation facilities planned or proposed throughout Washington and Oregon that could be integrated with local energy infrastructure to provide

[76] See *Mead Corp.*, 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.

power to pump water to the upper reservoir during low demand periods including weekends. The variability of the output of these facilities can be problematic to the electric grid because they can create system imbalances by themselves. Such facilities typically work best when they are located close to generating facilities that can provide system balancing capabilities, such as those provided by pumped storage facilities and gas-fired combustion turbines installed specifically to work in concert with solar and wind farms to provide system stability.

Pumped storage facilities are designed to be able to change modes rapidly and can fill gaps due to wind and solar power variability. The ability of pumped storage facilities to quickly switch between pumping and generating, as needed, provides unique benefits to the electric grid. Pumped storage facilities can provide several ancillary services to the grid. Among these services are spinning reserve,[77] non-spinning reserve, grid frequency regulation,[78] voltage support and regulation,[79] load following capability, peak shaving, and black-start capability.[80] Pumped storage facilities can operate as base load, load following, or peaking power facilities and change operating modes seasonally and daily. Most hydroelectric facilities can start within minutes, if not seconds, depending upon available water supply. When in load following mode, the output of the pumped storage facility can be adjusted as necessary to meet widely varying load requirements.

The power and economic benefits of the proposed Goldendale Project, the comparison of each alternative for the project, and the cost of environmental enhancement measures considered in our analysis are presented in appendices E and F.

[77] Spinning reserve is the extra generating capacity that is available by increasing the power output of generators that are already connected to the power system. Non-spinning reserve or supplemental reserve is the extra generating capacity that is not currently connected to the system but can be brought online after a short delay.

[78] Grid frequency is a system-wide indicator of overall power imbalance. These imbalances are removed by requesting generators to operate in frequency control mode, altering their output continuously to keep the frequency near the required value.

[79] System voltage levels vary over the course of a day due to a variety of factors, including: (1) the location of the local distribution line, (2) proximity to large electricity consumers, (3) proximity to utility voltage regulating equipment, (4) seasonal variations in overall system voltage levels, and (5) load factor on local transmission and distribution systems.

[80] Black-start is the procedure to recover from a total or partial shutdown of the transmission system, which has caused an extensive loss of supplies. This entails starting isolated power stations individually and gradually reconnecting them with each other to form an interconnected system again.

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 of, 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 would 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 Goldendale Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review of agency and public comments filed on this project and our review of the environmental and economic effects of the proposed project and its alternatives, we selected the staff alternative, as the preferred option. We recommend this option because: (1) issuance of an original hydropower license by the Commission would allow FFP to construct and operate the project as an economically beneficial and dependable source of electrical energy for its customers; (2) the public benefits of this alternative would exceed those of the no-action alternative; and (3) the recommended measures would protect fish and wildlife resources. Many of the existing cultural resources could not be protected; however, data recovery would partially mitigate these losses.

In the following section, we make recommendations as to which environmental measures proposed by FFP or recommended by agencies and other entities should be included in any license issued for the project. In addition to FFP's proposed environmental measures, we recommend additional staff-recommended environmental measures to be included in any license issued for the project. We also discuss which measures we do not recommend including in the license.

5.1.1 Measures Proposed by FFP

Based on our environmental analysis of FFP's proposal discussed in section 4 and the costs discussed in section 5, we recommend including the following environmental measures proposed by FFP in any license issued for the project.

Geology and Soils

- Develop a soil erosion control plan that BMPs for controlling wind and water erosion on project land.

- Develop a vibration monitoring plan to monitor for the effects of drilling the tunnels and powerhouse cavern during project construction on the foundations and underground utilities of nearby wind turbines.[81]

- Implement a West Surface Impoundment Plan filed on November 20, 2020, that includes methods and procedures for excavating and disposing of contaminated soils and liner materials during construction of the lower reservoir.

Water Resources

- Implement a Monitoring Well Plan filed on November 20, 2020, that includes decommissioning 15 existing groundwater monitoring wells that would be displaced to construct the lower reservoir and install new groundwater monitoring wells at locations selected in collaboration with Washington DOE.

- Implement a Spill Prevention, Control, and Countermeasure Plan filed on May 24, 2022, that includes protocols for handling and containing hazardous materials during project construction, operation, and maintenance.

- Implement a Dewatering Plan filed on May 24, 2022, that includes procedures for sampling and managing groundwater encountered while constructing the tunnels, powerhouse cavern, and lower reservoir.

- Implement a Stormwater Pollution and Prevention Plan filed on May 24, 2022, that includes BMPs for managing stormwater to prevent contamination of surface waters from construction, operation, and maintenance activities.

- Implement a Reservoir Water Quality Monitoring Plan filed on May 24, 2022, that include procedures for annually monitoring and reporting on water quality in the project reservoirs (i.e., dissolved solids, nutrients, and heavy metals) during project operation to determine the need for protection measures.

Terrestrial Resources

- Implement a Vegetation Management Plan filed on June 23, 2020, that includes noxious weed management, surveys and protection of special status plants, and revegetation of disturbed areas with a native upland seed mix and monitoring for 5 years or until fully established.

- Implement a Wetland Mitigation Plan filed on May 24, 2022, that includes: (1) evaluating the viability of establishing and rehabilitating a new stream course on-site at a minimum 1:1.1 ratio to mitigate for permanent impacts to the stream labeled S1, S7, and S8; (2) using BMPs to control erosion; (3) revegetating disturbed areas with a native seed mix; (4) using

[81] FFP would include in the plan a provision to conduct a construction baseline survey and include contractor requirements and vibration criteria to be followed to minimize effects on existing wind farm facilities.

appropriate construction management to minimize the spread of invasive weeds; and (5) monitoring revegetated areas for a minimum of 10 years until specified performance standards are achieved.

- Implement a Wildlife Management Plan filed on June 23, 2020 that includes: (1) 2-years of pre-construction surveys to document bald eagle, golden eagle, and prairie falcon nesting and bald eagle roosting sites and to develop appropriate spatial and temporal restrictions on construction activities; (2) a training program to inform employees of sensitive biological resources; (3) procedures to limit the construction zone to avoid sensitive areas; (4) a construction monitor; (5) limiting construction activities to the hours of 8:00 a.m. to 6:00 p.m. to avoid disrupting crepuscular and nocturnal wildlife; and (6) project vehicle speed limits onsite to reduce wildlife collisions.

- To mitigate for the permanent loss of wildlife habitat, work with FWS and Washington DFW to select and purchase 277 acres[82] of off-site land and manage the land for golden eagle nesting and foraging habitat.

- To deter wildlife from using the project reservoirs, implement the following measures filed as part of its Wildlife Management Plan, to: (1) install a chain link fence that is at least 8 feet high around the reservoirs; (2) mark all fences with vinyl strips and/or reflective tape to reduce avian collision risks; (3) prevent the establishment of vegetation around the reservoirs; (4) cover the reservoir surfaces with floating plastic shade balls to reduce the open-water habitat that could attract waterfowl, water birds and other raptor prey species; (5) monitor for and remove carcasses of livestock and other animals from the project area that may attract scavenging wildlife, foraging eagles, or other raptors; (6) develop a monitoring program to identify bird and mammal usage of the reservoirs and measure the effectiveness of wildlife deterrents in using the reservoirs; and (7) develop a reporting system to document wildlife mortalities, injuries, nuisance activity, and other interactions.

- To minimize avian electrocution and collision hazards with the project transmission line, construct the transmission line on existing poles and ensure there is 40 inches or more of vertical clearance and 60 inches or more of horizontal clearance between energized conductors or energized conductors and grounded hardware.

Recreation and Land Use

- Develop a fencing and/or public safety plan for restricting public access to hazardous areas and to protect recreationalists during construction and operation.

- Develop a visual and recreation resources management plan that includes installing an interpretive sign at a location that provides views of the project and is accessible to persons with disabilities. The signage would include a map of the project and information on pumped storage. The plan would also include a provision to coordinate construction

[82] Acreage is based on a ratio of 2:1 acre for permanent loss of habitat for the upper reservoir (92.36 acres) and a ratio of 1:1 for the loss of habitat for the lower reservoir (91.8 acres) because of its poorer habitat quality.

schedules and any associated road closures or delays with Washington DOT and Klickitat County to prevent interruption to recreational traffic.

Cultural Resources

- Implement a Historic Properties Management Plan (HPMP) to mitigate unavoidable adverse impacts to historic properties.

Aesthetic Resources

- Include in the visual and recreation resources management plan provisions to (1) use "engineering controls" during the design process, where practicable, and select natural paint colors and dulling reflective surfaces that cannot be painted to reduce the contrasts of the project structures with the landscape; (2) minimize footprints aboveground features to the furthest extent reasonably practicable; (3) ensure facilities are free of debris and store unused or damaged equipment offsite so it is not visible; (4) plant native vegetation and/or trees to break up the lines of roads and facilities and soften the visual effect on the landscape; and (5) install fully shielded, low pressure sodium lighting or LED lighting to protect the night sky from light pollution and use operational devices that allow surface night-lighting in the central project area to be turned on only as needed for safety.

Traffic Management

- Develop a traffic management plan with provisions for traffic control measures (e.g., signage, flaggers at key intersections, reduced speed limits or other speed control devices, controlled or limited access routes) and protocols for coordinating construction schedules, any temporary road or lane closures, and any traffic control measures identified in consultation with Washington DOT and Klickitat County to minimize disruption of traffic on public roads during project construction.

5.1.2 Additional Measures Recommended by Staff

Under the staff alternative, the project would be constructed and operated with FFP's proposed measures identified above, with the following additions and modifications. We discuss the basis for our additional staff-recommended measures and the rationale for modifying FFP's proposal in Appendix G

Terrestrial Resources

- Modify FFP's proposed Vegetation Management Plan to include (1) pre-construction surveys for federal and state listed plants during the spring and early summer to improve the chances of detecting and protecting rare species; (2) shrubs and species of traditional cultural importance if they are available in the revegetation seed mix to offset the loss of culturally important plants and better achieve the revegetation goals; (3) an integrated pest management approach to controlling noxious weeds; and (4) protocols for preventing and controlling wildfires during project construction and operation.

- Modify the proposed Wildlife Management Plan to include (1) surveys for peregrine falcons (in addition to surveying other raptor species already identified in the plan) throughout the 5-year construction period; (2) surveys for Dalles sideband snail, monarch butterfly, and juniper hairstreak butterfly just prior to construction in areas where land disturbing activities would occur; (3) a management plan for the golden eagle mitigation lands; and (4) a detailed wildlife deterrent management plan for the project reservoirs that includes monitoring methods, metrics for evaluating the effectiveness of the deterrents in reducing the attraction of the project reservoirs to birds, bats, and other wildlife, and criteria for deciding whether additional deterrents or modifications to the project are needed.

- Develop an Avian Protection Plan for the project transmission line that includes FFP's proposed protection measures but also includes procedures for monitoring bird fatalities and addressing problem poles.

Recreation Resources

- Include a provision in the visual and recreation resources management plan to coordinate construction schedules and any associated road closures or delays on John Day Dam Road with Corps personnel at John Day Dam, the BIA, and tribal governments through the Columbia Inter Tribal Fish Commission, in addition to Klickitat County and Washington DOT.

Cultural Resources

- Revise the HPMP to include specific treatment measures for all affected archeological sites and TCPs. The treatment should include research design and site-specific data recovery or other treatment plans, including analysis, recordation, and curation, and a specific plan for construction site monitoring, Construction monitoring should include (1) identifying the specifies areas that will be monitored during construction; (2) the location of the National Register-eligible cultural sites to be avoided and how they will be marked and avoided where possible; and (3) protocols for training construction workers on the importance of cultural sites, how to identify cultural sites, the need to avoid damage to cultural sites, and procedures to follow if previously unidentified cultural sites, including Indian graves, are encountered during construction.

In Appendix G, we discuss the reasons for recommending the additions or modifications to FFP's proposal and why we do not adopt certain recommendation proposed by other entities.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Project construction would disturb soils in the project area, resulting in temporary adverse erosional effects on soil resources. FFP's would incorporate BMPs into a soil erosion plan that would minimize erosion and sedimentation. Fugitive dust and vehicle emissions would be emitted during project construction. The project is not in a non-attainment area and the construction emissions would be localized and last for 5 years with the greatest emission occurring years 2 and 3. Implementing BMPs, such as applying dust palliatives to disturbed areas; covering haul trucks transporting soil, sand, or other loose material on the site; minimizing

idling time by either shutting equipment off when not in use or reducing idling time to 5 minutes; establishing protocols for equipment inspection and maintenance programs to ensure work and fuel efficiencies, would minimize emissions and ensure no long-term adverse effects to air quality.

Project construction would result in the temporary disturbance of 54.3 acres of vegetation and the permanent loss of 193.6 acres (table 3.3.4-5). Soil disturbance would facilitate the spread of noxious weeds, displacing native plant species and altering wildlife habitat characteristics. Implementing the measures proposed in the Vegetation Management Plan would quickly revegetate disturbed land and control noxious weeds, mitigating adverse effects of project construction.

Project construction activities would displace wildlife for the 5-year construction period. Developing appropriate spatial and temporal restrictions on construction activities (e.g., avoiding on or near-surface blasting and helicopter use within 0.25 to 1 mile of an active raptor nest, depending on the species), and monitoring any documented nests to ensure construction activities avoid disturbing the nests would minimize disturbance effects to the extent practical.

Constructing the upper and lower reservoirs would also result in the loss of foraging and nesting habitat important to golden eagles and land containing plants that are gathered by and are culturally important to the Yakama, Umatilla, and Nez Perce Tribes. Construction activities could temporarily displace nearby nesting golden eagles. Acquiring and improving habitat on 277 acres that provides nesting and foraging habitat for golden eagles would offset the permanent loss of their foraging habitat. Revegetating disturbed areas with plants that are harvested by the Yakama and other tribes would help offset the loss of the lands occupied by the reservoirs.

The overhead transmission line could result in bird collisions or electrocutions which could cause direct injury or mortality of individual animals. Designing the overhead line consistent with practices outlined by the Avian Power Line Interaction Committee, including marking to increase visibility, would minimize this potential to the greatest extent practicable.

Construction activities would result in increased traffic on area roads, leading to delays and changes in traffic patterns. Coordinating the construction schedule and developing a traffic management plan in coordination with the state and county would minimize traffic delays.

Project construction activities would create temporary visual impacts to motorists and residents in the project area from the presence of construction equipment, land disturbance, and increased dust levels. Constructed project features, even after proposed visual mitigation measures are in place, would be permanently visible to varying degrees. The project features would add to the industrial character of wind farms, abandoned smelter, transmission lines, and John Day Dam in the immediate area of the project. The addition of the reservoirs would adversely affect the views from *Pushpum* and the Yakama tribal members cultural practices.

Project construction would directly adversely affect each of the five individual archaeological resources, the larger Columbia Hills Archaeological District, and the three TCPs (*Pushpum, Nch'ima*, and *T'at'alíyapa*), which are all eligible for listing on the National Register.

Pushpum has great traditional, cultural, and religious importance to the Yakama and Umatilla Tribes. The Yakama and Umatilla have used the area for thousands of years and continued to access the area for plant gathering and ceremonial purposes up to at least 10 or 20 years ago. The physical presence of the proposed project within the TCPs would also have permanent indirect adverse effects on the contributing elements to the TCP. These direct and indirect adverse effects on the TCPs would be irreversible and would cumulatively add to the adverse effects on the TCPs that have already occurred due to construction of the wind farms, the smelter, and John Day Dam. Full data recovery and recordation of those archaeological sites determined eligible for the National Register would partially mitigate the unavoidable adverse effects to the individual sites and the TCPs. Revegetating disturbed lands with plants with cultural value to the Yakama and other tribes and allowing access to those areas on project land where it is safe to do so, would partially mitigate for the adverse effects.

5.3 FISH AND WILDLIFE AGENCY RECOMMENDATIONS

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency would attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

In response to our March 24, 2022 notice of application ready for environmental analysis and soliciting comments, recommendations, terms and conditions, and prescriptions, the following fish and wildlife agencies submitted recommendations for the project: Washington DFW filed 5 section 10(j) recommendations on May 18, 2022; Interior filed 4 section 10(j) recommendations on May 19, 2022, and NMFS filed 4 section 10(j) recommendations on May 23, 2022. Appendix H lists the recommendations filed pursuant to section 10(j) and indicates whether the recommendations are included under the staff alternative, as well as the basis for our preliminary determinations concerning measures that we consider inconsistent with section 10(j). Environmental recommendations that we consider outside the scope of section 10(j) have been considered under section 10(a) of the FPA and are addressed in the specific resource sections of this document.

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 the federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Appendix I lists the comprehensive plans that are applicable to the Goldendale Project. No inconsistencies were found.

6.0 LITERATURE CITED

The literature cited in this EIS is presented in Appendix J.

7.0 LIST OF PREPARERS

The list of preparers of this EIS is presented as Appendix K.