

Office of
Energy
Projects

February 2024

FERC/EIS-0331F

**FINAL 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

Estimate of Staff's time spent preparing the Environmental Impact Statement: \$149,390

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

To the Agency or Individual Addressed:

Reference: Final Environmental Impact Statement

Attached is the final environmental impact statement (final 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 final 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 final EIS will be part of the record from which the Commission will make its decision. The final EIS was sent to the U.S. Environmental Protection Agency and made available to the public on or about February 16, 2024.

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.

The final EIS 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).

Attachment: Final Environmental Impact Statement

COVER SHEET

a. Title:	Environmental Impact Statement for Hydropower License, Goldendale Energy Storage Project – FERC Project No. 14861-002.	
b. Subject:	Final Environmental Impact Statement	
c. Lead Agency:	Federal Energy Regulatory Commission	
d. Abstract:	<p>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, Burlington Northern Santa Fe (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 cleanup by the potentially liable parties (i.e., NSC Smelter, LLC and Lockheed Martin Corporation) as overseen by Washington Department of Ecology.</p> <p>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 seven 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.</p> <p>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.</p> <p>Staff’s recommendation is to license the project as proposed, with certain staff modifications and additional measures recommended by the agencies.</p>	
e. Contact:	<p>Michael Tust Federal Energy Regulatory Commission Office of Energy Projects 888 First Street, N.E. Washington, D.C. 20426 (202) 502-6522</p>	<p>Danielle Elefritz Federal Energy Regulatory Commission Office of General Counsel 888 First Street, N.E. Washington, D.C. 20426 (202) 502-8767</p>
f. Transmittal:	This final environmental impact statement on an application to construct and operate the Goldendale Energy Storage Project is being made available on or about February 16 2024, 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, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, Pub. L. 97-258, §4(b), September 13, 1982, Pub. L. 118-5, June 3, 2023).

FOREWORD

The Federal Energy Regulatory Commission (Commission), pursuant to the Federal Power Act (FPA)² and the U.S. Department of Energy Organization Act³ 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

ABL	asphaltic base layer
Advisory Council	Advisory Council on Historic Preservation
AHPA	Archaeological and Historic Preservation Act
APE	Area of Potential Effect
APLIC	Avian Protection Plan Guidelines
BLM	Bureau of Land Management
BMP	best management practice
BNSF	Burlington Northern Santa Fe
B.P.	Before Present
BPA	Bonneville Power Administration
BIA	Bureau of Indian Affairs
°C	degrees Celsius
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
CGA	Columbia Gorge Aluminum
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
Commission or FERC	Federal Energy Regulatory Commission
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DOE	U.S. Department of Energy
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	environmental justice
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
°F	degrees Fahrenheit
ft ² /s ²	feet squared per second squared
FFP	FFP Project 101, LLC
FPA	Federal Power Act
FR	Federal Register
FWS	U.S. Fish and Wildlife Service

Goldendale Project	Goldendale Energy Storage Project
or project	
GHG	greenhouse gas
GWP	global warming potential
HAC	hydraulic asphalt concrete
HPMP	Historic Properties Management Plan
HVF	high visibility construction fencing
Interior	U.S. Department of the Interior
IPaC	Information for Planning and Consultation Database
km	kilometer
KOP	key observation point
Klickitat PUD	Klickitat Public Utility District
kWH	kilowatt-hour
kV	kilovolt
LCOS	levelized cost of storage
LED	light emitting diode
Leq	equivalent sound level
m/s	meters per second
m ² /s ²	meters squared per second squared
MSL	mean sea level
MPD	Multiple Property District
MW	megawatt
MWh	megawatt-hour
National Register	National Register of Historic Places
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
Nez Perce Treaty	1855 Treaty between the United States of America and the Nez Perce Indians
NGVD 29	National Geodetic Vertical Datum of 1929
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOx	nitrous oxides
NPCC	Northwest Power and Conservation Council
NPDES	National Pollution Discharge Elimination System
NSC Smelter	NSC Smelter, Inc.
NWI	National Wetlands Inventory
OPP	Office of Public Participation
Oregon DFW	Oregon Department of Fish and Wildlife
PA	Programmatic Agreement
PM	particulate matter
RCRA	Resource Conservation and Recovery Act
REA Notice	notice of application ready for environmental analysis and soliciting comments, recommendations, terms and conditions, and prescriptions
RPH	Rare Plant Habitat

RV	recreation vehicle
SD1	Scoping Document 1
SD2	Scoping Document 2
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
Spill Prevention Plan	Spill Prevention, Control, and Countermeasure Plan
SWMU	Solid Waste Management Unit
TID	Turlock Irrigation District
TCP	traditional cultural property
TKE	turbulent kinetic energy
tons/yr	tons per year
Treaty of Walla Walla	1855 Treaty between the United States and the Walla Walla, Cayuses, and Umatilla Tribes and Bands of Indians in Washington and Oregon Territories
Treaty with the Tribes and Bands of Middle Oregon	1855 Treaty between the United States and the Confederated Tribes and Bands of Indians in Middle Oregon
TWPA	Tuolumne Wind Project Authority
Umatilla Tribes	Confederated Tribes of the Umatilla Indian Reservation
U.S.C.	United States Code
U.S. GCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compound
VRM	Visual Resource Management
WAC	Washington Administrative Code
Warm Springs Tribes	Confederated Tribes of the Warm Springs Reservation of Oregon
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
wildlife deterrent management plan	bird and bat reservoir deterrent management plan
WPNAC	Watershed Professionals Network and Aspect Consulting
WRF	Weather Research and Forecast
WSI	West Surface Impoundment
WQC	Clean Water Act section 401 Water Quality Certification
Yakama Nation	Confederated Tribes and Bands of the Yakama Nation
Yakama Treaty	1855 Treaty between the United States and the Yakama Nation of Indians

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 hydrologically connected to Lake Umatilla, the impoundment formed by the Corps' John Day Dam on the Columbia River.

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. Water 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 360 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) 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 10 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) cleanup process for the smelter being overseen by Washington Department of Ecology (Washington DOE).

Proposed Operation

The project would use surplus renewable 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 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 and sediment 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 Draft Cleanup Action Plan for the WSI that includes methods and procedures for excavating and disposing of contaminated soils and liner materials during construction of the lower reservoir.⁹

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.

⁹ FFP initially proposed to implement a “West Surface Impoundment Plan” with procedures for excavating and disposing of contaminated soils and liner materials during construction and a “Monitoring Well Plan” with procedures for decommissioning groundwater

Aquatic Resources

- Initially fill the project reservoirs between September 1 and March 31 to prevent project-related flow reductions in the Columbia River that could delay salmon smolt migration.
- As part of the proposed Draft Cleanup Action Plan, decommission 10 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 (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 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 includes 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 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.

monitoring wells impacted by construction and installing new wells. FFP filed both plans on November 20, 2020. In its June 6, 2023, comments on the draft EIS, FFP informed Commission staff that it had revised its proposal to implement a single “Draft Cleanup Action Plan” dated November 24, 2021, that it had developed in consultation with Washington DOE. This draft plan combines the previous two plans and contains updated procedures for both disposing contaminated soils and liner materials and decommissioning monitoring wells and installing new wells. FFP did not file a copy of the “Draft Cleanup Action Plan” with the Commission; however, staff accessed a public version of the draft plan online at Washington DOE’s website at <https://apps.ecology.wa.gov/cleanupsearch/document/107675>. Accessed February 2, 2024.

- Implement a Wetland Mitigation and Planting Plan¹⁰ 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 streams labeled 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; (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 on-site to reduce wildlife collisions.
- To mitigate for the permanent loss of wildlife habitat, work with the 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, implement the following measures as part of the proposed Wildlife Management Plan: (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.

¹⁰ 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.

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 Department of Transportation (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.

Aesthetic Resources

- Include in the proposed 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 off-site 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 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 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 the issues and alternatives that 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. On March 31, 2023, we issued a draft environmental impact statement (EIS) for public review and comment and held two public meetings in Goldendale, Washington on May 3, 2023, to discuss the draft EIS and receive comments.

Alternatives Considered

This final 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 with FFP's proposed measures identified above, the conditions required by the Washington DOE Clean Water Act section 401 water quality certification (WQC) included in Appendix M,¹¹ and staff's recommended modifications and additional measures described below.¹²

Geology and Soils

- Ensure that the proposed soil erosion and sediment control plan contains construction measures and BMPs consistent with WQC conditions G.1, G.2, G.3, G.5, G.6, G.7, G.8, G.9, G.10, G.11, and G.16.¹³
- Include the following fugitive dust control measures in the proposed soil erosion and sediment control plan: (1) a surface/roadway watering plan; (2) a monitoring and response plan to identify and address periods of significant dust emission; (3) a provision to identify a

¹¹ The WQC conditions require FFP to file finalized plans for Washington DOE's approval (i.e. Dewatering Plan, Stormwater Pollution and Prevention Plan, Cleanup Action Plan for the West Surface Impoundment, Spill Prevention Plan, Water Quality Monitoring Plan, Wetland Mitigation and Planting Plan). These finalized plans would also need to be filed for Commission approval before construction could begin.

¹² If Klickitat PUD's existing water pump station, infiltration gallery, conveyance pipe, and water supply vault are determined by the Commission to be licensed project works, then FFP could be required to enclose these facilities within the project boundary, file updated project boundary exhibits, and maintain these facilities for the term of any license issued. If a license is issued, a project boundary determination will be made in the license order.

¹³ The WQC conditions require erosion and sediment control measures such as marking all clearing limits, stockpiles, staging areas, and trees to be preserved prior to construction and ensuring stock piles and staging areas are located a minimum of 25 feet from wetlands and surface waters; installing high visibility construction fencing around environmentally sensitive areas (such as wetlands, wetland buffers, riparian buffers, and mitigation areas); using seed mixes consisting of native, annual, and non-invasive plant species; disposing excavated sediment in approved upland disposal sites; re-introducing water into mitigation stream channels gradually at a rate not higher than the normal flow; not using hay or straw on exposed or disturbed soil at mitigation site(s), etc.

threshold high windspeed to stop material movement and processing to prevent significant dust emission events; (4) roadway speed limits to limit dust entrainment; (5) haul truck cleaning and load covering requirements; (6) responsible officials and training procedures; (7) record keeping and reporting schedules; and (8) community/citizen reporting forms/phone-line and contact information to report dust impact events.

Terrestrial Resources

- Modify the proposed Vegetation Management and Monitoring 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 (in consultation with the Tribes) 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) provisions to conduct pre-construction surveys for peregrine falcons and ferruginous hawks (in addition to other raptor species already identified in the plan); (2) provisions to conduct pre-construction surveys for Dalles sideband snail, northwestern pond turtle, monarch butterfly and its preferred milkweed host plants, 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, criteria for deciding whether additional deterrents or modifications to the project are needed, and a schedule for filing monitoring reports with FWS, Washington DFW, Oregon Department of Fish and Wildlife (Oregon DFW), Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), Confederated Tribes of the Umatilla Indian Reservation (Umatilla Tribes), Confederated Tribes of the Warm Springs Reservation of Oregon (Warm Springs Tribes) and Nez Perce Tribe; 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.
- If the monarch butterfly or its host plants are determined to be present based on pre-construction surveys, develop a monarch butterfly management plan that includes measures to protect the butterfly's habitat, such as fencing off occupied areas or including milkweed in its revegetation seed mix.
- 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.

Threatened and Endangered Species

- Limit initial fill and periodic refill of the project reservoirs to between September 1 and March 31 to minimize project-related flow reductions in the Columbia River that could delay salmon smolt migration.

Recreation Resources

- Develop the visual resources and recreation management plan in consultation with the National Park Service and the Tribes and include a provision in the 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 proposed HPMP to include specific treatment measures for all affected archaeological sites and traditional cultural properties (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 specific 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; (3) surveying the archaeological sites using specially trained canines for historic and prehistoric human remains detection to minimize the potential for disturbing any undetected burial sites, and (4) 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.

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 downstream juvenile 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 wildlife habitat and temporary disturbance of 54.3 acres of wildlife habitat; (7) the increased risk of bird and bat mortality from nearby wind turbine interactions caused by their attraction to the project reservoirs; (8) unavoidable adverse effects on five individual archaeological resources, the Columbia Hills Archaeological District, and three TCPs (*Pushpum*, *Nch'ima*, and *T'at'aliyapa*), (9) the potential reduction in access to usual and accustomed plant gathering sites, and (10) changes in the aesthetic character of the landscape, particularly as they relate 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 soil erosion and sediment 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, protecting sensitive areas (e.g., wetlands), 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 Draft Cleanup Action Plan follows accepted practices for removing and disposing of non-hazardous materials and closing and replacing monitoring wells and 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. Sealing and lining the reservoirs as proposed by FFP would prevent seepage into the groundwater that may adversely affect groundwater quality. FFP's proposed Reservoir Water Quality Monitoring Plan as modified by the Washington DOE certification conditions would ensure that a deterioration in water quality in the reservoirs is detected and measures are identified to protect wildlife that may incidentally encounter project waters.

Terrestrial Resources

Vegetation Mitigation

Constructing the project would result in the permanent loss of 193.6 acres of vegetation and disturb 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 Yakama Nation. Implementing FFP's proposed Vegetation Management and Monitoring 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. Staff-recommended monitoring for both state and federal listed plants would allow FFP to take 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 activity would be 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) 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 (3) acquiring and managing 177 acres of lands to mitigate the permanent loss of golden eagle nesting and foraging habitat. Staff's recommended pre-construction surveys would ensure that steps are taken (e.g., marking plants, relocation, fencing) to minimize effects on Dalles sideband snail, northwestern pond turtle, juniper hairstreak butterfly, and monarch butterfly and its host plants, if present.

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 the: 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 include protocols for preventing 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 and temporary compared to the volume of flow in the river. Nonetheless, to prevent any further reductions in Columbia River flow that could contribute delays in smolt migration and adverse effects to migrating salmon smolts, FFP would initially fill the reservoirs between September 1 and March 31 to avoid the peak juvenile salmonid outmigration period. Because the small amount of water required for annual refill (360 acre-feet) could also be met outside the migration season, staff recommends that annual refilling also not be conducted during the peak salmon smolt migration period.

Because the pool that Klickitat PUD draws water from for its municipal water supply (intake pool) is connected to the Columbia River via at least one unscreened culvert, migrating salmon smolts that enter the pool via the culverts could be subject to predation if they cannot exit the pool. However, if they enter the intake pool, it is unlikely that they would become entrained into the project's reservoirs because they would also 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. Further, avoiding filling the reservoirs during the peak salmonid smolt outmigration period would reduce the likelihood of outmigrating salmonids smolts from becoming entrained within the intake pool due to project-related water withdrawals. Therefore, we conclude that constructing and operating the 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 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 threatened North American wolverine, the proposed threatened northwestern pond turtle, and the candidate monarch butterfly. There are no designated critical habitats for these species at and adjacent to the project.

We conclude that constructing and operating the project would not affect the gray wolf because it is unlikely to occur in or use the habitats surrounding the project and would not affect the cuckoo or North American wolverine because the project site does not include habitat to support these species. It is unknown whether the project site is used by the northwestern pond turtle, monarch butterfly, or includes milkweed that might provide suitable habitat for the butterfly. However, including the pond turtle, monarch butterfly, and milkweed in FFP's pre-construction surveys would allow FFP to take steps to protect these species' habitat if it occurs in the area to be disturbed, such as fencing off occupied areas, relocating affected species, or including milkweed in the revegetation seed mix. Therefore, we conclude that constructing and operating the project is not likely to jeopardize the proposed threatened northwestern pond turtle.

Cultural Resources

Project construction would adversely affect five individual archaeological resources, the Columbia Hills Archaeological District, and three TCPs (*Pushpum*,¹⁴ *Nch'ima*,¹⁵ and *T'at'aliyapa*¹⁶). 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 Yakama Nation, Umatilla Tribes, and Nez Perce Tribe. All project land within the identified TCPs is privately owned and the availability of access to these areas is not known at this time.

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, the John Day Dam, existing transmission lines and substation, and the closed smelter. Such changes to the natural landscape would further alter or degrade Tribal spiritual and teaching practices; the degree to which depends on the Tribes' ability to access lands associated with the TCPs.

The John Day Lock and Dam Historic District is not located within the project Area of Potential Effect (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 right-of-way 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 Nation, Umatilla Tribes, and Nez Perce Tribe. Instead, it includes general measures that would be implemented during operation to manage cultural sites, including procedures for addressing

¹⁴ *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.

¹⁵ *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.

¹⁶ *T'at'aliyapa* 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*.

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 archaeological sites, Commission staff recommend that FFP provide for the recovery, recordation, and curation of the sites to mitigate the loss and to survey the archaeological sites using specially trained canines for historic and prehistoric human remains detection to minimize the potential for disturbing any undetected burial sites. However, the Yakama Nation and the Umatilla Tribes 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 intends to execute a Programmatic Agreement (PA) with the Washington State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation 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, surveying for Tribal graves sites using trained canines, 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 an additional 54.3 acres of land, some of which support plants that are gathered by the Yakama Nation, Umatilla, and Nez Perce Tribal members for medicinal 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'aliyapa* 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 project lands for traditional gathering and other purposes has been through the permission of landowners because all the project land and adjoining property 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 presumably would continue to need permission from the adjoining landowners to access the land.

Aesthetic Resources

Project construction and operation would result in both temporary and permanent changes to the viewshed. Temporary changes would occur during the five 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 proposes several measures to reduce the visual contrast of the project facilities with the surrounding landscape which include 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. Staff's recommendation to have FFP consult with resources agencies and the Tribes to develop the proposed visual and recreational resources management plan would allow agencies and Tribes to share their expertise and ensure that the proposed interpretative display is built to appropriate standards and that visual resource impacts on the Lewis and Clark National Historic Trail and Auto-Tour Route are minimized.

The exception are views from the TCPs, particularly *Pushpum*. *Pushpum* has significant meaning and spiritual purposes for the Yakama Nation 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 (nearby 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 \$553,761,921. Under the staff alternative, the project's cost to produce power and capacity would be \$93,271,779 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.

FINAL 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). 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 (Figure 1.1-1).¹⁷ 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 (NSC Smelter) (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 the Burlington Northern Santa Fe (BNSF) Railway Company, 92.3 acres owned by other private entities, and 14.3 acres of the Columbia River.¹⁸ Portions of the project's proposed infrastructure would be located on the site of the former Columbia Gorge Aluminum (CGA) smelter, a Resource Conservation and Recovery Act (RCRA) contaminated site that is the subject of ongoing investigation and cleanup by the potentially liable parties (i.e., NSC Smelter 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 Unit (SWMU) number 4 also known as the West

¹⁷ All remaining figures and tables cited in the main text of this EIS are provided in appendices A and B.

¹⁸ Most of the lands not owned by NSC Smelter that would be enclosed within the project boundary are within an existing transmission right-of-way administered by BPA.

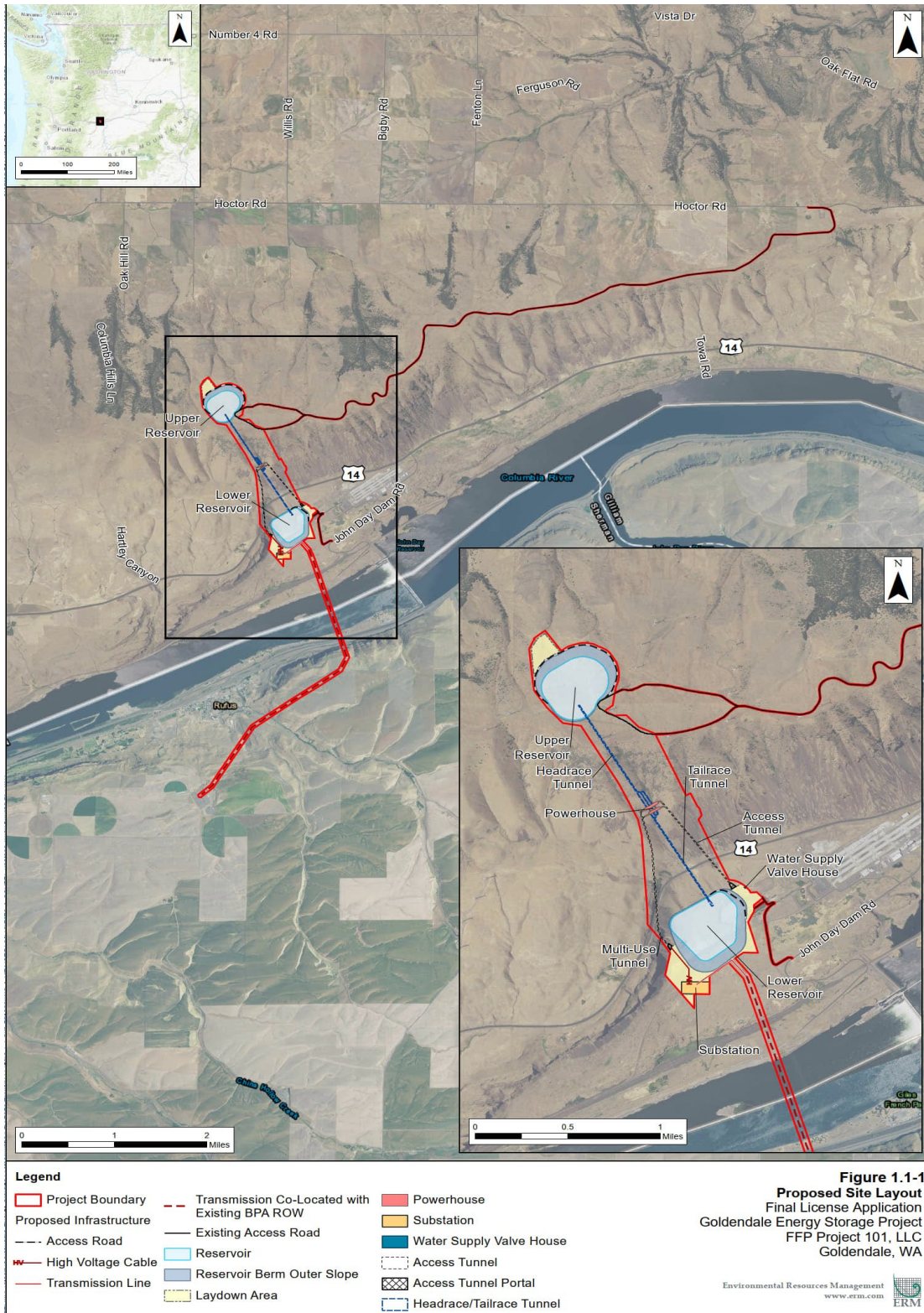


Figure 1.1-1. Location of Goldendale Energy Storage Hydroelectric Project (Source: FFP, 2020, as modified by staff).

Surface Impoundment (WSI).¹⁹ 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 final EIS has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969,²⁰ the Council on Environmental Quality (CEQ) regulations for implementing NEPA,²¹ and the Commission's implementing regulations,²² 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 final EIS, we assess the environmental and economic effects of constructing, operating, and maintaining the project (1) as proposed by FFP (proposed action), (2) the

¹⁹ 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.

²⁰ National Environmental Policy Act of 1969 amended (Pub. L. 91-190. 42 U.S.C. §§ 4321–4347, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, Pub. L. 97-258, §4(b), September 13, 1982, Pub. L. 118-5, June 3, 2023).

²¹ 40 C.F.R. Parts 1500-1508

²² 18 C.F.R. Part 380.

proposed action with additional or modified measures and mandatory conditions (staff alternative), and (3) the no-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, aesthetics, and cultural resources.

1.2.2 Need for Power

The project would provide hydroelectric generation to meet part of the State 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 elevation reservoir during low demand periods and generate power for up to 12 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 percent (%) 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.²³

²³ 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

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

1.3 STATUTORY AND REGULATORY REQUIREMENTS

A license for the project would be subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described in Appendix C.

1.4 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.

1.4.1 Scoping

Before preparing this EIS, staff conducted scoping to determine what issues and alternatives should be addressed. On October 29, 2020, staff distributed a scoping document (SD1) to interested agencies and others and issued a Notice Soliciting Scoping Comments. The notice was published in the Federal Register (FR) on November 4, 2020 (80 FR 70135).²⁴ The following entities provided written scoping 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.

On March 30, 2021, staff issued a revised scoping document (SD2), addressing these comments.

1.4.2 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

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/>.

²⁴ 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.

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

1.4.3 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 in response to the REA Notice: 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 on July 7, 2022.

FFP filed reply comments on July 7, 2022.

1.4.4 Comments on the Draft Environmental Impact Statement

On March 31, 2023, Commission staff issued a draft EIS. Comments on the draft EIS were due by June 6, 2023. In addition, Commission staff conducted two public meetings in Goldendale, Washington on May 3, 2023. Statements made at the meetings were recorded by a court reporter and incorporated into the Commission's public record for the proceeding.²⁵ Appendix L lists those who filed written comments, summarizes all substantive comments that were received on the draft EIS, includes staff responses to those comments, and indicates where Commission staff made modifications to the final EIS.

1.5 TRIBAL CONSULTATION

On February 28, 2019, the Yakama Nation filed comments on FFP's Pre-Application Document.

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. The purpose of this letter was to discuss the licensing process, understand their interests and concerns, and establish procedures to

²⁵ See transcripts of the May 3, 2023, draft EIS meetings filed on June 1, 2023.

ensure appropriate consultation. The letter offered to meet individually with each Tribe or to meet as a larger group. 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 May 1, 2019, Rye Development, on behalf of FFP, held two public meetings to discuss the proposed project. The Yakama Nation, Umatilla Tribes, and Warm Springs Tribes were invited to attend the public meetings. The meetings were attended by Commission staff, resource agencies, and one member of the Yakama Nation. On March 11, 2020, the Yakama Nation filed comments on FFP's draft license application.

On September 22, 2020, Commission staff sent a letter to the Nez Perce Tribe 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, and issued a summary of the meeting on October 7, 2020. On October 16, 2020, the Nez Perce Tribe filed a letter requesting that FFP conduct an ethnographic study of the Nez Perce Tribe's traditional and current uses within the project's Area of Potential Effect (APE). On October 29, 2020, Commission staff directed FFP to conduct the ethnographic study and to file the results with the Commission.

In response to Commission staff's October 29, 2020, SD1 and Notice Soliciting Scoping Comments, the Yakama Nation and the Umatilla Tribes filed scoping comments on December 28 and 29, 2020, respectively. On March 30, 2021, Commission staff issued 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.²⁶ On September 23, 2021, Commission staff responded explaining that while the Commission may delegate aspects of section 106 consultation, it remains ultimately responsible for all findings, evaluations, and determinations. In the letter, Commission staff invited the Yakama Nation to meet with Commission staff to discuss the Tribe's concerns and participation in the licensing process. Commission staff met with the representatives of the Yakama Nation on November 10, 2021. On November 19, 2021, Commission staff filed a summary of the meeting and sent a follow-up letter to the Yakama Nation 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.

²⁶ Section 106 of the NHPA and its implementing regulations found at 36 C.F.R. 800.2(c)(4) allow the Commission to authorize an applicant for a license to initiate consultation with the State Historic Preservation Office (SHPO), Tribes, and others but the Commission remains ultimately responsible for all findings, determinations, and government-to-government consultation.

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.

On March 31, 2023, Commission staff issued a draft EIS indicating that the project would have unavoidable adverse impacts to resources important to Tribes and recommending that FFP modify its proposed Historic Properties Management Plan (HPMP) to provide site-specific mitigation. On the same day, staff issued a draft Programmatic Agreement (PA) for comment that would require the development of the HPMP and invited participation by the Advisory Council on Historic Preservation (Advisory Council) and the Tribes. On May 1, 2023, the Yakama Nation filed comments on the draft PA objecting to the PA, again stating that the Commission had not fulfilled its obligation to consult with the Yakama Nation on a government-to-government basis, and that the Commission has not adequately considered the Yakama Nation's concerns. On May 25, 2023, Commission staff replied acknowledging its trust responsibilities and seeking more information on the types of information the Tribe wanted to share to inform a discussion of the options that may be available for a meeting on substantive matters given the limitations of the Commission's ex parte rules. While the Tribe did not directly respond to the Commission's letter, on June 7, 2023, the Tribe filed comments on the draft EIS. In these comments, the Tribe reiterate its objections to the Commission's delegation of informal consultation to FFP and its opinion that the Commission had failed to consult with the Tribe on a government-to-government basis. The Yakama Nation again invited the Commission to consult "provided that the FERC does not require practices that are inconsistent with Yakama Nation's laws to protect the confidentiality of its traditional cultural properties (TCPs) or the Yakama Nation's prescription for federal-Tribal consultation between federal officials and the elected members of the Yakama Nation Tribal Council."

On June 16, 2023, the Umatilla Tribes filed comments on the draft EIS. The Umatilla Tribes also assert that the Commission failed to consult and adequately consider the importance of the cultural resources to the Tribe.

On October 18, 2023, Commission staff issued a letter offering to meet with both the Umatilla and Yakama Tribes subject to certain practices that would preserve the confidential nature of the information provided by the Tribes while also providing for transparency in any

shared information that might influence the licensing decision. After the Umatilla Tribes expressed a desire to meet, Commission staff issued a notice of the meeting on November 29, 2023, and met with the representatives of the Umatilla Tribes on December 13, 2023. A summary of the meeting was issued on January 19, 2024. On November 3, 2023, the Yakama Nation replied that they are opposed to any meeting that requires public notice and potential attendance by the parties to the proceeding. The Umatilla Tribes filed additional comments on the draft EIS, draft HPMP, and PA on January 24, 2024, which are considered in this final EIS.

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 an existing intake pool which is adjacent to the Columbia River approximately two miles south and east of the proposed lower reservoir site. The intake pool is a backwater slough formed because of a 500-foot-long rock and gravel-filled berm constructed to support the BNSF railroad. Water from the Columbia River enters the intake pool via seepage through the railroad berm materials but can also enter via at least one existing 120-foot-long, 42-inch-diameter culvert running through the berm. 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. The intake pool as well as Klickitat PUD's pump station, water conveyance line, and water supply vault are not proposed by FFP 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 Hactor 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 and the relocation of up to six wooden H-frame towers and up to 10 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;²⁷ (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.

²⁷ 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.

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 (529.6 acres) while also enclosing 23.6 acres owned by 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.²⁸

The proposed project boundary would not include the existing intake pool, Klickitat PUD's existing pump station, or Klickitat PUD's 2-mile-long industrial water conveyance line and water supply vault that currently servicing the smelter cleanup site and another agricultural customer. 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 combined dead storage for both reservoirs (340 acre-feet), and the volume contained within the conveyance system (200 acre-feet). The water purchased for the Goldendale Project would not require Klickitat PUD to obtain new appropriations of water from the Columbia River as they would be purchased under Klickitat PUD's existing water right which would currently permit FFP to draw no more than 4,137 acre-feet²⁹ of water in any calendar year at an average delivery

²⁸ Most of the lands not owned by NSC Smelter that would be enclosed within the project boundary are within the existing transmission right-of-way administered by BPA.

²⁹ Washington DOE states in the WQC (Appendix M) that the consumptive portions of Klickitat PUD's water right that would be available to FFP would total 4,137 acre-feet per year.

rate of 21 cfs and up to a maximum rate of 35 cfs. Because 7,640 acre-feet of water is needed to initially fill the reservoirs, FFP proposes to complete the initial fill over a 7-month period spanning two calendar years (i.e., between September 1 and March 31) consistent with its water agreement with Klickitat PUD.³⁰

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.³¹

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.³² 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 (Appendix A) 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.

³⁰ FFP updated its proposal for conducting the initial fill of the project reservoirs in its comments on the draft EIS filed on June 6, 2023.

³¹ 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.

³² 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 does not 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.

FFP does not propose a schedule or time window for refilling the reservoirs on an annual basis after the initial fill is completed. 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:³³

Geology and Soils

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

³³ 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.

- 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.³⁴
- Implement a Draft Cleanup Action Plan for the WSI that includes methods and procedures for excavating and disposing of contaminated soils and liner materials during construction of the lower reservoir.³⁵

Aquatic Resources

- Initially fill the project reservoirs between September 1 and March 31 to prevent project-related flow reductions in the Columbia River that could delay salmon smolt migration.
- As part of the proposed Draft Cleanup Action Plan, decommission 10 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.³⁶
- 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.

³⁴ 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.

³⁵ 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*. FFP initially proposed to implement a “West Surface Impoundment Plan” with procedures for excavating and disposing of contaminated soils and liner materials during construction and a “Monitoring Well Plan” with procedures for decommissioning groundwater monitoring wells impacted by construction and installing new wells. FFP filed both plans on November 20, 2020. In its June 6, 2023, comments on the draft EIS, FFP informed Commission staff that it had revised its proposal to implement a single “Draft Cleanup Action Plan” dated November 24, 2021, that it had developed in consultation with Washington DOE. This draft plan combines the previous two plans and contains updated procedures for both disposing contaminated soils and liner materials and decommissioning monitoring wells and installing new wells. FFP did not file a copy of the “Draft Cleanup Action Plan” with the Commission; however, staff accessed a public version of the draft plan online at Washington DOE’s website at <https://apps.ecology.wa.gov/cleanupsearch/document/107675>.

³⁶ 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 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 includes 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 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 and Planting Plan³⁷ 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 streams labeled 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;³⁸ (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 on-site to reduce wildlife collisions.

³⁷ 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.

³⁸ 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.

- To mitigate for the permanent loss of wildlife habitat, work with FWS and Washington DFW to select and purchase 277 acres³⁹ 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 as part of the proposed 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 schedules and any associated road closures or delays with Washington DOT and Klickitat County to prevent interruption to recreational traffic.

Cultural Resources

- Implement a HPMP filed on January 25, 2022, 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

³⁹ 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.

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 off-site 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 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 traffic control measures identified in consultation 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, the conditions required by the Washington DOE Clean Water Act section 401 water quality certification (WQC) included in Appendix M;⁴⁰ and staff's recommended modifications and additional measures described below.⁴¹

Geology and Soils

- Ensure that the soil erosion and sediment control plan contains construction measures and BMPs consistent with WQC conditions G.1, G.2, G.3, G.5, G.6, G.7, G.8, G.9, G.10, G.11, and G.16.⁴²

⁴⁰ The WQC conditions require FFP to file finalized plans for Washington DOE's approval (i.e. Dewatering Plan, Stormwater Pollution and Prevention Plan, Cleanup Action Plan for the West Surface Impoundment, Spill Prevention Plan, Water Quality Monitoring Plan, Wetland Mitigation and Planting Plan). These finalized plans would also need to be filed for Commission approval before construction could begin.

⁴¹ If Klickitat PUD's existing water pump station, infiltration gallery, conveyance pipe, and water supply vault are determined by the Commission to be licensed project works, then FFP could be required to enclose these facilities within the project boundary, file updated project boundary exhibits, and maintain these facilities for the term of any license issued. If a license is issued, a project boundary determination will be made in the license order.

⁴² The WQC conditions require erosion and sediment control measures such as marking all clearing limits, stockpiles, staging areas, and trees to be preserved prior to construction and ensuring stock piles and staging areas are located a minimum of 25 feet from wetlands and surface waters; installing high visibility construction fencing around environmentally sensitive

- Include the following fugitive dust control measures in the soil erosion and sediment control plan: (1) a surface/roadway watering plan; (2) a monitoring and response plan to identify and address periods of significant dust emission; (3) a provision to identify a threshold high windspeed to stop material movement and processing to prevent significant dust emission events; (4) roadway speed limits to limit dust entrainment; (5) haul truck cleaning and load covering requirements; (6) responsible officials and training procedures; (7) record keeping and reporting schedules; and (8) community/citizen reporting forms/phone-line and contact information to report dust impact events.

Terrestrial Resources

- Modify the proposed Vegetation Management and Monitoring 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 (identified in consultation with the Tribes) 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) provisions to conduct pre-construction surveys for peregrine falcons and ferruginous hawks (in addition to surveying other raptor species already identified in the plan); (2) provisions to conduct pre-construction surveys for Dalles sideband snail, northwestern pond turtle, monarch butterfly and its preferred milkweed host plants, 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, criteria for deciding whether additional deterrents or modifications to the project are needed, and a schedule for filing monitoring reports with FWS, Washington DFW, Oregon Department of Fish and Wildlife (Oregon DFW), Yakama Nation, Umatilla Tribes, Warm Springs Tribes, and Nez Perce Tribe; 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.
- If the monarch butterfly or its host plants are determined to be present based on the pre-construction surveys, develop a monarch butterfly management plan that includes measures

areas (such as wetlands, wetland buffers, riparian buffers, and mitigation areas); using seed mixes consisting of native, annual, and non-invasive plant species; disposing excavated sediment in approved upland disposal sites; re-introducing water into mitigation stream channels gradually at a rate not higher than the normal flow; not using hay or straw on exposed or disturbed soil at mitigation site(s), etc. See Appendix M for the list of the conditions.

to protect the butterfly's habitat, such as fencing off occupied areas or including milkweed in its revegetation seed mix.

- 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.

Threatened and Endangered Species

- Limit initial fill and periodic refill of the project reservoirs to between September 1 and March 31 to minimize project-related flow reductions in the Columbia River that could delay salmon smolt migration.

Recreation Resources

- Develop the visual resources and recreation management plan in consultation with the National Park Service and Tribes and include a provision in the 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 (BIA), and Tribal governments through the Columbia Inter Tribal Fish Commission, in addition to Klickitat County and Washington DOT.

Cultural Resources

- Revise the proposed HPMP to include specific treatment measures for all affected archaeological 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 specific 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; (3) surveying the archaeological sites using specially trained canines for historic and prehistoric human remains detection to minimize the potential for disturbing any undetected burial sites; and (4) 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 visual resources, 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* and in Appendix G.⁴³

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, 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 CGA smelter.

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

⁴³ 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; May 24, 2022; and October 10, 2023.

about 13 inches/year.⁴⁴ 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),⁴⁵ 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.

⁴⁴ 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.

⁴⁵ 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, aesthetics, 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* and in Appendix G.

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 in Appendix A). 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 liquefaction⁴⁶ 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: (1) the former CGA smelter site and proposed lower reservoir area; (2) the proposed upper reservoir area; and (3) 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, is undergoing investigation and cleanup by the potentially liable parties (i.e., NSC Smelter 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 SWMU 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

⁴⁶ 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 in Appendix B). 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 in Appendix B).

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 in Appendix B).

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 the 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 169,700 cubic yards of materials would need to be removed. There are no other SWMUs located within the project boundary or that would be disturbed by project construction and operation.

FFP prepared a Remedial Investigation and Feasibility Study and Draft Cleanup Action Plan in consultation with Washington DOE, that includes methods for excavating and disposing of contaminated soils and liner materials associated with the WSI.⁴⁷ Consistent with WQC conditions B.4 and D.3 (Appendix M), FFP is preparing a Revised Remedial Investigation and Feasibility Study and finalizing the Draft Cleanup Action Plan in cooperation with Washington DOE and parties involved in cleanup of the CGA smelter site, which is to be completed prior to mobilizing any equipment or personnel to the site. These reports would describe 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 a 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 10 of the 15 groundwater monitoring wells that were installed to monitor groundwater quality at the smelter as part of the site cleanup. Under the cleanup 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. 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). A Washington Licensed Well Operator, under the supervision of a Washington Licensed Geologist, will install

⁴⁷ The Remedial Investigation and Feasibility Study dated November 21, 2021, is publicly available on the Washington DOE's website at: <https://apps.ecology.wa.gov/cleanupsearch/document/107674>. The Draft Cleanup Action Plan dated November 21, 2021, is publicly available on the Washington DOE's website at: <https://apps.ecology.wa.gov/cleanupsearch/document/107675>. Accessed February 1, 2024.

replacement monitoring wells following requirements for drilling, casing, and well completion as required by WAC 173-160.

The Environmental Groups recommend 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 aboveground 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 implement a Draft Stormwater Pollution and 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 as 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.

Since the issuance of the draft EIS, Washington DOE issued a WQC for the project. The WQC includes conditions to control erosion and monitor the effectiveness of the control measures. Specifically, the WQC requires FFP to (1) finalize and submit for agency approval the Stormwater Pollution Prevention Plan; (2) ensure construction stormwater, sediment, and erosion control BMPs are in place before starting construction and maintain the BMPs throughout the duration of the activity; (3) if seeding is used for temporary erosion control, use a seed mix consisting of native, annual, non-invasive plant species; (4) ensure stock piles and staging areas are located a minimum of 25-feet, from waters of the state, including wetlands and their buffers; (5) ensure trucks hauling soil or contaminated media off-site implement protective measures to avoid dust escaping or leaching; and (6) ensure all excavated sediment is disposed of in an approved upland disposal site.

In addition, in comments on the draft EIS, EPA recommends that the fugitive dust control component of the erosion control plan include: (1) a robust surface/roadway watering plan, possibly including chemical dust control and/or gravel roadway cover if necessary; (2) a robust monitoring and response plan to identify and address periods of significant dust emission; (3) consideration of weather conditions including a threshold high windspeed for stopping material movement and processing to prevent significant dust emission events; (4) roadway speed limits to limit dust entrainment; (5) haul truck cleaning and load covering requirements; (6) identification of responsible officials and training procedures; (7) record keeping and reporting schedules; and (8) community/citizen reporting forms/phone-line and contact information to report dust impact events.

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 Pollution and Prevention 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. The additional details required by the WQC and recommended by EPA would make the erosion and sediment control plan and Stormwater Pollution and Prevention Plan more robust and improve monitoring and reporting requirements thereby minimizing the potential release of soil, sediment, and fugitive dust. 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 liquefy 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, Inc., 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 drain 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 in this portion of the project drain directly to the Columbia River.

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 impounds 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. 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 (National Drought Mitigation Center, 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 (Union of Concerned Scientists, 2011).

The Columbia River is highly regulated with a variety of management features related to irrigation, flood control, power generation, and environmental requirements. The U.S. Geological Survey (USGS) operates a streamflow gage at The Dalles Dam. Table 3.3.2-1 (Appendix B) 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 proposed project lands are separate and distinct from those of the northern portion. Groundwater found in the basalt aquifers of the southern portion 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. Groundwater found in the basalt aquifers of the northern portion of the project flows generally westward toward the Swale Creek watershed. While some springs were identified outside where project facilities would be located, groundwater in these areas 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)⁴⁸ list includes Lake Umatilla as 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

⁴⁸ 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.

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. Table 3.3.2-2 (Appendix B) shows Washington DOE’s water quality standards required for surface waters of freshwater environments to support aquatic life (salmon spawning, rearing, and migration). Additionally, Washington DOE designated the first 12 miles of Swale Creek from the mouth 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 13°C (55.4°F).

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.⁴⁹ 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.⁵⁰

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-acre) 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.

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). 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

⁴⁹ WAC sections 173-201A-240 and 173-201A-250 describe the toxic and radioactive substances criteria.

⁵⁰ WAC section 173-201A-230 provides guidance on establishing lake nutrient standards to protect aesthetics.

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, of which 4,137 acre-feet is currently available for the project. The Washington DOE certification requires FFP to plan its initial fill to occur across a 2-calendar-year period (e.g., about 3 months at the end of one calendar year and the first 3 months of the subsequent calendar year) to comply with the Klickitat PUD water right. Since the issuance of the draft EIS, FFP has clarified that it proposes to conduct the initial fill over two calendar years (consistent with the WQC condition) and that it also agrees not to withdraw water for the initial fill between April 1 and August 31 to prevent further reductions in Columbia River flow that could delay salmon smolt migration.

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 downstream of the project. They also express concern that project withdrawals would affect water quality and quantity in the Columbia River. As discussed further in section 3.3.3.2 *Fisheries Resources, Environmental Effects*, NMFS and Interior issued revised section 10(j) recommendations in response to the draft EIS. Both NMFS and Interior recommend that FFP not withdraw water from the Columbia River for the purpose of initial fill or annual refills at any time from April 1 to August 31 for two primary reasons: (1) to ensure sufficient Columbia River flows for outmigrating juvenile salmonids and (2) to reduce the likelihood of entrainment in the intake pool. In comments on the draft EIS, American Rivers and Washington DFW state that they support the seasonal water withdrawal restriction for both initial fill and refill as recommended by NMFS and Interior.

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.⁵¹

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. Nonetheless, avoiding water withdrawals between April 1 and August 31 to fill and refill the reservoirs would prevent project operation from contributing to consumptive water withdrawals from the Columbia River, which would prevent the project from affecting salmon smolt outmigration (discussed in further detail later in section 3.3.3.2, *Fisheries Resources, Environmental Effects*).

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 on-site 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 implement a Spill Prevention Plan to address potential issues resulting from spills of hazardous substances during construction, operations, or maintenance. The Washington DOE certification requires revising the plan to include: (1) a description of project operations; (2) the general types of oil or hazardous materials that would be used and stored on-site; (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 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). Required 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

⁵¹ 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.

into surface waters, which could degrade water quality and adversely affect fish and wildlife. FFP's proposed measures (as modified by the WQC conditions) for inspecting construction equipment, storing hazardous materials, maintaining equipment on site to cleanup unintentional spills, and educating employees are practices known to minimize the effects of a release of hazardous substances and other pollutants 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 warrant concern, appropriate measures to address the deteriorating water quality 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 nonattainment 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.

In comments on the draft EIS, American Rivers states that it is also concerned with eutrophication and the potential release of nutrient rich and warm water from project reservoirs on surface and ground water sources, as well as potentially hazardous mercury levels in project reservoirs.

The Washington DOE certification requires FFP to finalize the Draft Reservoir Water Quality Monitoring Plan for agency approval; monitor reservoir water quality per the plan; and ensure any reservoir water discharges to Swale Creek meet applicable water temperature, pH, and dissolved oxygen criteria.⁵²

Our Analysis

Eutrophication is the buildup of nutrients in a waterbody, typically phosphorous or nitrogen, which 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 the intake pool. However, continued pollutant and nutrient loading in the Columbia River is expected due to farming activities, industry, and urban and agricultural runoff. 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, such as a failure of the reservoir, underground penstocks, or overfilling of the reservoir, could result in an unexpected discharge. 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

⁵² WQC condition C.2 (Appendix M) requires the following water quality criteria be met for any reservoir water discharged to Swale Creek: (1) Temperature – February 15 through June 1, the 7-day average daily maximum temperature must not exceed 16 degrees Celsius (60.8 degrees Fahrenheit); (2) pH – within the range of 6.5 to 8.6 with a human-caused variation within the above range of less than 0.2 units; and (3) dissolved oxygen – 10 milligrams per liter or 95 percent saturation.

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.⁵³ 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 as modified by the WQC conditions 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 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 or Swale Creek are anticipated during project operation. Monitoring water quality in the upper reservoir would assist FFP in complying with the WQC requirement to ensure any planned discharge to Swale Creek meets applicable water quality criteria for temperature, pH, and dissolved oxygen if a discharge is needed.

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.

In addition to finalizing the Dewatering Plan and submitting the plan for Washington DOE approval, the WQC conditions require that the outfall or method of discharge be designed

⁵³ 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.

and operated so as not to cause erosion or scour in state waters, banks, or vegetation and that all equipment associated with dewatering activities be properly operated and maintained.

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 as modified by the WQC conditions would allow FFP to collect and monitor groundwater during construction and ensure that its contents are not contaminated. FFP's proposed reservoir liners 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 BNSF railroad embankment and water is drawn into the pool from the Columbia River via seepage through the embankment material and at least one culvert that connects the pool with the John Day Reservoir (i.e., Lake Umatilla) on the Columbia

River. 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. While it is unclear how these fish are entering the intake pool, FFP has suggested their presence may be 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,⁵⁴ 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, *Threatened and Endangered Species*, for more details). 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).

Table 3.3.3-2 (Appendix B) shows the passage timing of upstream migrating ESA-listed adult salmonids and downstream migrating ESA-listed juvenile salmonid smolts passing both John Day Dam and the Dalles Dam based on tagging data from 2012-2021. The tagging data show that ESA-listed adult salmonids migrate upstream from April through October. Snake River spring and summer-run Chinook, and Snake River sockeye migrate earlier in the summer and adult fall-run Chinook and steelhead migrate in the late summer and fall months. The tagging data shows that the majority (i.e., 90 percent of detections) of ESA-listed salmonid smolts migrate downstream past John Day Dam and the Dalles Dam from April through August each year.

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),

⁵⁴ An adfluvial life history pattern is when fish spawn and rear in tributary streams before to lakes or reservoirs to mature.

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 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; and non-listed 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*.

In its revised 10(j) recommendations, NMFS and Interior recommend that FFP not withdraw water from the Columbia River for initial fill or annual refill at any time from April 1 through August 31 to ensure sufficient Columbia River flows for outmigrating juvenile salmonids and to reduce the likelihood of entrainment into the intake pool during peak migration periods. NMFS states that the volume of flow in the Columbia River is strongly correlated with migration speed, ocean entry, and the survival of outmigrating 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 is concerned that further reductions in spring/summer Columbia River flows could increase the time and energy it would take for juvenile salmonids to migrate downriver to ocean habitat, which increases their exposure to native and non-native predators and reduces survival rates. NMFS also reasons that FFP would have a seven-month window (i.e., September 1 through March 31) to fill the reservoirs over two calendar years which is something FFP will likely need to do anyway given the constraints of the consumptive water right that FFP would be operating under. Thus, NMFS contends that its recommended timing restriction would not cause delays in filling the reservoirs as staff suggested in the draft EIS.

In comments on the draft EIS, American Rivers and Washington DFW also support the seasonal water withdrawal restriction for both initial fill and refill as recommended by NMFS and Interior. The WQC requires FFP to conduct its initial fill over two calendar years but does not stipulate a time window for the initial fill or refill.

Following the issuance of the draft EIS, FFP clarified that it intends to complete the initial fill over two calendar years and agrees to not withdraw water from the Columbia River for initial fill of the reservoirs from April 1 to August 31 as recommended by NMFS and Interior. However, FFP states it opposes the agencies' recommended restriction for prohibiting withdrawal of periodic make-up water from April 1 to August 31. FFP asserts that refill should not be restricted annually because (1) the water used to fill and refill the reservoirs would be purchased from Klickitat PUD; (2) Klickitat PUD's diversion of water and its exercise of its existing water right are not attributable to the proposed project and cannot be considered an effect of the project because Klickitat PUD could continue to exercise its water right whether the project could or could not use water during the defined timeframe; and (3) the amount of water withdrawn by the project is negligible so the minor annual withdrawals would not impact salmon.

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 Biological Opinion (NMFS, 2020) for the operation of the Federal Columbia River Power System which sets flow targets based on water supply forecasts (i.e., projected runoff volume). 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 (Appendix B). 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 seven 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 Biological Opinion were established later (June 1980 and 2008, respectively), the proposed project would not result in any new appropriation from the Columbia River or its tributaries. However, because the quantity of water required for initial fill (7,640 acre-feet) exceeds Klickitat PUD's annual consumptive water right (4,851 acre-feet of which 4.137 acre-feet is currently available), the initial fill must occur over a two-calendar year period.

The maximum rate at which FFP would receive water drawn from the intake pool through Klickitat PUD's pump station (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.⁵⁵ 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 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.

Although project water withdrawals are temporary and small relative to the flows in the river, avoiding the peak salmon smolt migration period (April through August) would prevent the project from contributing to existing demands placed on river flows from irrigation and other withdrawals in the basin during this critical migration period. In its application, FFP states that it has some flexibility in the timing of annual refills, indicating that refills could occur once per year, or over multiple, shorter withdrawals per year, depending on site conditions. We estimate that it would take about 8.6 days to refill the reservoir with 360 acre-feet of water at 21 cfs (projected average annual refill rate). Given FFP's stated flexibility in refilling the reservoirs and the short time that would be needed to complete the refill, avoiding refilling of the reservoirs during the peak smolt migration period should not pose a significant problem to project operation.

Entrainment

There is at least one unscreened 120-foot-long, 42-inch-diameter culvert, and possibly two, running through the railroad embankment that may provide periodic fish passage into the intake pool from the Columbia River. 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 project water withdrawals could cause fish to become entrained in the intake pool and be lost. Both Interior and Washington DFW believe the intake pool and Klickitat PUD's pump station should be considered project facilities.

In its revised 10(j) recommendations along with its comments on the draft EIS, NMFS and Interior recommend that that FFP and/or Klickitat PUD file a written commitment to screen the known culvert consistent with NMFS' fish screening guidance prior to the project beginning initial fill operation. NMFS and Interior also state that if a written agreement to screen the culvert cannot be filed, then FFP, in cooperation with NMFS and other interested resource agencies and Tribes, should conduct a fry and juvenile fish entrainment survey in Klickitat PUD's intake pool within 12 months of license issuance to help inform the need for screening. In comments on the draft EIS, the Environmental Groups, American Rivers, and the Yakama

⁵⁵ 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.

Nation support a fry and juvenile entrainment survey within the intake pool. In comments submitted on the draft EIS, Klickitat PUD expressed a willingness to work with the BNSF Railway Company to screen the culvert.

Interior also recommends that if FFP schedules its annual refill of the reservoirs between the peak smolt outmigration period of April 1 through August 31 and the railroad culverts are not screened and no juvenile salmonid survey has been conducted, then FFP should develop a water flow and smolt monitoring plan prior to withdrawing water during this period and that includes provisions for: (1) monitoring the flow rate of water into the culvert prior to and during withdrawals; (2) documenting smolts observed in and around the culvert; and (3) reporting results to the resource agencies.

Regarding Klickitat PUD's existing infiltration gallery and pump station within the intake pool, the Environmental Groups recommend 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, the Yakama Nation, The Umatilla Tribes, Nez Perce Tribe, and Warm Springs Tribe to prevent the entrainment, impingement, or injury of salmon, steelhead trout, bull trout, Pacific lamprey, and other resident native fish. Interior as well as Washington DFW recommend pursuant to section 10(j) that if Klickitat PUD's infiltration gallery fails or needs repair, FFP should then consult with the resource agencies and make the infiltration gallery conform to NMFS and Washington DFW fish screen criteria. Additionally, Interior recommends that FFP develop a plan to monitor the effectiveness of the existing infiltration gallery and any screens installed on the culverts and that the plan include corrective actions in the event these structures fail.

In its reply comments and in its comments submitted on the draft EIS, 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

Culvert Screening, Anadromous Fish Survey, and Water Flow and Smolt Monitoring Plan

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 Pre-Application Document provided to FFP by the BNSF 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 on the intake pool side and 255.2 feet MSL on the John Day Reservoir side of the embankment. The approximate length of that culvert is 120 feet from end to end.

FFP asserted in the license application 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 pointed out in its comment letter filed May 23, 2022, 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 toward the Columbia River and water does not flow toward 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.

As stated earlier, the majority (i.e., 90 percent of detections) of juvenile ESA-listed anadromous salmonids migrate past the project from April through August each year. While there is no evidence that ESA-listed salmon are regularly entering the intake pool from the Columbia River, it is possible that some outmigrating smolts may find their way into the intake pool during the peak smolt outmigration season. If fish pass into the intake pool, staff assume the only way that they 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 21-35 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 any interstitial spaces within the railway berm materials. 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. Regardless, because the intake pool is known to support piscivorous fish species, it is reasonable to assume that any juvenile salmonids entering the pool would likely be lost to predation.

Installing screens on the culvert in the railroad berm that meet or exceed NMFS and Washington DFW criteria would likely prevent ESA-listed smolts and other fish from entering the intake pool throughout the year. Surveying for ESA-listed fry and juvenile fish presence in the intake pool during the spring/summer salmonid smolt outmigration period as recommended by NMFS, Interior, and others would help to determine whether outmigrating salmonids are entering the pool through the culvert and would inform the benefits of screening to protect fish. Similarly, Interior's recommended water flow and smolt monitoring plan would help determine if smolts are entering the intake pool through the culvert and the project's effect of the refill on intake pool levels. However, filling and refilling the reservoirs outside the peak salmon migration season would also reduce the likelihood of outmigrating salmonid smolts from becoming entrained within the intake pool due to project-related water withdrawals regardless of whether the culvert is screened. Further, unless the Commission determines that these structures should be licensed project facilities, the Commission would not have the authority to require screening any culverts within the railroad embankment berm.

Intake Fish Screen

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 gallery⁵⁶ with no intake screen. 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. 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 that currently services one agricultural customer and one industrial customer at the smelter cleanup site.

Even if fry and juvenile anadromous fish can enter the 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 1970s, and there is no information in the record that suggests its operations have been adversely affecting fish. In comments on the draft EIS, Interior states that "while [an] infiltration gallery is not the preferred method of fish screening, the FWS acknowledges that it has been reviewed by engineers and deemed sufficient to mitigate entrainment concerns, in this case." Therefore, there appears to be no environmental benefit from modifying the existing intake or installing new or modified screens on Klickitat PUD's intake works.

Regarding maintenance, there is no information in the record to suggest that Klickitat PUD's intake is not functioning properly, needs repair, or is entraining fish. Regardless, if the Commission determines that the infiltration gallery, pumping station, and culverts should be included as project facilities, then FFP could be required to ensure that they are maintained. If the Commission determines they should not be included in the license as project facilities, the Commission would not have the authority to require its maintenance, replace the infiltration gallery with screens that meet NMFS's screening criteria, or monitor the effectiveness of any new screens.

⁵⁶ 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.

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, 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 (Appendix A). 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 State Road 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 Washington Department of Natural Resources (Washington DNR) considers the Inter-mountain Basins and Cliffs habitat stable (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 Washington 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, spring beauty, 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 a 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 in Appendix B). 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 (see figures 3.3.4-2a and 3.3.4-2b in Appendix A). 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 Nation's and other Tribe's cultural identity today. Shellenberger et al. (2019) reports that a number of plants important to the Yakama Nation occur in the project area, including smooth desert parsley, biscuitroot, and serviceberry (see table 3.3.4-2 in Appendix B).

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 is unknown but notes that there are reports of 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 shrub-steppe, 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 homogeneous 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 RPHs (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 right-of-way 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 in Appendix B and shown on figures 3.3.4-3a and 3.3.4-3b in Appendix A. 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 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 State Road 14 and on the CGA smelter site were also delineated.

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 foraging 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, 2006; 2008). Oregon DFW has also reported the presence of 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., 2007) 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 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 impact 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).

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 proposed 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, 2022a; 2021a; Ecology and Environment, Inc., 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 and 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 and around the project and throughout much of eastern Washington.

Elk are also known to pass through the proposed project lands 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 project lands.

Of the 15 bat species that occur in Washington State, 14 are expected to occur in Klickitat County (Washington DFW, 2021b) and 11 were documented in surveys within 11 miles of the proposed project (WEST, 2006). Bat species documented near the project include Townsend's big-eared bat, a state candidate species (Washington DFW, 2021b). Resident species with a high likelihood of occurring at the project 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 and are expected to be most common in summer and fall (Washington DFW, 2021b; WEST, 2006). Little brown bat, a state priority species, is documented in and around the project. 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%), followed by 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 at the project. Small bodies of water such as ponds, streams, and wetland areas at and near the project 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 project lands, 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 Washington DFW Priority Habitat Species Candidate for the State's 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 (see table 3.3.4-5 in Appendix B). 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 Basins 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, but the amount temporarily lost at the project would be small and no oaks were identified in the habitat. Given the absence of oaks, western gray squirrel preferred habitat does not exist at the project site, and western gray squirrels are not likely to occur at the site.

To minimize effects on vegetation, FFP proposes to implement a Vegetation Management and Monitoring Plan 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 and FFP proposes to finalize the plan in consultation with the resource agencies during final project design. 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 an established species assemblage similar to a reference ecosystem and that would provide an appropriate community structure consisting 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 Vegetation Management and Monitoring Plan 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 Vegetation Management and Monitoring Plan, but would modify the plan to include the following elements:

- Invite Washington DFW, Oregon DFW, Washington National Heritage Program (Washington NHP), and FWS to participate in pre-construction surveys to assist in identifying botanical resources and to plan avoidance measures for construction and operation of the project.
- Include both upland shrub-steppe and riparian areas in pre-construction surveys since sensitive plants can occur in both habitats.
- Conduct pre-construction plant surveys 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.
- Document and avoid disturbance of all sensitive plants.
- Use locally adapted genetic materials in the native seed mix.
- Consult resource agencies (Washington DFW, Washington NHP, Oregon DFW, FWS) 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.
- Consider supplemental plantings of containerized plants or bareroot nursery stock (including plants of cultural or spiritual importance) based on the results of pre-construction surveys and the availability of suitable source material. If included as part of the revegetation plan, these would be installed in the fall to maximize likelihood for successful establishment.
- Monitor all revegetated areas 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, the areas would be re-treated and monitored for an additional five-year period.
- Control any Class A noxious weeds detected in areas of previous ground disturbance and permanent features using appropriate mechanical, biological, and chemical treatments that meet the requirements of state and federal law and 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.

- Implement fire suppression measures during construction and operation to minimize potential damage to wildlife habitat.

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

The Washington DOE WQC certification (Appendix M) also requires that seeding used for temporary erosion control be a seed mix consisting of native, annual, non-invasive plant species.

In comments submitted on the draft EIS, American Rivers recommends that FFP consult with affected Tribes in developing and finalizing its Vegetation Management and Monitoring Plan.

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 the 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 (i.e., CGA smelter facilities and nearby wind turbines), 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 as 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 U.S. 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, as proposed by FFP and recommended by Interior, and with affected Tribes, as recommended by American Rivers, 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 as 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 provide more permanent and ecologically functional plant communities would 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 environmental resources.

FFP's proposed Vegetation Management and Monitoring Plan, as modified by the WQC conditions, 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, FFP identified nine wetlands and waterbodies at the project. Of these, constructing the proposed project would result in the loss of all of Pond/Wetland P2 (0.027 acre). This feature is not 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 and approximately 0.003 acre (75 linear feet) of ephemeral Stream S8 (see Figure 3.3.4-4b in Appendix A).⁵⁷ The total permanent stream impacts would be 0.044 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 and a small portion of Stream S8 would be lost (table 3.3.4-7 in Appendix B). 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 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 right-of-way would not be directly impacted by the proposed project.

To mitigate the effects on streams S7 and S8 and ensure that construction does not cause changes to downstream wetland functions, FFP proposes to implement a Wetland Mitigation and Planting Plan that would be finalized during final project design that includes (1) evaluating the viability of establishing and rehabilitating a new stream course on-site at a minimum 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) 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 met for vegetative cover, species composition, and invasive plants.

Because stream S7 has a limited hydroperiod and does not provide wetland or riparian functions, but rather acts 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 this stream so that downstream habitats maintain pre-construction amounts of flow. If there is a viable location to construct a new stream course, FFP would construct one 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

⁵⁷ After reviewing FFP's "Wetlands and Waters Delineation Report Rev 3" and updated jurisdictional wetland determination forms filed on October 10, 2023, staff revised the final EIS text to remove references to Wetland A, Wetland B, Stream 1, and Stream 2 and adjusted the numbers of project area wetlands and streams accordingly. However, because staff used figures from Washington DOE's final EIS that we could not modify, they still show the wetlands/streams determined not to be jurisdictional.

functional resources. The new drainage would follow natural topography to the extent possible, while providing for slight meanders, softening bank grades, instream structures to slow flow, and changes in depth to prevent down cutting. If construction is necessary, FFP would seed and/or plant 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, FFP would remove all temporary fill materials and underlying geotextile fabric and conduct a post-construction survey to determine which construction methods would 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.

The Washington DOE WQC conditions (Appendix M) require FFP to: (1) fence environmentally sensitive areas including, but not limited to, wetlands, wetland buffers, riparian buffers and mitigation areas with high visibility construction fencing (HVF), prior to commencing construction activities; (2) train all field staff to recognize HVF, understand its purpose and properly install it in the appropriate locations; (3) locate stock piles and staging areas a minimum of 25-feet from waters of the state, including wetlands and their buffers; (4) prevent the entrance, operation, storage, or parking of equipment within any sensitive area; and (5) mitigate wetland impacts as described in the Wetland Mitigation and Planting Plan, including monitoring and reporting requirements. The WQC also requires FFP to monitor wetlands W6, W1, and W2 during construction and for five years after construction is complete to ensure that the project does not affect their hydrology. Monitoring would consist of using the currently approved federal wetland delineation manual and appropriate regional supplement to delineate wetlands W6, W1, and W2 every year during the wettest portion of the growing season.

Our Analysis

Constructing the upper reservoir would result in the loss of 1.15 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 would further minimize 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, as modified by the WQC conditions.

Other streams (S17 and S24) and wetlands (W6) located near the area of the lower reservoir are not addressed in FFP's 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.

Wetlands W6, W1, and W2 are small wetlands along State Road 14 (Figure 3.3.4-3a in Appendix A) that appear to be supported by groundwater seeps. No project construction activities are expected to occur in these areas and no project effects on these wetlands are expected. However, agencies are concerned that drilling for the penstock and other underground features could affect the hydrology supporting these wetlands. Monitoring as required by the WQC would determine if there were any changes in their supporting hydrology during and immediately following construction.

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 associated 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 (Cabrerá-Cruz et al. 2018; Wiltscko et al. 1993; Kempnaers 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;⁵⁸ (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

⁵⁸ 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.

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 acres⁵⁹ off-site land and manage the land to provide golden eagle nesting and foraging 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. In comments on the draft EIS, the Yakama Nation state that ferruginous hawks should be addressed in addition to other raptor species.

Interior recommends pursuant to section 10(j) that FFP develop an avian protection plan that includes conducting pre-construction surveys for birds, nests or roosts and establishing buffers for construction activities. The avian protection plan 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. In comments on the draft EIS, Oregon DFW also supports development of an avian protection plan that includes measures for documenting and reporting bird mortality and addressing problem poles.

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 (Washington

⁵⁹ 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.

DFW, 2022a) and activities would be conducted during daylight hours when deer activity is likely less.

Although lands within and near the project have experienced significant development (e.g., wind farms, a decommissioned aluminum smelter, John Day Dam), which has reduced habitat quality for golden eagles, these lands still provide 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. Additionally, ferruginous hawks inhabit lands in and around the project site. 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 February 15 to July 15 (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) indicate that 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- to 0.5-mile 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- to 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, ferruginous hawk, 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 kilometers 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 Washington DFW 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 REA Notice, Washington DFW recommended 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 stated that it only recently became aware that these species may be present in the area.

FFP did not address these species in the license application or respond to Washington DFW's 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 which could disturb some sensitive wildlife at the project. 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 birds and bats 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) using directional lighting to manage light pollution that could disorient migrating and nocturnal birds; (2) installing a chain link fence that is at least 8 feet high around the reservoirs to prevent animals from gaining access to the reservoirs; (3) marking all fences with vinyl strips and/or reflective tape to reduce avian collision risks; (4) preventing the establishment of vegetation around the reservoirs to reduce their attraction to wildlife; (5) covering 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) monitoring for and removing carcasses of livestock and other animals from the project area that may attract scavenging wildlife, foraging eagles, or other raptors; (7) developing a monitoring program to identify bird and mammal usage of the reservoirs and measure the effectiveness of wildlife deterrents; and (8) developing a reporting system to document wildlife mortalities, injuries, nuisance activity, and other wildlife interactions.

Washington DFW is supportive of 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 recommends pursuant to section 10(j) that, as a component of the Wildlife Management Plan, a bird and bat reservoir deterrent management plan (wildlife deterrent management plan) be developed in coordination with Washington DFW, FWS, and the Yakama Nation. According to Washington DFW, 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 Wildlife Management Plan and license application, 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." Washington DFW also recommends that FFP submit an annual report that includes: (1) 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) additional or modified deterrent measures that are needed if the objectives are not achieved. The annual report would be submitted to Washington DFW, FWS, and the Yakama Nation for a 30-day review before FFP filed the report with the Commission on May 1 each year.

As noted above, Interior recommends that FFP include in an avian protection plan a requirement to adjust lighting systems to minimize disruption of nighttime foraging and to mark fencing around the project reservoirs to prevent avian collisions.

In comments on the draft EIS, the Umatilla Tribes recommend that they be provided copies of the monitoring reports because of the importance of the golden and bald eagles to their Tribal culture.

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. 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) 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's 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 whether 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 raptors, birds, and bats in 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.⁶⁰ 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 upper reservoir, 11 others are located further east, and two are located west of the upper reservoir (Figure 3.3.6-1 in Appendix A). 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 80 meters (or 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 squared per second squared (ft^2/s^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.

⁶⁰ 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.

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 and Watson, 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 (e.g., 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. 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.⁶¹

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 whether 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 the John Day Dam population appear to be declining and because wind energy development has been implicated as a factor in the decline of 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 entity 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 struck 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 whether 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

⁶¹ See the following article titled "Covering water reservoirs with outdoor cover balls" available at: <https://euro-matic.eu/hu/en/references/covering-water-reservoirs-with-outdoor-cover-balls/>. Also, see <https://bird-x.com/bird-products/bird-balls/>. Accessed February 1, 2024.

boundary would be needed to conduct the searches and such access would require permission from current landowner(s).

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.⁶² 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).⁶³

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 whether 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 whether the rate of mortality increases and is significant enough to require additional 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 project boundary would be needed to conduct the searches, and such access would require permission from current landowner(s).

Therefore, an effective monitoring plan would need to include methods for documenting bird and bat use before and after constructing 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

⁶² See article titled “Why Bats are Insanely Attracted to Wind Turbines?” available online: <https://electrical-engineering-portal.com/why-bats-are-insanely-attracted-to-wind-turbines#:~:text=9%20Hypotheses%20for%20Bat%20Attraction%20to%20Wind%20Turbines,8%208.%20Forest%20Edge%20Effect%20...%20More%20items>. Accessed February 1, 2024.

⁶³ 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.

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 FWS and Washington DFW. Any new poles and lines would be designed with appropriate conductor spacing and visibility enhancement devices.

Interior and Oregon DFW recommend that an avian protection plan be developed that requires constructing transmission structures according to bird protection standards and guidelines. The avian protection plan 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 the Avian Power Line Interaction Committee's guidelines in the following publications (or the most current editions of the publications): *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* (APLIC, 2012). Further, bird flight diverters would be installed on any new transmission lines and existing transmission lines that have been documented to cause mortality or have a high likelihood of causing mortality would be retrofitted. FFP would also conduct operation and maintenance activities in the project area in accordance with the most current spatial and temporal guidelines for avian protection (i.e., consistent with 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 recommended measures to minimize avian collisions with powerlines such as 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 has 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 (TWPA) wind farm, 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 such as electrocution on power distribution lines, contaminants, collisions with vehicles, and illegal shooting may be resulting in the decline of golden eagle populations nationwide (FWS, 2016). Further, wind energy development is believed to be a factor in the decline of golden eagles in the State of Washington (Watson et al., 2020). Other raptors (e.g., Swainson's and ferruginous hawk) are also susceptible to wind turbine strikes.

Constructing the project reservoirs 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 square miles 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 resulting from project construction.

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 as conditioned by the Washington DOE WQC and the overall cleanup of the smelter site by the responsible parties should reduce raptor exposure to contaminants compared to current conditions.

3.3.5 Threatened and Endangered Species

3.3.5.1 Affected Environment

Aquatic Species

Fish federally 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; NOAA, 2022). Fish federally 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 segments (DPS) (Washington DFW 2022a; 2022b; 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 runs 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 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 late 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 (i.e., spawn in rivers and rear in lakes and reservoirs) life history pattern.

Table 3.3.3-2 (Appendix B) shows the passage timing for listed salmonids at The Dalles Dam and John Day Dam. The passage timing 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.⁶⁴ Tables 3.3.5-1 through 3.3.5-3 (Appendix B) present annual and seasonal (spring through fall) passage counts of salmonids at John Day Dam since 1990.

Critical Habitat

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 (see table 3.3.5-4 in Appendix B).

Essential Fish Habitat

EFH is defined as 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 Columbia-Hood – 17070105, (2) Middle Columbia-Lake Wallula – 17070101, and (3) Klickitat – 17070106 (PFMC, 2014).

⁶⁴ 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.

Terrestrial Species

On February 3, 2023, staff accessed FWS's Information for Planning and Consultation (IPaC) database to determine whether any federally listed species under FWS's jurisdiction could occur at the project. Staff accessed it again on December 7, 2023, to determine whether there were any updates to the list since the draft EIS was issued. According to the IPaC database, the following federally listed, proposed, and candidate terrestrial species have the potential to occur within the project area: the endangered gray wolf, the threatened yellow-billed cuckoo, the threatened North American wolverine, the proposed threatened northwestern pond turtle, and the candidate monarch butterfly.⁶⁵

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.

Northwestern pond turtles require both aquatic and upland habitats that are connected to one another or within close proximity. They utilize a broad range of permanent and ephemeral water bodies including rivers and streams, lakes, natural and constructed ponds, wetlands, marshes, vernal pools, reservoirs, settling ponds, irrigation ditches, and estuaries with tidal influence (FWS, 2023). Eggs are laid in upland habitat, and hatchlings, juveniles, and adults use both upland and aquatic habitat. Terrestrial environments are required for nesting, overwintering and aestivation (warm season dormancy), basking, and movement/dispersal. Aquatic environments are required for breeding, feeding, overwintering and sheltering, basking, and movement/dispersal. While there is no documentation of northwestern pond turtles at the project and the majority of the species' habitat is located further west, the distribution of

⁶⁵ See Interior's official lists of threatened and endangered species, accessed by staff using the IPaC database (<https://ipac.ecosphere.fws.gov>) on December 7, 2023, and placed into the records for Docket No. P-14861-002 the same day.

northwestern pond turtles includes aquatic, shoreline, and upland habitats within the Columbia River Gorge that includes the project (FWS, 2023).

The project is located within the range of the candidate 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 at the project. In comments submitted on the draft EIS, Interior notes that the project is “within the spring to late summer occupancy zone” for the species and that two milkweed species, narrow-leaved milkweed (*Asclepias fascicularis*) and showy milkweed (*Asclepias speciosa*), are found along waterways in Klickitat County in the vicinity of the project.

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

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 that would require FFP to purchase an estimated 7,640 acre-feet of water from Klickitat PUD which would be withdrawn from the Columbia River and annual make-up water in the amount of 360 acre-feet also withdrawn from the Columbia River. Additionally, 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.

As discussed previously in section 3.3.3.2, *Fisheries Resources, Environmental Effects*, NMFS and Interior filed revised section 10(j) recommendations that FFP not withdraw water from the Columbia River via the intake pool for the purpose of initial fill or annual refills any time from April 1 to August 31 for two primary reasons: (1) to ensure sufficient Columbia River flows for outmigrating ESA-listed juvenile smolts and (2) to reduce the likelihood of smolt entrainment in the intake pool as a result of reservoir filling operation. American Rivers and Washington DFW also support the seasonal water withdrawal restrictions recommended by NMFS and Interior.

FFP clarified in its comments on the draft EIS that it proposes to conduct the initial fill over two calendar years and has agreed not to withdraw water to initially fill the reservoirs between April 1 and August 31 to prevent further reductions in Columbia River flow that could delay ESA-listed salmon smolt migration. FFP continues to oppose any seasonal restriction for refilling the reservoir each year after the initial fill is completed.

In addition to restricting water withdrawals, NMFS and Interior recommend that FFP and/or Klickitat PUD file a written commitment to screen the known culvert hydrologically connecting the Columbia River to the intake pool in a manner that adheres to NMFS’ fish screening guidance or conduct a fry and juvenile entrainment survey in Klickitat PUD’s intake pool within 12 months of license issuance to help inform the need for further screening. In comments submitted on the draft EIS, the Environmental Groups, American Rivers, and the Yakama Nation also indicate support for conducting a fry and juvenile entrainment survey within

the intake pool. Additionally in comments submitted on the draft EIS, Klickitat PUD expressed a willingness to work with the BNSF Railway Company to screen the culvert.

Interior also recommends under section 10(j) that if FFP schedules its annual refill of the reservoirs between the peak smolt outmigration period of April 1 through August 31 and the railroad culverts are not screened and no juvenile salmonid survey has been conducted, then FFP must develop a water flow and smolt monitoring plan prior to withdrawing water that contains provisions for: (1) monitoring the flow rate of water into the culvert prior to and during withdrawals; (2) documenting smolts observed in and around the culvert; and (3) reporting results to the resource agencies.

Regarding Klickitat PUD's existing infiltration gallery and pump station within the intake pool, the Environmental Groups recommend that FFP install and maintain fish screens on Klickitat PUD's pump station that meet or exceed NMFS and Washington DFW screening requirements. Interior as well as Washington DFW recommend under section 10(j) that if Klickitat PUD's infiltration gallery fails or needs repair, FFP should then consult with the resource agencies and make the infiltration gallery conform to NMFS's and Washington DFW fish screen criteria. Interior also recommends that FFP develop a plan to monitor the effectiveness of the existing infiltration gallery and any screens installed on the culverts within the railroad berm and that the plan include corrective measures in the event these structures fail.

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 previously discussed in sections 3.3.2 and 3.3.3, the upper reservoir would capture about 86 acre-feet per year of rainfall that currently reaches Swale Creek through tributary streams. However, this impact would be minimal relative to the 103,883 acre-feet per year of rainfall runoff that Swale Creek receives each year (Washington DOE, 2022a). Further, FFP's proposed mitigation plans as modified by the WQC conditions (i.e., erosion and sediment control plan, Spill Prevention Plan, and Stormwater Pollution and Prevention Plan) would contain sufficient provisions to minimize construction-related effects on water quality in Swale Creek and, in turn, the Klickitat River. In addition, streams S7, S8, and upper Swale Creek upstream of Warwick, Washington, are often dry in many portions; thus, 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 plans as modified by the WQC (i.e., erosion and sediment control plan, Stormwater Pollution and Prevention Plan, Dewatering Plan, Cleanup Action Plan, and Reservoir Water Quality Monitoring Plan) include BMPs and sufficient monitoring protocols to ensure that project construction and operation would not degrade water quality in the Columbia River.

As noted in section 3.3.3.2, 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. Although project withdrawals are small, temporary withdrawals relative to the flows in the river, filling reservoirs outside of the peak salmon smolt migration period of April 1 through August 31 would minimize the project's contribution to flow reductions in the Columbia River when smolts are migrating and thus would not impede ESA-listed salmon smolt migration. The seasonal restrictions would also likely minimize the potential for project withdrawals to contribute to entrainment of salmon smolts into the intake pool where they could be subject to predation.

As discussed in section 3.3.3, it is not known whether salmon and trout are able to or regularly use the intake pool. If they can enter the pool, they could become trapped if the water levels drop below the culvert intake and likely be lost to the system, likely due to predation. We do not know what the infiltration rate into the pool is or how Klickitat PUD supplying 21 cfs up to 35 cfs for the project might affect pool levels. Conducting a fry and juvenile survey within the intake pool during their migration period would determine whether juvenile anadromous salmon, steelhead, and bull trout are likely entering the pool.

Installing screens on the culvert that meet or exceed NMFS and Washington DFW criteria would likely prevent ESA-listed salmonid smolts and bull trout from entering the intake pool throughout the year. However, as discussed previously, avoiding project water withdrawals during the peak smolt outmigration season of April 1 through August 31 for initial fill and annual refill would similarly prevent project-related withdrawals from contributing to ESA-listed salmonid smolt entrainment within the intake pool. Further, unless the Commission determines that these structures should be licensed project facilities, the Commission would not have the authority to require screening any culverts within the railroad embankment berm or to enforce any written agreement filed by FFP or Klickitat PUD to screen these structures.

Even if fry and juvenile anadromous fish can enter the pool and approach Klickitat PUD's pump station and infiltration gallery, 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. In comments on the draft EIS, Interior states that "while [an] infiltration gallery is not the preferred method of fish screening, the FWS acknowledges that it has been reviewed by engineers and deemed sufficient to mitigate entrainment concerns, in this case." Therefore, there appears to be no environmental benefit from modifying the existing intake or installing new or modified screens on Klickitat PUD's existing intake works.

If the Commission determines that Klickitat PUD's infiltration gallery, pumping station, and the BNSF culvert should be included as project facilities, then FFP could be required to ensure that they are maintained. If the Commission determines these structures should not be included in the license as project facilities, the Commission would have no authority to require FFP to coordinate with the agencies to ensure that the infiltration gallery is maintained and meets

NMFS and Washington DFW screening criteria or to develop a plan to monitor the effectiveness of the existing infiltration gallery and any screens that are installed on the culvert. As discussed previously, avoiding filling the project reservoirs during the peak salmon migration season would minimize the project's contribution to entrainment of juvenile salmonids within the intake pool regardless of which entity maintains the infiltration gallery, pump station, and railroad berm culvert.

Based on the above analysis and the analyses presented in sections 3.3.2.2 and 3.3.3.2, 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, or bull trout.

Critical Habitat and Essential Fish Habitat

As discussed previously, FFP's proposed mitigation plans as modified by the WQC (i.e., erosion and sediment control plan, Stormwater Pollution and Prevention Plan, Dewatering Plan, Cleanup Action Plan, and Reservoir Water Quality Monitoring Plan) include BMPs and sufficient monitoring protocols to ensure that project construction and operation would not degrade water quality in the Columbia River and project withdrawals for reservoir filling would be small, temporary withdrawals relative to the flows in the Columbia River. Further, filling reservoirs outside of the peak salmon smolt migration period of April 1 through August 31 would minimize the project's contribution to flow reductions in the Columbia River when salmonid smolts are migrating and thus would not impede ESA-listed salmon smolt migration.

Based on the analysis above and the analyses presented in sections 3.3.2.2 and 3.3.3.2, the proposed construction and operation of the Goldendale Project is not expected to adversely affect designated critical habitat for federally listed salmon and steelhead or designated EFH for Chinook or sockeye salmon in the Columbia River.

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. In its revised 10(j) recommendations, Interior recommends that western monarch butterfly and its preferred milkweed habitat be included in pre-construction surveys and if the species or its habitat occurs in the area to be disturbed, then FFP should develop a monarch butterfly management plan in consultation with the resource agencies that includes measures to protect the butterfly's milkweed habitat.

Our Analysis

Including the butterfly and milkweed in FFP's pre-construction surveys would allow FFP to identify whether monarch butterflies or its preferred milkweed host occur in areas to be disturbed. If found, developing a monarch butterfly management plan in consultation with the

resource agencies would allow FFP to identify actionable steps to protect the butterfly's habitat, such as fencing off occupied areas or including milkweed in its revegetation seed mix.

Northwestern Pond Turtle

It is unknown whether northwestern pond turtles use the project site. However, because the distribution of northwestern pond turtles includes upland habitats along the Columbia River and Columbia River Gorge including the project, it is possible that habitat for the species could be affected by project construction.

Our Analysis

Performing a survey for the species prior to beginning construction would determine if they are present and inform the need for any protective measures, such as flagging to prevent disturbance, potentially relocating affected species, or revegetating disturbed areas with suitable plants. Therefore, staff conclude that project construction and operation is not likely to jeopardize the proposed threatened northwestern pond turtle.

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, staff conclude 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, staff conclude that project construction and operation would not affect the cuckoo or wolverine.

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 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 its Auto-Tour route, 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. 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 TWPA'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 (see Figure 3.3.6-1 in Appendix A).⁶⁶

The lower reservoir area is classified as Industrial Park which supports the manufacturing, distribution, and assembly of finished products that have relatively light impact

⁶⁶ TID states that it purchases all the energy and Renewable Energy Credits produced by the TWPA wind farm and pays all the wind farm's costs.

on adjacent uses and districts. The lower reservoir site was previously occupied by the CGA 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 right-of-way, 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 Town 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 also be accessible to persons with disabilities. 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.

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.

In comments on the draft EIS, Interior states that the project is located along and crosses portions of the Lewis and Clark National Historic Trail and the “Auto-Tour Route” for the trail (specifically State Route 14 in Washington along the north side of the Columbia River and Interstate 84 in Oregon along the south side of the Columbia River). To minimize potential visual and recreational impacts to the trail, Interior recommends that FFP develop its visual and recreation resource management plan in consultation with the National Park Service. Interior states that park service staff can advise FFP on textures, lines, colors, and forms of project components to minimize negative impacts to the Lewis and Clark National Historic Trail and has expertise with respect to location and content of interpretive signage and communications with the public/visitors.

In addition, Rebecca Sue Sonniksen (member of the public) recommends in comments on the draft EIS that FFP consult with the Tribes on the content of its interpretive facility to ensure that the facility communicates the “cultural heritage and significance of the area.”

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 Tribal 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 proposal to install an 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 details are needed before the Commission could approve its installation. Developing these details in consultation with Washington DFW, Washington DOE, the Corps, Bureau of Land Management (BLM), the National Park Service, and the Tribes would allow agencies and Tribes to share their expertise and ensure that the interpretative display is built to

appropriate standards and that effects on the Lewis and Clark National Historic Trail and “Auto-Tour Route” are minimized. 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 61 acres 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 site 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, 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 TID's 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 defining vibration criteria, to ensure no damage to the wind farm facilities. FFP would develop the plan during final design in consultation with TID.

Our Analysis

Wind Effects

FFP contracted ERM (2021b) 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 (2021b) 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 two 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 -0.034 meter squared per second squared (m^2/s^2) to 0.031 m^2/s^2 for 2014 and -0.050 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, 2021b). 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 TID's infrastructure. However, 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 BLM's Visual Resource Management (VRM) 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 State Road 14, Interstate 84, and recreational users along the Columbia River or at nearby parks and trails. State Road 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 (Appendix A) shows the locations of the five key observation points (KOPs). Figures 3.3.7-2 and 3.3.7-3 (Appendix A) 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 (Appendix A).

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 in Appendix A) 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 with 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 in Appendix A) 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 in Appendix A) 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* for more details). At an elevation of 3,000 feet above mean sea level, 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 in Appendix A) 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 in Appendix A) 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 off-site 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.

In its comments on the draft EIS, Interior states that the project could affect visual resources associated with the Lewis and Clark National Historic Trail and Auto-Tour Route, and recommends that FFP consult with the National Park Service when developing its visual resources and recreation management plan so the agency can advise on textures, lines, colors, and forms of project components to minimize negative impacts to the trail and auto-tour route.

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 Road, 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 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 (figures 3.3.7-4 and 3.3.7-5 in Appendix A). 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 Appendix A), 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 in Appendix A). 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 in Appendix A). 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 and would not be visible from that scenic area 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.

Consulting with the National Park Service in developing the visual and recreation resources management plan would allow the agency to share its expertise so that project

components are designed to reduce visual resource impacts to the nearby Lewis and Clark Trail and Auto-Tour Route and help ensure consistency with other nearby views.

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 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 Native American Tribes that might attach religious or cultural significance to such properties.

Area of Potential Effect

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. On September 29, 2021, FFP sent letters to the Washington SHPO and the Oregon SHPO requesting concurrence on the definition of the APE. The Washington SHPO concurred with the APE in a letter dated September 30, 2021. The Oregon SHPO did not respond regarding the APE but stated in a letter dated October 29, 2021, that "based on the information we have received, it appears that there will be no adverse effect to

historic properties in Oregon for this undertaking. This concludes consultation with our office under Section 106 of the NHPA (per 36 C.F.R. Part 800) for built environment resources.”⁶⁷

Cultural Historic Context⁶⁸

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.–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, Umatilla, and 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 Nation’s and Umatilla Tribes’ 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

⁶⁷ FFP filed the letters requesting concurrence on the APE and the Washington SHPO’s and Oregon SHPO’s responses on January 25, 2022.

⁶⁸ The cultural history context is adapted from FFP’s Draft HPMP filed on January 25, 2022.

(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 APE.

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. These activities occurred until at least 10 to 20 years ago. In the past, these activities served to reestablish relationships and to 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, and 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 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” (Warm Springs Tribe, 2021).

As part of the Yakama Treaty,⁶⁹ the Treaty of Walla Walla,⁷⁰ the Nez Perce Treaty,⁷¹ and the Treaty with the Tribes of Middle Oregon,⁷² 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 Sante Fe Northern route.

⁶⁹ 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>. Accessed February 1, 2024.

⁷⁰ 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>. Accessed February 1, 2024.

⁷¹ 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.washington.edu/digital/collection/lctext/id/7613>. Accessed February 1, 2024.

⁷² 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://catalog.archives.gov/id/101784625>. Accessed February 1, 2024.

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, 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 completed construction of the John Day Dam, creating Lake Umatilla (also known as 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 CGA aluminum 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 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 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 TCP 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 (labeled as sites 45KL566, 45KL567, 45KL570, 45KL744, 45KL746, and LS-3). Three sites (45KL1296, 45KL1297, and 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 and 45KL772). Shellenberger et al. (2019) also concluded that the proposed project area is within a National Register of Historic Places (National Register)-eligible TCP (*Pushpum*)⁷³ and a National Register-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).

⁷³ *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.

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 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'aliyapa* TCPs⁷⁴ discussed further below. Notably, only the pre-contact components at sites 45KL744 and 45KL746 are recommended as individually eligible and as contributing to the *Nch'ima* and *T'at'aliyapa* 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).⁷⁵ In a letter dated September 30, 2021 (filed by FFP on 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.⁷⁶

Yakama Nation—In 2021, the Yakama Nation Cultural Resources Program'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

⁷⁴ *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.

⁷⁵ In its comments on the Commission's REA 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.

⁷⁶ In its comments on the Commission's REA 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.

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 current property documentation form for the Columbia Hills MPD was updated as part of the Yakama Nation's 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. Staff believe 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'aliyapa*). One of these locations (*Pushpum*) is the same area identified by the Yakama Nation as a TCP. *T'at'aliyapa* is a large area that encompasses the rock outcroppings, fishing sites, and both shorelines of the Columbia River alongside *Pushpum*. In the project area, *T'at'aliyapa* overlaps with the TCP identified by the Yakama Nation as *Nch'ima*. Battaglia and Steinmetz (2021) concludes that both *Pushpum* and *T'at'aliyapa* are eligible for listing on the National Register. Like *Pushpum*, *T'at'aliyapa* is considered a location for gathering "First Foods" (i.e., water, fish, big game, roots, berries, and other plants) 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 by FFP on 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 believe that *T'at'aliyapa* is eligible for listing on the National Register under criteria A, B, C, and D.⁷⁷

Nez Perce Tribe—In 2021, the Nez Perce Tribe's Cultural Resources Program 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 Nez Perce 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

⁷⁷ During an October 23, 2023 conversation with Commission staff, Washington SHPO staff acknowledged Commission staff's eligibility determinations for *Pushpum*, *Nch'ima*, *T'at'aliyapa*, and verified that all Washington Department of Archaeology and Historic Preservation requirements for TCP documentation of these TCPs had been met. See memorandum summarizing communications between FERC Staff and Washington SHPO staff issued on October 24, 2023.

expressed similar concerns as the other Tribes regarding the proposed Goldendale Project in its comments on FFP's draft treatment plan for site 45KL746 submitted to FFP November 1, 2021 (filed by FFP 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* (Shellenberger, 2021), *Nch'ima* (Shellenberger, 2021), and *T'at'aliyapa* (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, including burial sites, to be identified during construction. Construction of the proposed project would occur in *Pushpum*, *Nch'ima*, and *T'at'aliyapa*, which are areas traditionally used by Tribal members 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. Finally, the project may result in indirect effects such as visual, auditory, or vibrational effects to properties of importance to Tribes.

To mitigate these effects, FFP proposes to develop a HPMP 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, Nez Perce Tribe, and Warm Springs Tribe for a 30-day review.⁷⁸ 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

⁷⁸ During a December 13, 2023, meeting between Commission staff and representatives for the Umatilla Tribes, the Umatilla Tribal representatives stated that they had not reviewed the draft HPMP because appropriate staff had not received the document. Following that meeting, FFP representatives sent a copy of the draft HPMP to Teara Farrow Ferman, the Umatilla Tribes' Cultural Resources Protection Program Manager. See meeting summary memorandum issued on January 19, 2024.

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. 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 and 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 measures (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 (filed by FFP on July 2, 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 REA Notice, the Yakama Nation 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 Nation 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 TCPs by developing a Cultural Resources Management Plan in consultation with and with the approval of all affected Tribes and that FFP be required to obtain pre-approval of any project activities from all affected Tribes.

Other Tribes did not file comments in response to the REA Notice; however, the traditional use study reports (Shellenberger, 2021; Battaglia and Steinmetz, 2021; Moon, 2021) include similar concerns expressed by Tribal members 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. FFP's draft HPMP indicates" that the Umatilla Tribes and Warm Springs Tribes both oppose data recovery and would prefer project redesign or other measures.

The Umatilla Tribes filed comments on the draft EIS and draft HPMP on January 23, 2024. The Umatilla Tribes reiterate their objection to licensing the project because project construction would either destroy or irreparably harm resources important to the Tribe. Nonetheless, the Umatilla Tribe acknowledge that the typical way to mitigate adverse effects to archaeological sites is with archaeological excavation of the site and documentation of the findings. The Umatilla Tribes recommend that the five archaeological sites affected by the undertaking be inventoried using specially trained canines for historic and prehistoric human remains detection. The Umatilla Tribes state that this effort could help minimize effects to any undetected burials in the area, preventing a later inadvertent discovery during the construction phase of the project. The Umatilla Tribe suggests that a company like the Institute of Canine Forensics provides these services and that this type of inventory can be completed in a short period of time.

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, including burial sites. Using dogs trained in searching for human remains is a non-invasive means of searching for burial sites and has been successively used in several situations.⁷⁹ Searching the archaeological sites using trained dogs and handlers as recommended by the Umatilla Tribes would help minimize the potential for inadvertently disturbing or destroying burial sites during project construction.

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 eligible for listing on the National Register. They also represent a significant part of the Yakama Nation and other Tribal traditions. Their removal would degrade the integrity and cultural significance of the TCPs and the larger Columbia Hills Archaeological District.

⁷⁹ See Institute of Canine Forensics website which contains examples where this survey method has been used: <https://www.icfk9.org/>. Accessed February 1, 2024.

The TCPs (*Pushpum*, *Nch'ima*, *T'at'aliyapa*) 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 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'aliyapa*). 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 Yakama Nation, Umatilla Tribes, Nez Perce Tribe, the Warm Springs 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 general 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 is one 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 44716 et 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 draft 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 at this time 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. Project construction and operation would result in significant adverse effects on historic properties.

Effects on Access to Usual and Accustomed Gathering Sites

During scoping, the Yakama Nation 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 Nation 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 Nation 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 Nation state that its reserved right was observed by the State of Washington and the BPA for ongoing root and plant gathering access by Yakama members in a PA between BPA and the Washington SHPO.⁸⁰ The Yakama Nation 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.

In comments on the draft EIS, multiple parties expressed a desire for the lands in the project boundary, including any fenced and excluded access areas, to be accessible for traditional purposes. In comments of the draft EIS, the Umatilla Tribe reiterate that "construction of the project will impede or interrupt traditions of harvesting and gathering the Tribes' "First Foods" and transmission of cultural information at the Project location." The Umatilla Tribe add that the construction of the project "will sever that link which connects the traditions of the past to the present Tribal members."

Our Analysis

The proposed project would not be located on land that is directly adjacent to the Columbia River. The *Pushpum* and *Nch'ima* areas are important to the Yakama Nation and other Tribes for a variety of culturally important purposes. Project construction would permanently remove 193.6 acres of land and disturb an 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

⁸⁰ The PA to which the Yakama refers was executed in 1997 among 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.

possible and including culturally important plants in the revegetation mix in consultation with the Tribes 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 is to be constructed are owned by NSC Smelter. NSC Smelter also is the landowner of a large part of the site leased to the 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.”⁸¹ 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 (all project facilities would be fenced for safety and security purposes), the Commission does not have the legal authority to place requirements on owners of private property for 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 Nation 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 Nation 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.

Project construction and operation could result in adverse effects on Tribal access to lands historically used for traditional purposes. Because the land in question is privately owned, it is not clear whether Tribal member access is currently allowed. To the extent there is permitted access, it is likely through informal agreements as there have been no formal agreements filed with the Commission.

⁸¹ Letter from NSC Smelter filed July 7, 2022.

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. 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 right-of-way for the Rock Creek–John Day No. 1 transmission line and then 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 September 30, 2021 and October 29, 2021, and (both filed by FFP on January 25, 2022) respectively, the Washington SHPO and Oregon 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 installation of John Day Lock and Dam, CGA smelter, Klickitat PUD's pumping station, nearby wind farms, and other associated infrastructure have modified the natural landscape of the Columbia Hills area. 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 in Appendix B).

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 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 persons per owner-occupied household 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 in Appendix B).

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 (Appendix B) 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 REA Notice, Klickitat County expressed concerns with elevated construction traffic on county roads. Klickitat County recommends that FFP evaluate the adequacy of any county roads and bridges that would be used as haul routes during project construction and that the analysis follow the county's Geotechnical Guidelines and report 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 comments, 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 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 to the project location is the City of Goldendale, Washington (19 miles north). 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 (Appendix B).

During the peak of the 5-year construction period, FFP estimates that it would employ about 800 construction workers. They are expected to reside in local residences, rentals, recreation vehicle (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 using the IMPLAN Economic Impact Analysis for Planning model, which analyzed and quantified direct, indirect, and induced impacts from the project. 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 million 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 toward 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 may be required to accommodate construction equipment.

State Road 14 is a major east–west state route that runs along the north side of the Columbia River. State Road 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 State Road 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 TWPA 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 Highway 97. Goldendale School District No. 404 buses use various roads throughout the county, including State Road 14 and Hoctor Road (Washington DOE, 2022a).

FFP states that portions of the private access roads leading 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. State Road 14, Hoctor Road, and other roads could also be subject to detours and additional traffic due to construction of the proposed project. In its proposed Wildlife Management Plan, FFP commits to limiting construction to the period of 8 a.m. to 6 p.m., 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 State Road 14 is about 1,200 vehicles (Washington DOE, 2022a), thus construction traffic as discussed below could result in noticeable delays to the movement of people and goods along State Road 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 (2022a) 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 multiple 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 on-site 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).⁸²

Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*,⁸³ also directs agencies to develop “programs, policies, and activities to address the disproportionately high and

⁸² 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.

⁸³ 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. See EPA, EJ 2020 Glossary (Jul. 31, 2023), <https://www.epa.gov/environmentaljustice/ej-2020-glossary>.

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.”⁸⁴

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, 2021a). 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 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, 2021a).

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.”⁸⁵

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

⁸⁴ 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.](https://www.epa.gov/environmentaljustice/learn-about-environmental-justice#:~:text=Environmental%20justice%20(EJ)%20is%20the,environmental%20laws%2C%20regulations%20and%20policies.)

⁸⁵ Exec. Order No. 13985, 86 Fed. Reg. 7009 (Jan. 20, 2021).

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 elibrary 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 Native American 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 and October 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; Native American Tribes; potentially affected landowners; local newspapers; and other stakeholders who had indicated an interest in the project.

3.3.10.2 Affected Environment

Consistent with CEQ⁸⁶ and EPA⁸⁷ 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.⁸⁸

⁸⁶ 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.

⁸⁷ 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.

⁸⁸ Here, we selected "county" as the comparable reference community to ensure that affected environmental justice communities are properly identified.

To identify potential environmental justice communities for the analysis presented in the draft EIS, Commission staff used 2020 U.S. Census American Community Survey data for the race, ethnicity, and poverty data at the block group level. For the final EIS, staff used 2022 U.S. Census American Community Survey data,⁸⁹ and revised the analysis accordingly.⁹⁰ 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 populations and whether those impacts were significant.⁹¹ 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*.⁹²

The environmental justice analysis for the Goldendale project spans three different counties: Klickitat County in Washington (six 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

⁸⁹ U.S. Census Bureau, American Community Survey 2018-2022 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>.

⁹⁰ Census Tract 9501.03, Block Group 1 in Klickitat County and Census Tract 9601, Block Group 1 in Gilliam County are no longer identified as environmental justice block groups within the project boundary due to the updated census data.

⁹¹ 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”).

⁹² *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. 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 five 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 2; Census Tract 9502, Block Group 1; and Census Tract 9501, Block Group 2 (*see* Figure 3.3.12-1 in Appendix A). Of the five identified environmental justice communities, three meet the criteria for households in poverty (Census Tract 9501.02, Block Group 2; Census Tract 9501.03, Block Group 2; and Census Tract 9502, Block Group 1 in Klickitat County), while two of these communities meet the criteria threshold for minority populations (Census Tract 9501.01, Block Group 1 in Klickitat County and Census Tract 9501, Block Group 2 in Sherman County) (*see* tables 3.3.10-1 and 3.3.10-2 in Appendix B).

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* section 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 project on environmental justice communities in response to the Commission's REA Notice. During scoping, the Environmental Groups requested that the Commission examine impacts on environmental justice communities, and we do so below.⁹³

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). In its comments on the draft EIS, EPA asserts that the draft EIS EJ analysis underrepresents communities with EJ concerns because it fails to consider potential interrelated cultural, social, historical, or other factors that may amplify the effect of the proposed action on Tribal communities that want to use the lands for traditional purposes. To address EPA's concerns, we revised the analysis below to consider direct, indirect, and cumulative effects on Tribal use of the project area.

Our Analysis

Except for the transmission line, project-related construction, operation, and maintenance activities would not occur in any environmental justice communities. Construction of the project transmission line would occur within BPA's right-of-way within environmental justice community Census Tract 9501, Block Group 2 in Sherman County, Oregon. There is one town within this environmental justice community that is close (a quarter of a mile) to the proposed transmission line: Rufus, Oregon, located along the Columbia River Highway.

⁹³ *See* Environmental Groups' comment letter filed December 28, 2020.

Air Quality

Construction of the project would result in temporary emissions of criteria pollutants. These emissions generally include fugitive dust [(particulate matter (PM)₁₀ and PM_{2.5}] 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 nitrous oxide and carbon monoxide. 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 area⁹⁴ and because EJScreen indicates the incidence of adult asthma in this location at the tract level is relatively high (with 4 of the 5 environmental justice communities reporting in the 80th–90th percentile).

Construction-related emissions at the project would occur over the 5-year construction period and would dissipate with distance from areas of active construction, therefore likely only temporarily impacting one of the five identified environmental justice communities, Census Tract 9501, Block Group 2, that is close to the proposed transmission line. Emissions would be the greatest during the first 3 years of construction when land clearing activities are occurring. Further, construction emissions would subside once construction is complete. Implementing dust control measures as proposed by FFP and recommended by EPA such as applying dust palliatives to disturbed areas; cleaning and 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; developing a robust surface/roadway watering plan and monitoring and response plan; speed limits to limit dust entrainment; and identifying a threshold high windspeed to stop material movement and processing to prevent significant dust emission events would minimize the amount of dust emitted within environmental justice communities. Therefore, because construction emissions would be temporary and 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 residences within an environmental justice community are in Rufus, Oregon, which is located across the Columbia River from the project site and about 0.25-mile from the proposed transmission line. 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. FFP's

⁹⁴ Medically underserved areas/populations are areas or populations designated by U.S. 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: <https://bhwh.hrsa.gov/workforce-shortage-areas/shortage-designation#mups>. Accessed February 2, 2024.

proposal to limit construction to the hours of 8 a.m. to 6 p.m. 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 3.3.12, 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, noise impacts 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 and the project transmission line. 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. Therefore, visual impacts on environmental justice communities would be less than significant.

Tribal Use of Lands

Of the five identified environmental justice communities, two of them meet the criteria for "minority population" and only one of these two communities is reported to contain American Indians/Alaska Natives (0.4%) (Census Tract 9501, Block Group 2 in Sherman County).⁹⁵ The identified environmental justice community with an American Indian/Alaska Natives population is located south of the Columbia River adjacent to the proposed transmission line. While the identified environmental justice communities do not have a large American Indian/Alaska Natives population, the area has important historical value to the members of the Yakama Nation, Umatilla Tribes, Warm Springs Tribes, and Nez Perce Tribes for traditional

⁹⁵ Any Tribal affiliation of the American Indian/Alaska Natives population (0.4%) in the identified environmental justice community is unknown.

purposes such as food gathering and ceremonies, as discussed in section 3.3.8 *Cultural Resources*.

As described previously, 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. The construction of the Goldendale project facilities would contribute to those effects by removing 92.36 acres that could be used by the Tribes if they have access, however, the lands that would be removed and majority of project-related construction, operation, and maintenance activities do not occur within an identified environmental justice community.⁹⁶ As noted previously, while the Commission could require that FFP allow Tribal access to project lands for traditional purposes where it is safe to do so (all project facilities would be fenced for safety and security purposes), the Commission does not have the legal authority to place requirements on owners of private property for 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 Nation and other Tribes because of the presence of the project facilities. While there would be 92.36 acres less land within the *Pushpum* TCP 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 Nation and other Tribal members would still need to work with adjoining private landowners to gain access.

Determination of Disproportionately High and Adverse Impacts on Environmental Justice Communities

In consideration of the included census data, and analysis provided in this final EIS, the project would have a range of impacts on the environment and individuals living in the vicinity of the project, including environmental justice communities. Impacts associated with construction and operation of the project related to air quality, noise, and visual resources would not be disproportionate and adverse on environmental justice communities, as these impacts would not be predominantly borne by an environmental justice community. Construction impacts associated with the resources addressed in this final EIS would be limited to the 5-year construction period and operational impacts associated with anticipated visual impacts would be permanent. All air quality, noise, and visual impacts on environmental justice communities would be appropriately mitigated (*see* sections 5.1.1 and 5.1.2 and Appendix G) and would be less than significant.

⁹⁶ As previously discussed, project-related construction, operation, and maintenance activities would not occur in any environmental justice communities except for the transmission line within Census Tract 9501, Block Group 2 in Sherman County, Oregon.

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 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, 2020): (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 nonattainment for a pollutant and NAAQS are considered attainment areas.

Section 176(c) of the Clean Air Act 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 as “Attainment” or “Unclassifiable” for all criteria pollutants (EPA, 2021b) 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 the agency 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 (CO₂), methane (CH₄), nitrous oxides (NO_x), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Of these, CO₂, CH₄, and NO_x 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) 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 site and one at the lower reservoir site. 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 is 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.

In comments on the draft EIS, EPA recommends that the fugitive dust control component of the erosion control plan include: (1) a robust surface/roadway watering plan, possibly including chemical dust control and/or gravel roadway cover if necessary; (2) a robust monitoring and response plan to identify and address periods of significant dust emission; (3) consideration of weather conditions including a threshold high windspeed for stopping material movement and processing to prevent significant dust emission events; (4) roadway speed limits to limit dust entrainment; (5) haul truck cleaning and load covering requirements; (6) identification of responsible officials and training procedures; (7) record keeping and reporting schedules; and (8) community/citizen reporting forms/phone-line and contact information to report dust impact events.

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 (EPA,

1995), C.F.R. 40.98, or manufacturer supplied information (Trinity, 2022). Average emissions from combustion during construction is estimated to be 1.56-ton sulfur dioxide (SO₂), 176.72-ton carbon monoxide (CO), 216.92-ton NO_x, 8.83-ton PM₁₀, 8.83-ton PM_{2.5}, and 11.81-ton volatile organic compounds (VOCs). The total emissions from combustion and the concrete batch plants during construction are estimated to be 1.56-ton SO₂, 176.72-ton CO, 216.92-ton NO_x, 1,086.20-ton PM₁₀, 118.17-ton PM_{2.5}, and 11.81-ton VOCs (table 3.3.11-3 in Appendix B). Table 3.3.11-3 shows the total estimated actual construction phase criteria pollutant and GHG emissions. These emission rates are in average tons per year of emissions, calculated by estimating the total emissions across the entire construction phase and dividing by the 5-year construction time span. Emissions are presented in an average tons per year basis to match the basis of the criteria pollutant and GHG impact indicators.

Land-disturbing activities make up the largest part of the average yearly estimated fugitive dust emissions: 1,075.59-ton PM₁₀, 107.59-ton PM_{2.5}. Applying dust palliatives to limit air borne particles as proposed by FFP would minimize fugitive dust emissions. The additional details recommended by EPA would make FFP's proposed erosion and sediment control plan more robust and improve monitoring and reporting requirements thereby minimizing the potential release of fugitive dust.

The General Conformity Rule is codified in 40 C.F.R. 93, Subpart B and was developed to ensure that federal actions in nonattainment and maintenance areas do not impede states' attainment of the 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 minimis thresholds: NO_x (100 tons/yr), CO (100 tons/yr), PM₁₀ 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 Prevention of Significant Deterioration 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 Prevention of Significant Deterioration /Title V programs. This suggests that construction phase criteria pollutant impacts would not likely 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 CO, NO_x, and PM₁₀/PM_{2.5}. Estimated emissions do not exceed EPA's General Conformity de minimis thresholds.

Greenhouse Gases

Emissions of GHGs are quantified in units of carbon dioxide equivalents (CO₂e). The CO₂e unit of measure considers the global warming potential (GWP) of each GHG over a

specified timeframe. The GWP is a ratio relative to CO₂ that is based on the GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. Thus, CO₂ has a GWP of 1, CH₄ has a GWP of 25, and NO_x has a GWP of 298 on a 100-year timescale. To quantify the CO₂e, the mass of the compound is multiplied by the corresponding GWP, the product of which is the CO₂e for that compound. The CO₂e value for each of the GHG compounds is summed to obtain the total CO₂e GHG emissions.

The project construction phase would produce GHG emissions from fuel combustion and would result in approximately 96,913.70 metric tons of CO₂e over the five-year construction period, or approximately 19,382.74 metric tons of CO₂e annually.

In the draft EIS, we assumed that a proportion of the energy used to pump water to the upper reservoir would come from energy generated from fossil fuels based on the current energy mix available in the state of Washington. However, upon further analysis, we now believe that assumption was wrong. FFP intends to pump water to the upper reservoir when there is surplus energy available from renewable energy sources and generate when the grid is experiencing shortfalls. Therefore, there would be no production of GHG during the pumping cycle. Operation and project maintenance activities would result in insignificant emissions of GHGs from the occasional combustion of fuels in project trucks and small on-site generators.

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 United States into 10 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 midcentury, 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. Global Change Research Program Climate Science Special 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.

Washington DOE in its final EIS for the Goldendale Project (Washington DOE, 2022a) summarized trends occurring in the Columbia Basin based on recent regional climate change studies for air temperature, annual and seasonal precipitation and streamflow, water temperature, and wildfire. Washington DOE's information is incorporated by reference and summarized here. Average annual daily maximum temperatures have warmed in the Columbia River Basin by about 1.5°F since the 1970s and are projected to continue increasing into the 2030s. The Columbia River Basin experiences large seasonal variability in precipitation each year, and this variability is projected to continue, with more precipitation during the winter months than the summer months. Warmer temperatures are likely to decrease snowpack over time, reducing spring and summer runoff. Snowpack is likely to decrease despite increases in overall annual precipitation, as a higher portion of precipitation would fall as rain instead of snow. Winter outflows from the Columbia River dams and fluctuations in water storage at the reservoirs could become more variable, and unregulated spring flow from snowmelt that passes through the dams in the vicinity of the proposed project is projected to occur earlier, with potential decreases in flow starting in June. Data showing water temperature trends in the Columbia River Basin show long-term warming water temperatures of approximately 0.5°F (0.3°C) per decade, primarily caused by increased air temperature. The past 40 years have seen an uptick in large forest fires and this trend is expected to continue with warming temperatures associated with climate change.

We do not expect that these trends will affect project operation or its resiliency because the small quantities of make-up water needed for operation (i.e., 360 acre-feet per year) should not affect the project's ability to operate and the project would not create a new appropriation of water from the Columbia River because make-up would be provided by Klickitat PUD via its existing water right. However, the project's withdrawals, albeit small relative to the flow in the Columbia River, could contribute to increased regional competition for water. Should environmental conditions change in the future because of climate change, the Commission's regulations and the requirements of any license would include measures that would ensure the project continues to maintain its structural integrity and safe operating conditions over the term of the license. Additionally, if there is a need to modify project operation or facilities to accommodate changes because of climate change or related factors during the term of any license issued, and reliable data became available to justify such modifications, the Commission's standard reopener article gives the Commission the ability to respond to the impacts of climate change, should license conditions need to be altered to respond to unforeseen environmental impacts.

As previously discussed, project construction would result in total GHG emissions of about 96,913.70 metric tons of CO₂e over the duration of construction (or 19,382.74 metric tons of CO₂e annually for five years). 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 CO₂e were emitted in 2020 (inclusive of CO₂e sources and sinks) (EPA, 2021b). Therefore, construction emissions from the project could potentially increase CO₂e emissions based on the national 2020 levels by about 0.00037% 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 CO₂e (inclusive of CO₂e sources and sinks).⁹⁷ Therefore, construction emissions would increase CO₂e emissions based on Washington 2020 levels by about 0.02% per year for 5 years.

To provide additional context, we estimate the social cost of GHGs associated with the reasonably foreseeable GHG emissions using the calculations described below. However, calculating the social cost of GHGs does not enable the Commission to determine whether the reasonably foreseeable GHG emissions associated with the project are significant or not significant in terms of their impact on global climate change.⁹⁸ In addition, there are no criteria to identify what monetized values are significant for NEPA purposes, and we are currently unable to identify any such appropriate criteria.⁹⁹ Because both the EPA and CEQ participate in the Interagency Working Group on Social Cost of Greenhouse Gases, Commission staff used the

⁹⁷ See EPA's Greenhouse Gas Inventory Data Explorer available at: <https://cfpub.epa.gov/ghgdata/inventoryexplorer/>.

⁹⁸ See *Mountain Valley Pipeline, LLC*, 161 FERC ¶ 61,043 at P296, (2017), *aff'd sub nom.*, *Appalachian Voices v. FERC*, 2019 WL 847199 (D.C. Cir. 2019); *Del. Riverkeeper v. FERC*, 45 F.th 104, 111 (D.C. Cir. 2022); *cont'd*.

⁹⁹ *Tenn. Gas Pipeline Co., L.L.C.*, 181 FERC ¶ 61,051 at P 37; see also *Mountain Valley Pipeline, LLC*, 161 FERC ¶ 61,043 at P 296, *order on reh'g*, 163 FERC ¶ 61,197, at PP 275-297 (2018), *aff'd*, *Appalachian Voices v. FERC*, No. 17-1271, 2019 WL 847199, at 2 (D.C. Cir. Feb. 19, 2019) (unpublished) (“[The Commission] gave several reasons why it believed petitioners’ preferred metric, the Social Cost of Carbon tool, is not an appropriate measure of project-level climate change impacts and their significance under NEPA or the Natural Gas Act. That is all that is required for NEPA purposes.”); *EarthReports*, 828 F.3d 949, 956 (D.C. Cir. 2016) (accepting the Commission’s explanation why the social cost of carbon tool would not be appropriate or informative for project-specific review, including because “there are no established criteria identifying the monetized values that are to be considered significant for NEPA purposes”); *Tenn. Gas Pipeline Co., L.L.C.*, 180 FERC ¶ 61,205, at P 75 (2022); See, e.g., *LA Storage, LLC*, 182 FERC ¶ 61,026, at P 14 (2023); *Columbia Gulf Transmission, LLC*, 180 FERC ¶ 61,206, at P 91 (2022); and *Driftwood Pipeline LLC*, 183 FERC ¶ 61,049, at P 61 (2023).

methods and values contained in the group's current draft guidance but note that different values will result from the use of other methods.¹⁰⁰

Accordingly, Commission staff calculated the social cost of carbon dioxide, nitrous oxide, and methane during construction. For the analysis, staff assumed discount rates of 5%, 3%, and 2.5%, that the project would begin service in 2030 and that the emissions would be at a constant rate for 30 years (consistent with the terms of our developmental analysis). Noting these assumptions, the emissions from GHGs during construction as disclosed in the EIS for the project are calculated to result in a total social cost of GHGs equal to \$1,296,588, \$4,577,699, and \$6,819,274 at each of the respective discount rates (all in 2020 dollars). Using the 95th percentile of the social cost of GHGs for the 3 percent discount rate, the total cost of GHGs from the Goldendale Project is calculated to be \$13,763,842 (in 2020 dollars).

Because GHG emissions would be limited to the construction period and the long-term 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, overall, 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 CGA 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-mile 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-mile 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-mile south of residential receptors in Rufus.

¹⁰⁰ *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990*, Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, February 2021 (IWG Interim Estimates Technical Support Document).

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 equivalent sound levels (Leq)¹⁰¹ at the receptors in the vicinity of the upper and lower reservoirs are 40 and 30 dBA,¹⁰² respectively, based on EPA (1974) (see table 3.3.11-1 in Appendix B).

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 decibels (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 and no entity has recommended any measures to minimize noise during project construction.

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

¹⁰¹ Equivalent sound level (Leq) is an average of the sound energy occurring over a specified period.

¹⁰² A-weighted decibel (dBA) is an expression of the relative loudness of sounds as perceived by the human ear.

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 in Appendix B 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 construction 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 Wildlife Management Plan, construction would be limited to the hours of 8 a.m. to 6 p.m. 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, thus, 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 would be located underground, noise levels from operation would 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.*,¹⁰³ 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

¹⁰³ 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,¹⁰⁴ non-spinning reserve, grid frequency regulation,¹⁰⁵ voltage support and regulation,¹⁰⁶ load following capability, peak shaving, and black-start capability.¹⁰⁷ 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.

¹⁰⁴ 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.

¹⁰⁵ 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.

¹⁰⁶ 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.

¹⁰⁷ 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, required by Washington DOE, 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 3.0, *Environmental Analysis*, and the costs discussed in section 4.0, *Developmental Analysis* and in appendices E and F, we conclude that the following environmental measures proposed by FFP would protect or enhance environmental resources and would be worth the cost. Therefore, we recommend including these measures in any license issued for the project.

Geology and Soils

- Develop a soil erosion and sediment control plan that includes 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.¹⁰⁸
- Implement a Draft Cleanup Action Plan for the WSI that includes methods and procedures for excavating and disposing of contaminated soils and liner materials during construction of the lower reservoir.

Aquatic Resources

- Initially fill the project reservoirs between September 1 and March 31 to prevent project-related flow reductions in the Columbia River that could delay salmon smolt migration.
- As part of the proposed Draft Cleanup Action Plan, decommission 10 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 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 includes 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 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 and Planting Plan filed on May 24, 2022, that includes: (1) evaluating the viability of establishing and rehabilitating a new stream course on-site at a

¹⁰⁸ 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.

minimum 1:1.1 ratio to mitigate for permanent impacts to the streams labeled 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; (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 on-site to reduce wildlife collisions.
- To mitigate for the permanent loss of wildlife habitat, work with FWS and Washington DFW to select and purchase 277 acres¹⁰⁹ 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 as part of the proposed Wildlife Management Plan: (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

¹⁰⁹ 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.

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 HPMP filed on January 25, 2022, 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 the footprints of aboveground features to the furthest extent reasonably practicable; (3) ensure facilities are free of debris and store unused or damaged equipment off-site 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 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 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, the conditions required by the WQC included in Appendix M,¹¹⁰ and staff’s recommended modifications and additional measures described below.¹¹¹ We

¹¹⁰ The WQC conditions require FFP to file finalized plans for Washington DOE’s approval (i.e. Dewatering Plan, Stormwater Pollution and Prevention Plan, Cleanup Action Plan for the West Surface Impoundment, Spill Prevention Plan, Water Quality Monitoring Plan, Wetland Mitigation and Planting Plan). These finalized plans would also need to be filed for Commission approval before construction could begin.

¹¹¹ If Klickitat PUD’s existing water pump station, infiltration gallery, conveyance pipe, and water supply vault are determined by the Commission to be licensed project works, then FFP could be required to enclose these facilities within the project boundary, file updated project

discuss the basis for our additional staff-recommended measures and the rationale for modifying FFP's proposal in Appendix G **Geology and Soils**

- Ensure that the soil erosion control plan to be developed contains construction measures and BMPs consistent with WQC conditions G.1, G.2, G.3, G.5, G.6, G.7, G.8, G.9, G.10, G.11, and G.16.¹¹²
- Include the following fugitive dust control measures in the soil erosion and sediment control plan: (1) a surface/roadway watering plan; (2) a monitoring and response plan to identify and address periods of significant dust emission; (3) a provision to identify a threshold high windspeed to stop material movement and processing to prevent significant dust emission events; (4) roadway speed limits to limit dust entrainment; (5) haul truck cleaning and load covering requirements; (6) identification of responsible officials and training procedures; (7) record keeping and reporting schedules; and (8) community/citizen reporting forms/phone-line and contact information to report dust impact events.

Terrestrial Resources

- Modify the Vegetation Management and Monitoring 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 (identified in consultation with the Tribes) 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) provisions to conduct pre-construction surveys for peregrine falcons and ferruginous hawks (in addition to surveying other raptor species already identified in the plan); (2) provisions to conduct pre-construction surveys for Dalles sideband snail, northwestern pond turtle, monarch butterfly and its preferred milkweed host plants, 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

boundary exhibits, and maintain these facilities for the term of any license issued. If a license is issued, a project boundary determination will be made in the license order.

¹¹² The WQC conditions require erosion and sediment control measures such as marking all clearing limits, stockpiles, staging areas, and trees to be preserved prior to construction and ensuring stock piles and staging areas are located a minimum of 25 feet from wetlands and surface waters; installing high visibility construction fencing around environmentally sensitive areas (such as wetlands, wetland buffers, riparian buffers, and mitigation areas); using seed mixes consisting of native, annual, and non-invasive plant species; disposing excavated sediment in approved upland disposal sites; re-introducing water into mitigation stream channels gradually at a rate not higher than the normal flow; not using hay or straw on exposed or disturbed soil at mitigation site(s), etc. See Appendix M for the list of the conditions.

project reservoirs to birds, bats, and other wildlife, criteria for deciding whether additional deterrents or modifications to the project are needed, and a schedule for filing monitoring reports with FWS, Washington DFW, Oregon DFW, Yakama Nation, Umatilla Tribes, Warm Springs Tribes, and Nez Perce Tribe; 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.

- If the monarch butterfly or its host plants are determined to be present based on the pre-construction surveys, develop a monarch butterfly management plan that includes measures to protect the butterfly's habitat, such as fencing off occupied areas or including milkweed in its revegetation seed mix.
- 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.

Threatened and Endangered Species

- Limit initial fill and periodic refill of the project reservoirs to between September 1 and March 31 to minimize project-related flow reductions in the Columbia River that could delay salmon smolt migration.

Recreation Resources

- Develop the visual resources and recreation management plan in consultation with the National Park Service and Tribes and include a provision in the 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 proposed HPMP to include specific treatment measures for all affected archaeological 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 specific 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; (3) surveying the archaeological sites using specially trained canines for historic and prehistoric human remains detection to minimize the potential for disturbing any undetected burial sites; and (4) 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 measures recommended 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 would incorporate BMPs into a soil erosion and sediment control plan that would minimize erosion and sedimentation. Fugitive dust and vehicle emissions would be emitted during project construction. The project is not in a nonattainment 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; cleaning and 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; developing a robust surface/roadway watering plan and monitoring and response plan; speed limits to limit dust entrainment; and identifying a threshold high windspeed to stop material movement and processing to prevent significant dust emission events 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. 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 and Monitoring Plan (as modified by the WQC conditions) 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 Nation, Umatilla Tribes, Warm Springs Tribes, and Nez Perce Tribe. 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 Nation 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, CGA 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 Nation and other 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'aliyapa*), which are all eligible for listing on the National Register. *Pushpum* has great traditional, cultural, and religious importance to the Yakama Nation and Umatilla Tribes. The Yakama Nation and Umatilla Tribes 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 TCPs. 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 associated TCPs. Revegetating disturbed lands with plants with cultural value to the Yakama Nation 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 to traditional plant gathering areas. Revising the HPMP to include these and other specific measures for archaeological sites and TCPs would also serve to partially mitigate 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, REA Notice, the following fish and wildlife agencies submitted recommendations for the project: Washington DFW filed 4 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. In the draft EIS issued on March 31, 2023, staff made a preliminary determination that 7 of the 12 recommendations were within the scope of 10(j) and 2 of the 12 recommendations could be within the scope of 10(j) in certain circumstances.¹¹³ Of the 9 recommendations staff considered to be within the scope of 10(j) or could be within the scope of 10(j), staff determined that 4 were inconsistent with the substantial evidence standard of section 313(b) of the FPA: (1) Washington DFW's recommendation that if Klickitat PUD's infiltration gallery in the intake pool fails and needs repair, the infiltration gallery should be made to conform to NMFS and Washington DFW fish screen criteria; (2) Interior's recommendation that FFP install and maintain fish screens on Klickitat PUD's infiltration gallery that meet NMFS and Washington DFW screening requirements including meeting or exceeding NMFS salmonid criteria for approach velocities and screen size; (3) NMFS's recommendation that FFP avoid placing permanent structures or impoundments in the Columbia River; and (4) NMFS's recommendation that FFP avoid underwater pile driving in the Columbia River anytime from March 1 through November 1 to protect juvenile and adult fish from high intensity noise produced by pile driving. Staff also found that NMFS's recommendation restricting the time period for receiving water from Klickitat PUD to initially fill and periodically refill the project reservoirs may be inconsistent with the comprehensive planning standard of section 10(a) and equal consideration provision of section 4(e) of the FPA.

On March 31, 2023, staff sent letters to Washington DFW, Interior, and NMFS noting the preliminary determinations of inconsistency. On April 19, 2023, NMFS requested a meeting to discuss their recommendations and attempt to resolve the inconsistencies. Neither Washington DFW nor Interior requested a meeting.

Staff conducted a section 10(j) meeting with NMFS on May 3, 2023. At the meeting, NMFS agreed to withdraw its recommendations concerning the placement of structures in the Columbia River and pile driving. However, no resolution was reached regarding NMFS' recommendation to restrict the timing to fill and refill the project reservoirs. A summary of the 10(j) meeting was filed on May 9, 2023.

On June 6, 2023, Washington DFW filed a letter commenting on the draft EIS but did not modify its 10(j) recommendations. On June 6, 2023, NMFS filed a letter modifying 2 of its 4 10(j) recommendations and rescinding the two concerning placing structures in the Columbia River and pile driving. On August 4, 2023, Interior filed a letter modifying 2 of its 4 10(j) recommendations and including 4 additional 10(j) recommendations, resulting in 8 total 10(j) recommendations.

¹¹³ Commission staff indicated in the draft EIS that two recommendations regarding screening Klickitat PUD's existing intake works would be within the scope of section 10(j) if the Commission determines that Klickitat PUD's existing intake structures (i.e., infiltration gallery, pump station, and conveyance pipe) are to be licensed project facilities.

Appendix H lists the revised recommendations filed pursuant to section 10(j), indicates whether the recommendations are included under the staff alternative, and includes the specifics of each recommendation's inconsistency and our determinations. 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 and in section 5.1, *Comprehensive Development and Recommended Alternative*, and in Appendix G.

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 in Appendix K.

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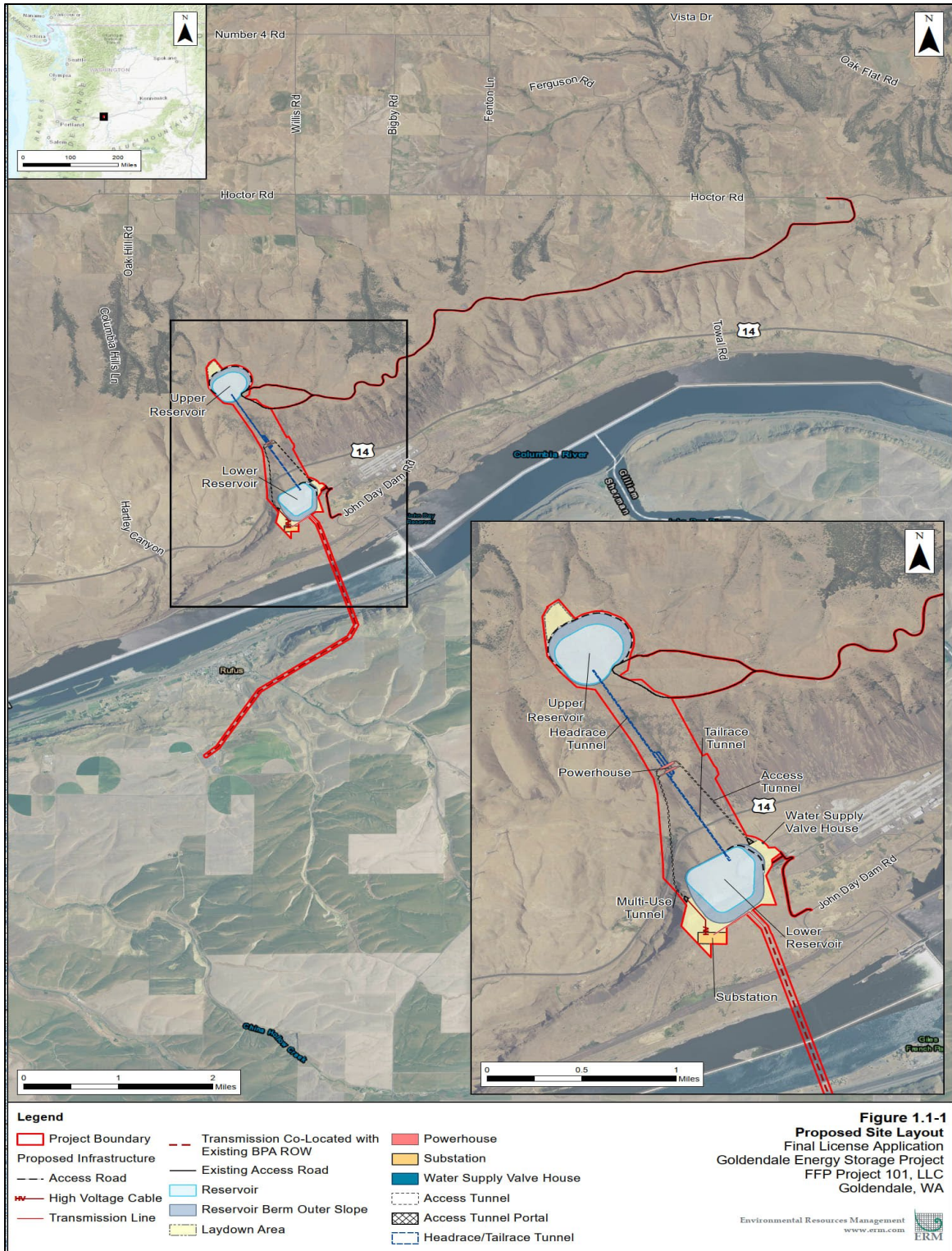


Figure 1.1-1. Location of Goldendale Energy Storage Hydroelectric Project (source: FFP, 2020, as modified by staff).

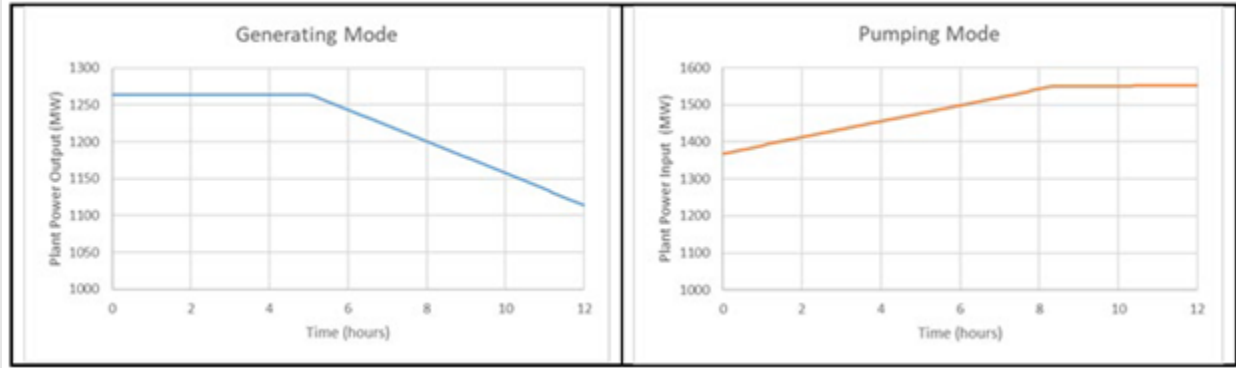


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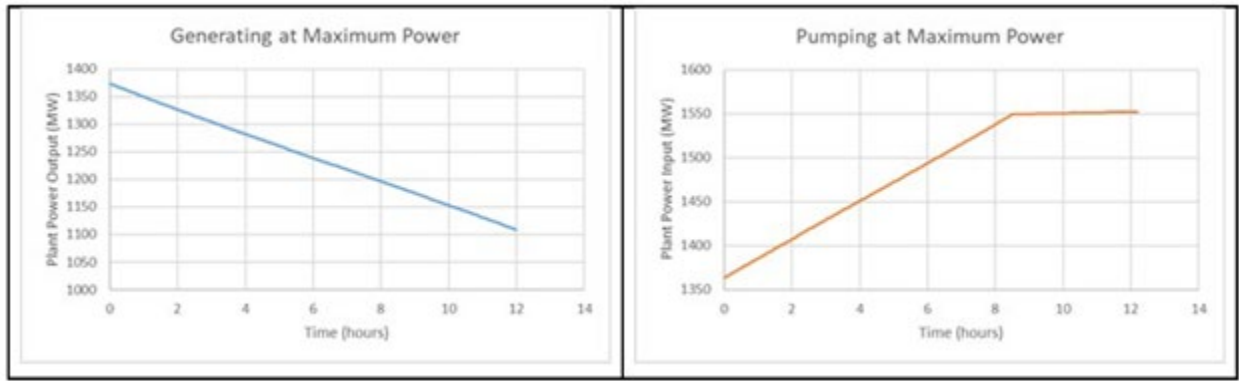


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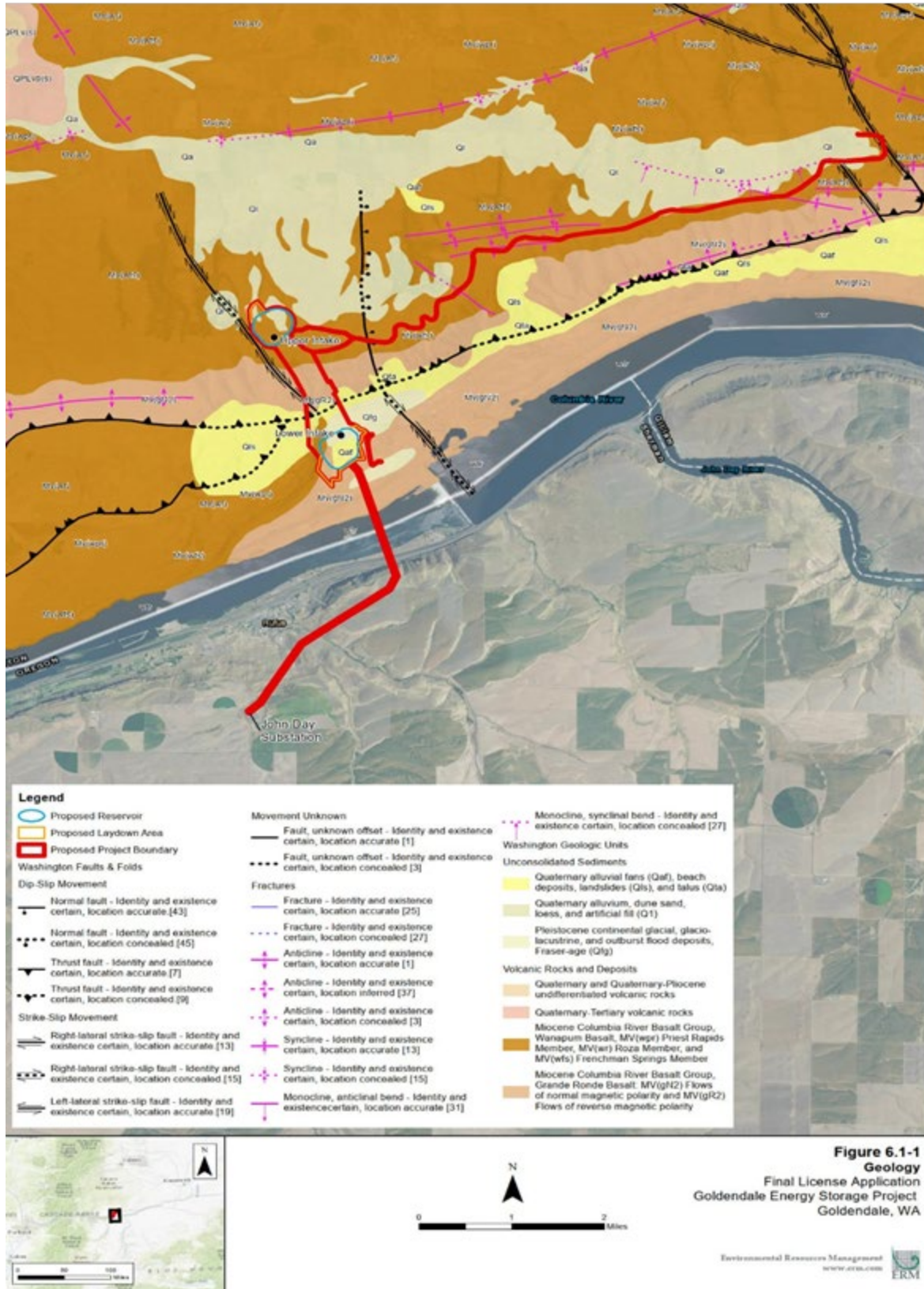


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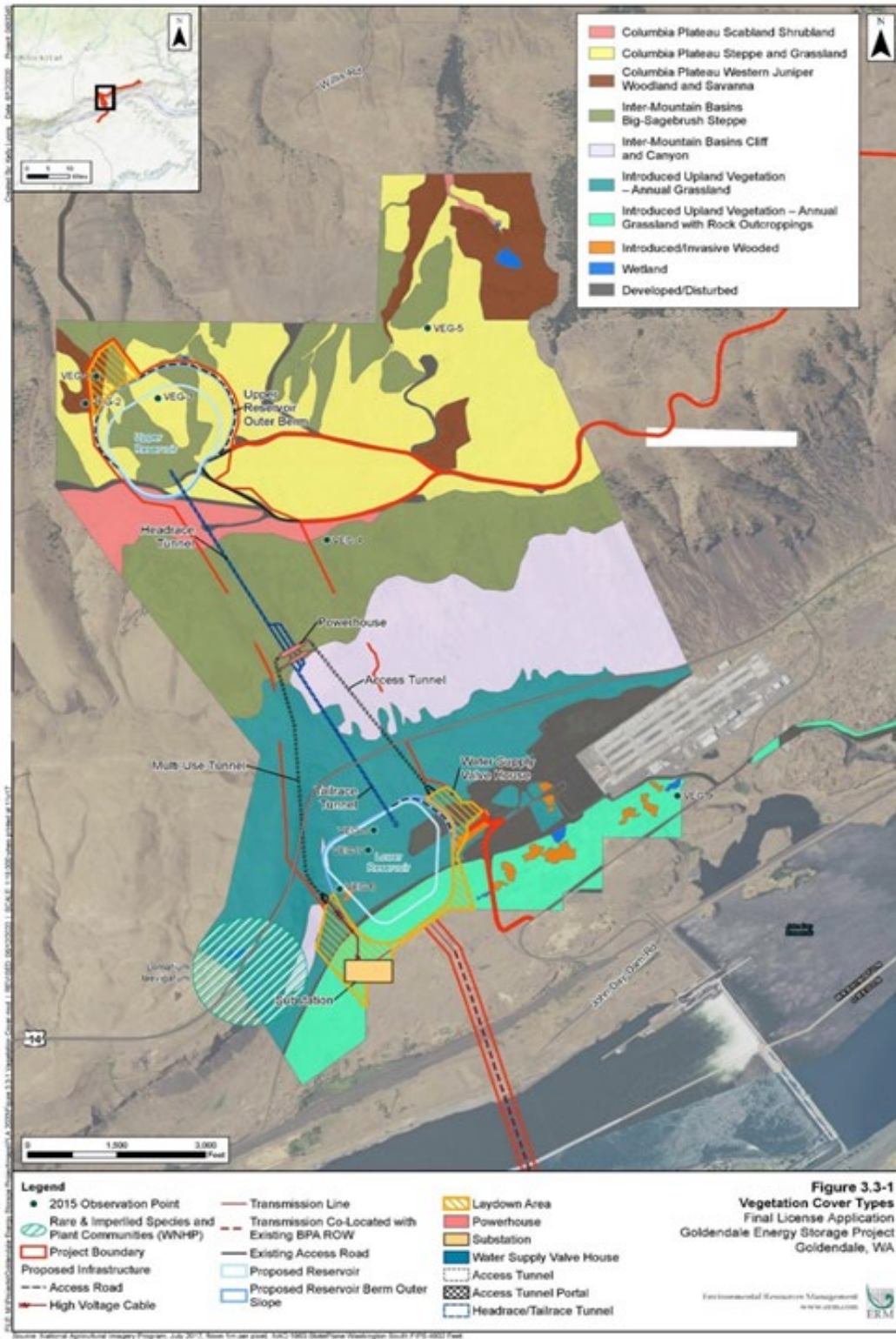
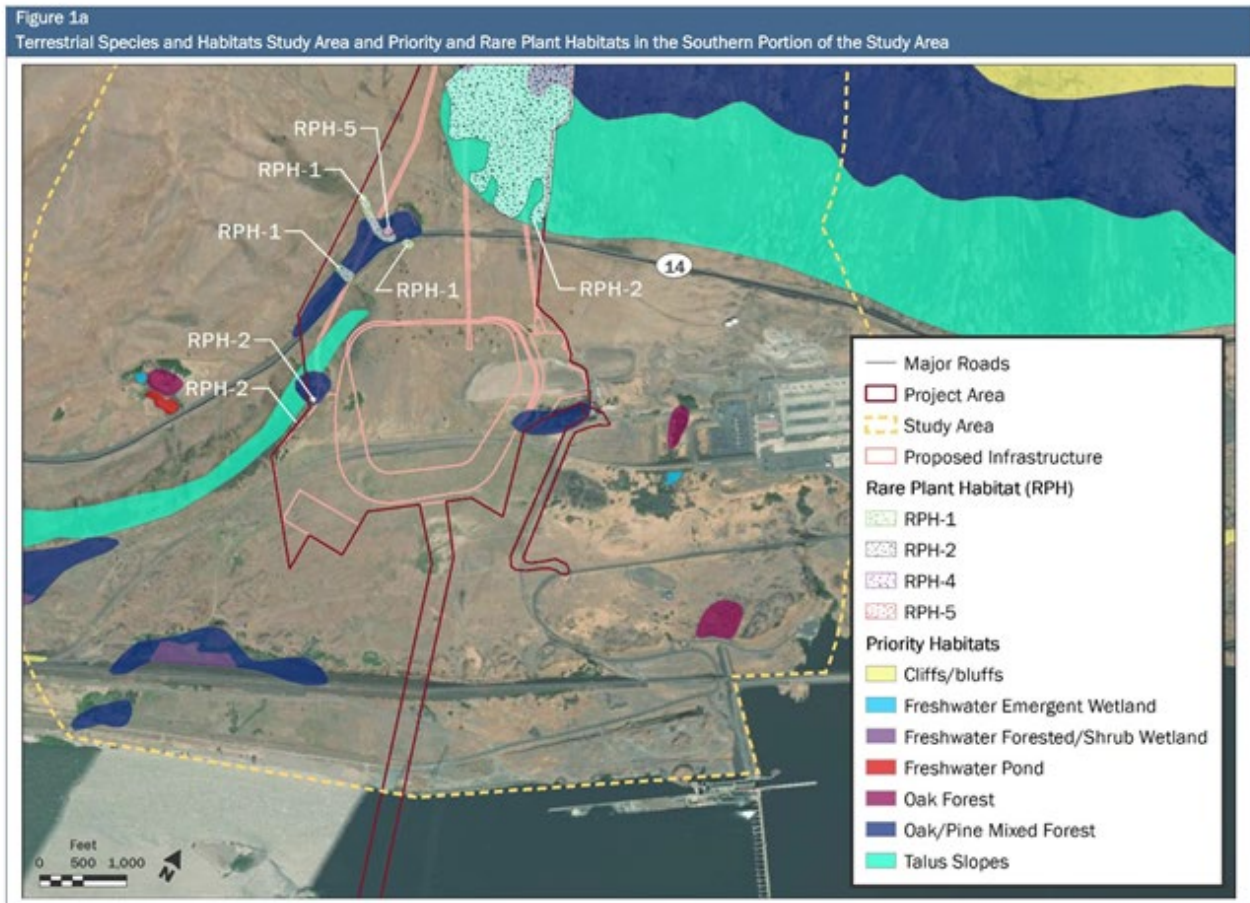


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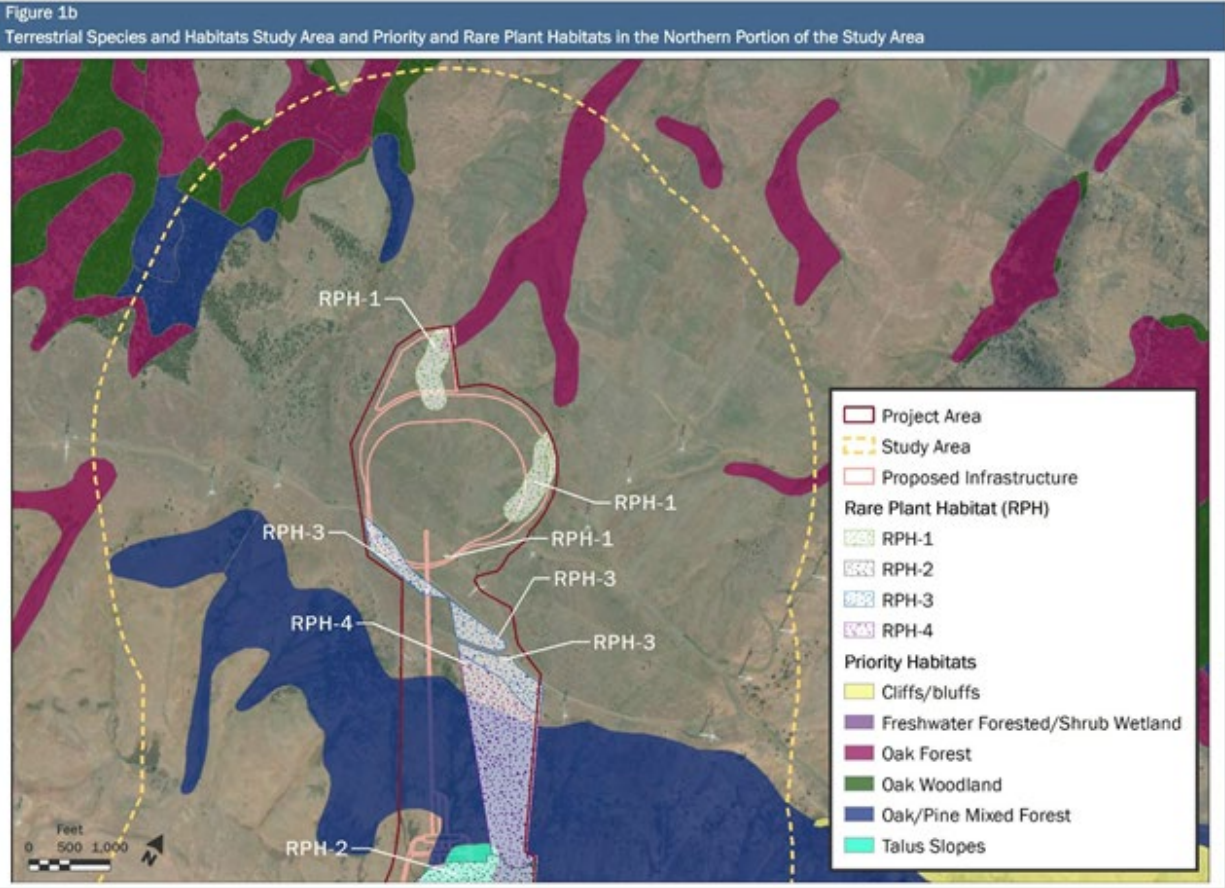


Sources: FFP 2021; WDFW 2021a

Note: Unmapped habitat classification areas are shown in Attachment 1. The Pacific Flyway and Columbia Hills Important Bird Area overlap with the entire study area.

Terrestrial Species and Habitats Resource Analysis Report
Proposed Goldendale Energy Storage Project

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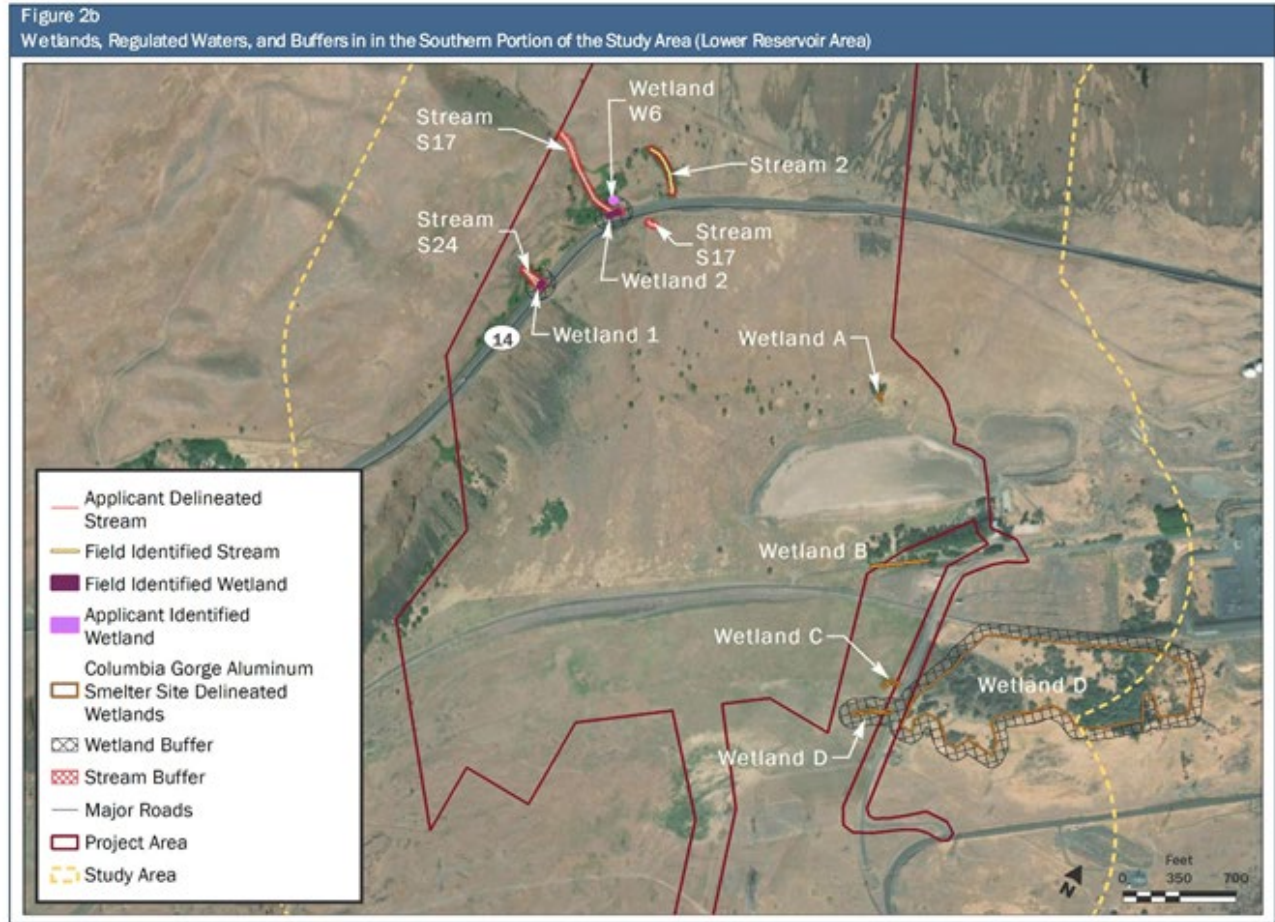


Sources: FFP 2021; WDFW 2021a

Note: Unmapped habitat classification areas are shown in Attachment 1. The Pacific Flyway and Columbia Hills Important Bird Area overlap with the entire study area.

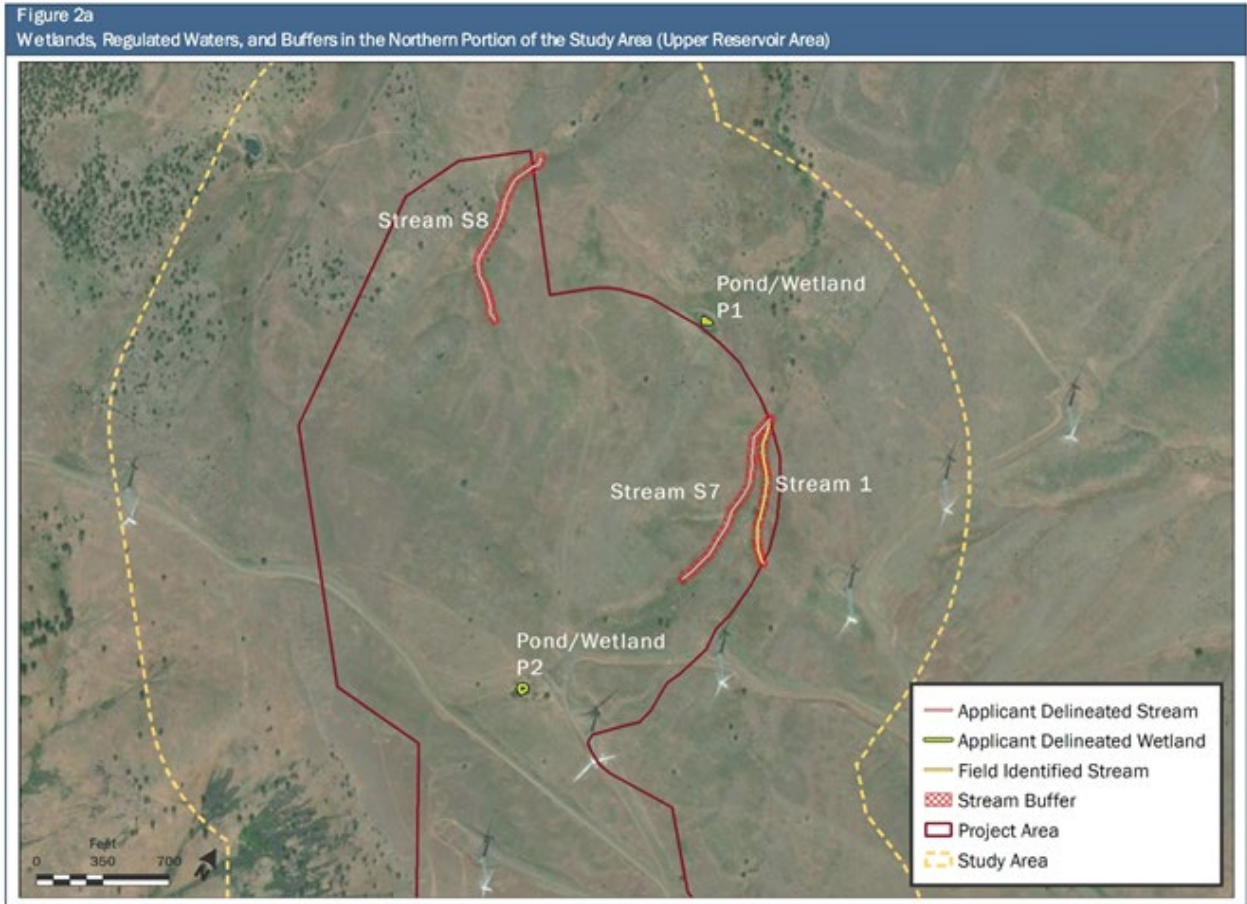
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Proposed Goldendale Energy Storage Project

Figure 3.3.4-2b. Priority habitat and rare plant habitat mapping in the northern/upper portion of the project area (source: Washington DOE, 2022a).



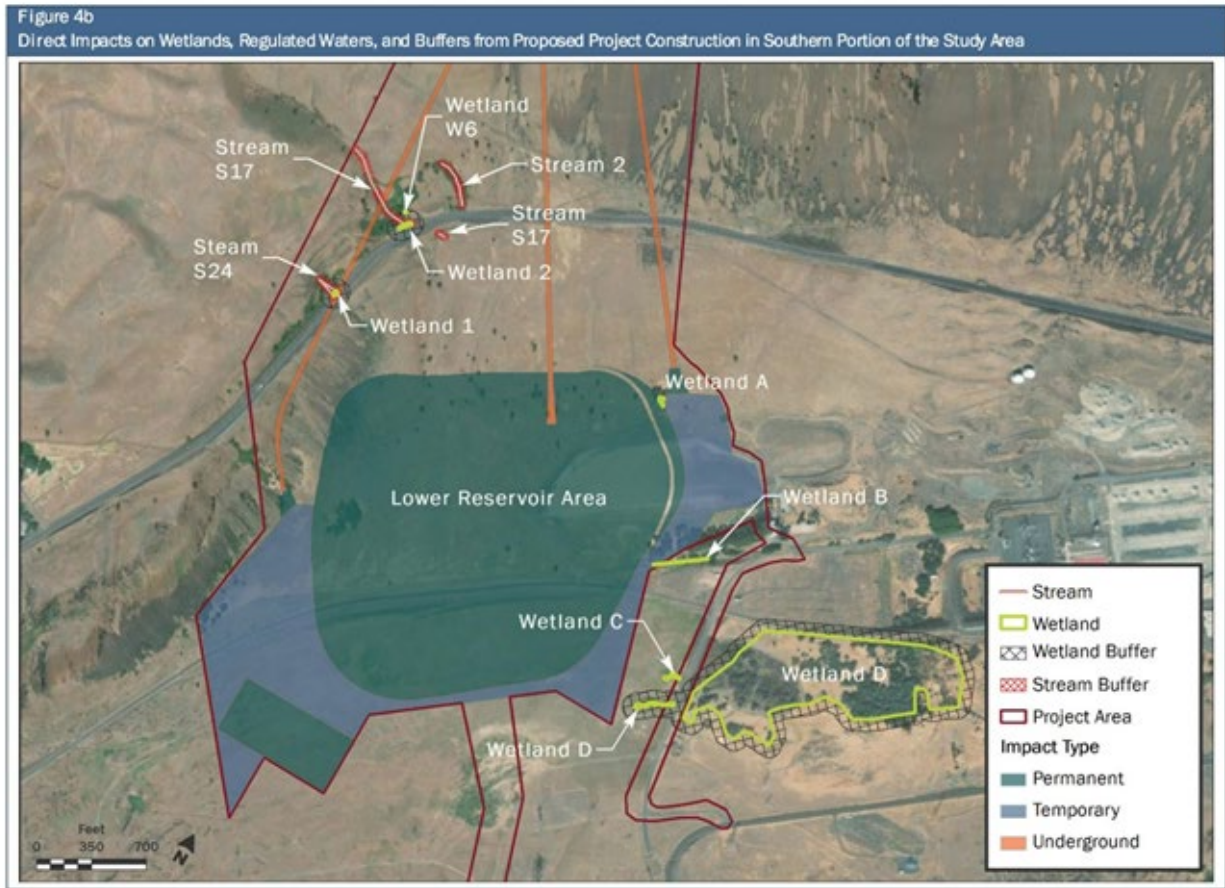
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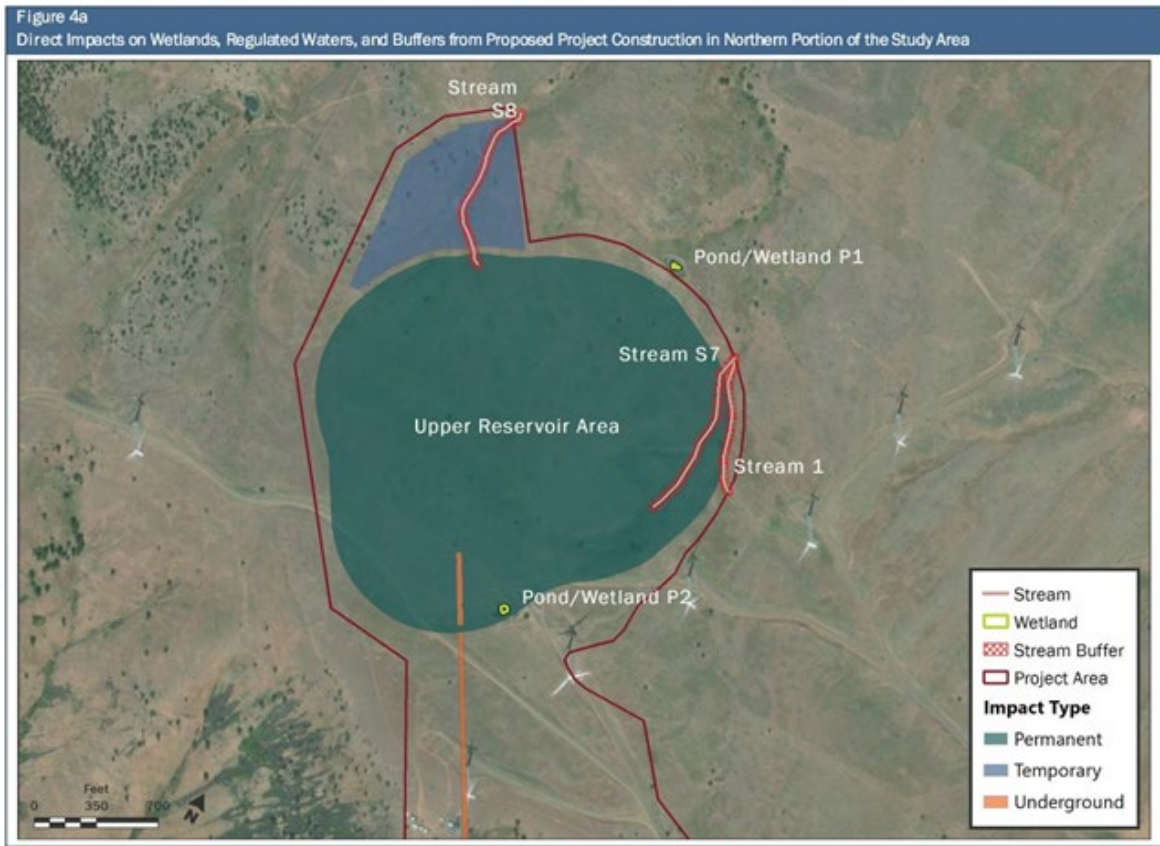
Source: FFP 2021; field knowledge gained through site visits performed by Anchor QEA and Ecology July 2021.

Figure 3.3.4-3b. Delineated wetlands and waterbodies in the northern/upper portion of the project area (source: Washington DOE, 2022a).



Sources: FFP 2021 ; PGG 2013; field knowledge gained through site visits performed by Anchor QEA and Ecology July 2021.

Figure 3.3.4-4a. Direct impacts of project construction on delineated wetlands and waterbodies in the southern/lower portion of the project area (source: Washington DOE, 2022a).



Sources: FFP 2021; field knowledge gained through site visits performed by Anchor QEA and Ecology July 2021

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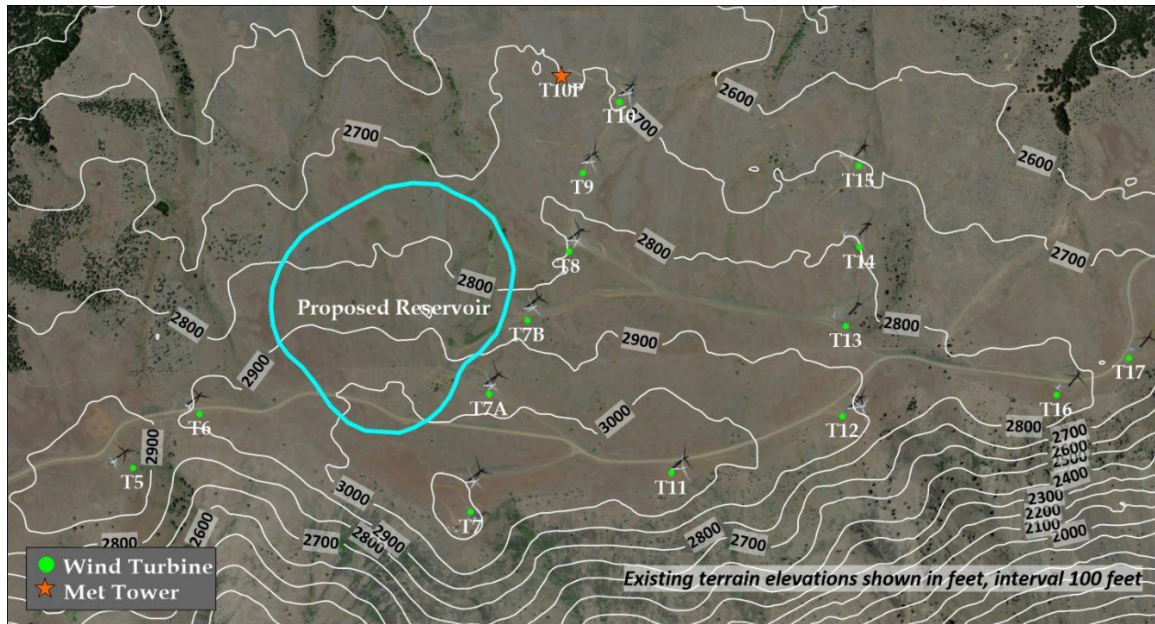


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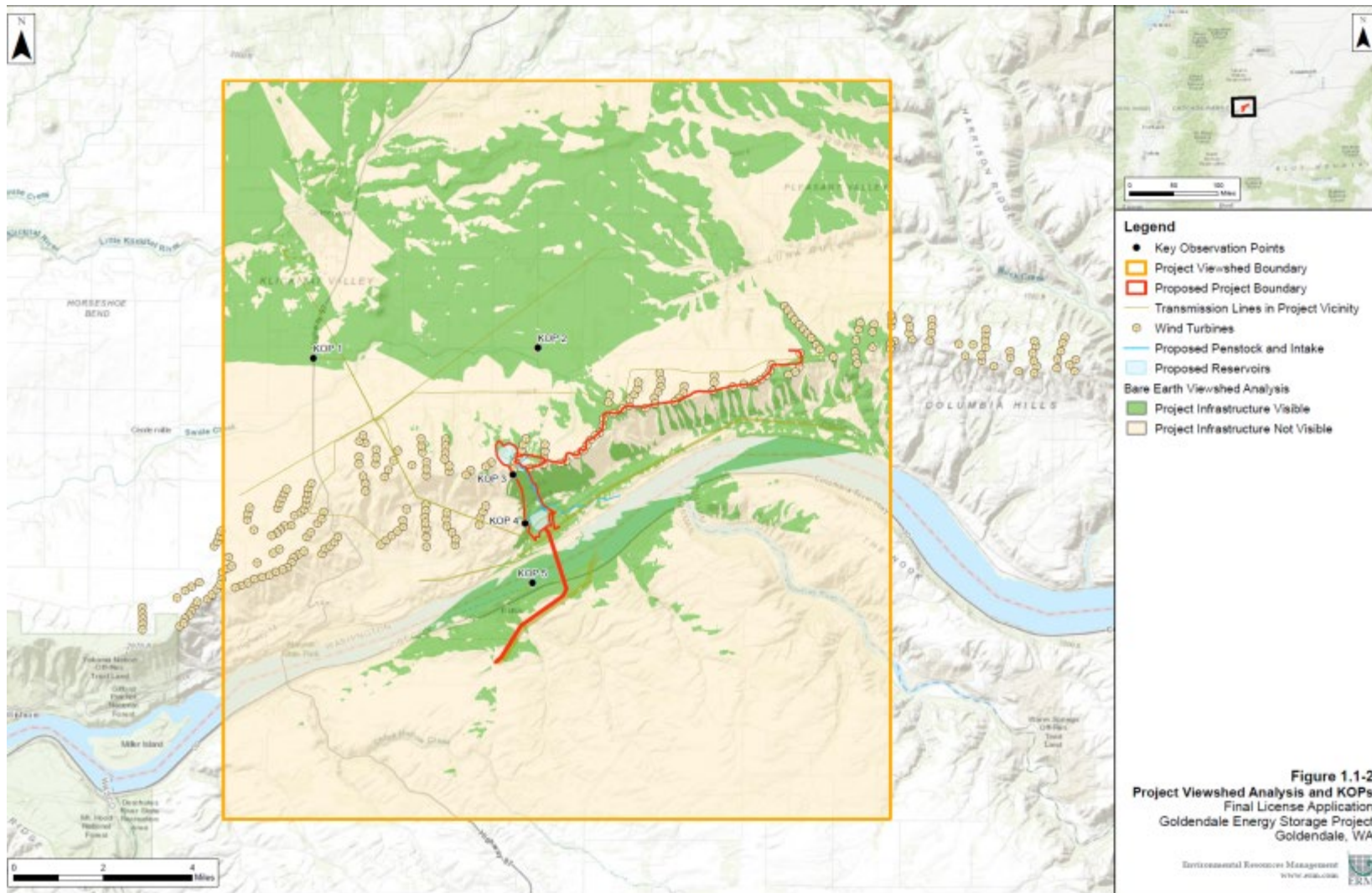


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Figure 3.3.7-8. Photo-simulation of the lower reservoir from the bank of the Columbia River in Giles French/John Day Dam Park as seen from KOP-5 (source: FFP, 2020).

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

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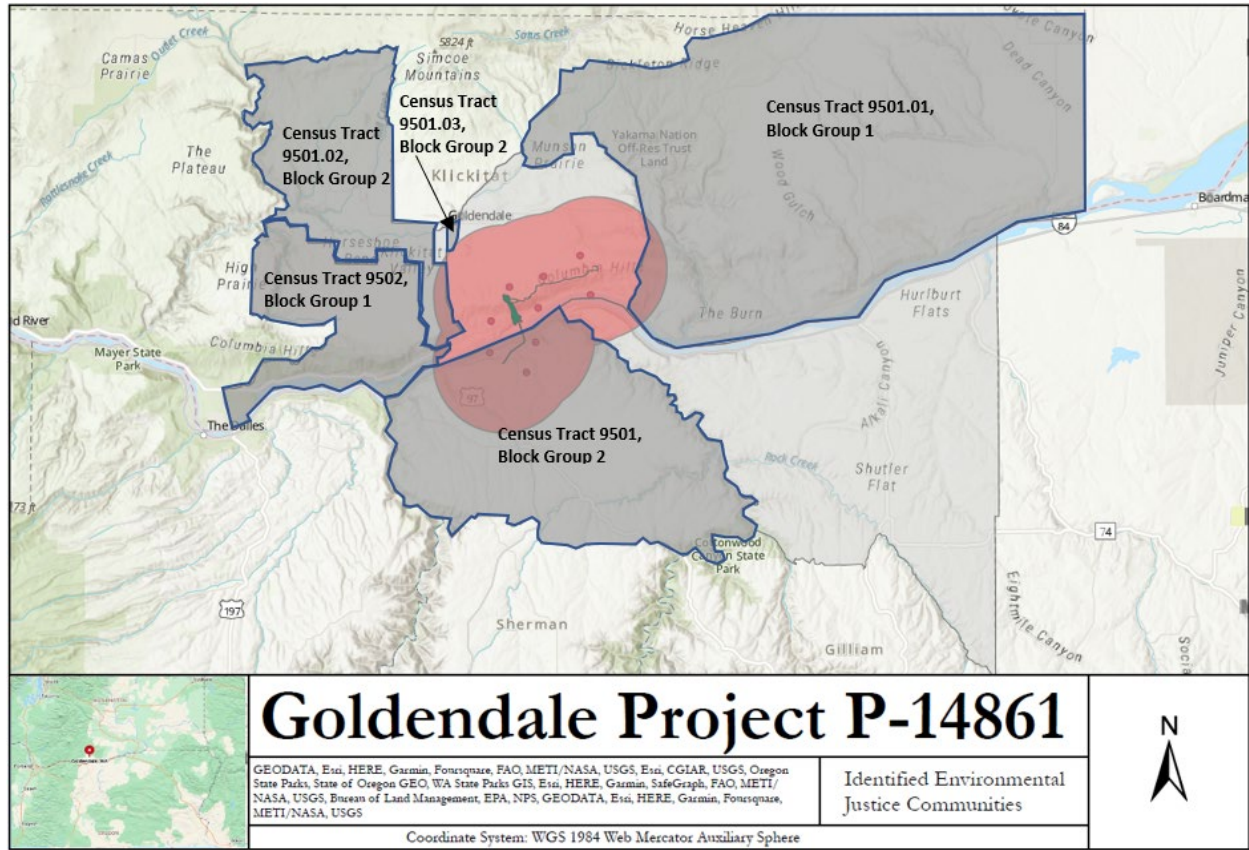


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Name of Primary Soils	Range of Water Erosion Factors		Wind Erodibility Group	Wind Erodibility Index
	Kw	Kf		
<i>Lower Reservoir Area</i>				
Ewall	0.10	0.10	2	134
Dallesport	0.02-0.28	0.02-0.43	3-7	38-56
Haploxerolls	0.15-0.32	0.32	3	86
Horseflat	0.10-0.20	0.37-0.43	6	48
<i>Upper Reservoir Area</i>				
Goldendale	0.37-0.43	0.37-0.43	5	56
Lorena	0.37-0.43	0.37-0.43	5	56
Rockly	0.10	0.37	8	0
<i>Slope between Reservoir Areas</i>				
Haploxerolls	0.15-0.32	0.32	3	88
Horseflat	0.10-0.20	0.37-0.43	6	48
Onyx	0.15-0.43	0.37-0.43	5	56
Rockly	0.10	0.37	8	0

Notes:

Water Erosion Factors: Kf = Fine fraction soil (grain size less than 2 millimeters) erosion rate of tons per acre per year; Kw = Whole soil erodibility

Range of Kw and Kf erosion potential factors: 0.02–0.15 = Low, 0.16–0.28 = Moderately Low, 0.29–0.43 = Moderate, 0.44–0.55 = Moderately High, 0.56–0.69 = High

Wind Erosion Factors: Wind Erosion Group is a dimensionless score ranging from 1 (highly erodible) to 8 (not erodible)

Wind Erodibility Group scoring: 1–2 = High, 3–4 = Moderately High, 5–6 = Moderately Low, 7–8 = Low

Wind Erodibility Index estimates susceptibility to wind erosion in tons per acre per year.

Wind Erodibility Index ranges: 0–62 = Low, 63–124 = Moderately Low, 125–186 = Moderate, 187–248 = Moderately High, 249–310 = High

Table 3.3.2-1. Monthly discharge metrics (thousand cfs) for the Columbia River at The Dalles, OR (1990–2019) (source: USGS, 2022).

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Annual
Mean	108	128	152	169	176	188	228	289	282	192	144	104	180
Median	105	124	146	163	160	173	222	271	262	179	140	100	160
Max	151	192	233	250	280	348	398	498	472	328	233	156	498
Min	72	89	96	107	105	104	114	155	143	107	89	67	67

Table 3.3.2-2. Washington DOE’s water quality standards required for surface waters of freshwater environments to support the aquatic life (salmon spawning, rearing, and migration) designated use (source: Washington State Legislature, 2022a).

Water quality parameter	Standard
Temperature	The 7-day average daily maximum (7-DADM) shall not exceed 17.5°C (63.5°F)
Dissolved Oxygen	The daily minimum shall not be less than 10 mg/L or 90% saturation.
Turbidity	Turbidity shall not exceed: <ul style="list-style-type: none"> • 5 Nephelometric Turbidity unit (NTU) over background when the background is 50 NTU or less; or • A 10% increase in turbidity when the background turbidity is more than 50 NTU.
Total Dissolved Gas	Total dissolved gas shall not exceed 110% saturation at any point of sample collection
pH	pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

Table 3.3.3-1. Minimum instantaneous flows specified by the Washington Administrative Code for the John Day Dam (source: Washington State Legislature, 2022b).

Period	Minimum Instantaneous Flow (1,000 cfs)
January	20
February	20
March	50
April 1-15	50
April 16-25	70
April 26-30	70
May	70
June 1-15	70
June 16-30	50
July 1-15	50
July 16-31	50
August	50
September	50
October 1-15	50
October 16-31	50
November	50
December	20

Table 3.3.3-2. Passage timing for years 2012 through 2021 of wild PIT-tagged juvenile and adult salmonids at the John Day Dam and The Dalles Dam (source: NMFS, 2022a; Columbia Basin Research, 2022a).

Associated Dam	Lifestage	Species	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	
John Day	Juvenile														
		Snake River Fall-run Chinook			■	■	■	■	■	■	■	■			
		Snake River Spring Summer-run Chinook				■	■	■	■	■	■				
		Snake River Sockeye					■	■							
		Snake River Steelhead				■	■	■	■	■					
		Upper Columbia River Spring-run Chinook				■	■	■	■	■					
		Upper Columbia River Steelhead				■	■	■							
		Middle Columbia River Steelhead			■	■	■	■	■						
The Dalles	Adult	Snake River Fall-run Chinook							■	■	■				
		Snake River Spring Summer-run Chinook				■	■	■	■	■	■				
		Snake River Sockeye						■	■						
		Snake River Steelhead		■	■	■	■	■	■	■	■	■	■	■	
		Upper Columbia River Spring-run Chinook				■	■	■	■	■					
		Upper Columbia River Steelhead					■	■	■	■	■	■	■		

Associated Dam	Lifestage	Species	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		Middle Columbia River Steelhead												

Note: Light gray shading indicates the full range of detections, while dark gray shading indicates the middle 90% of detection. Adult passage timing is provided for The Dalles Dam because it is the nearest location to the proposed project where specific 10-year historical run timing data are available.

Table 3.3.4-1. Special status plant species known to occur in Klickitat County (source: FFP, 2020).

Common Name	Scientific Name	Status
California's broomrape	<i>Orobanche californica</i> ssp. <i>grayana</i>	State-endangered
Hot-rock penstemon	<i>Penstemon deustus</i> var. <i>variabilis</i>	State-endangered
Obscure buttercup	<i>Ranunculus tritermatus</i>	State-endangered
Wormskiold's northern wormwood	<i>Artemisia campestris</i> var. <i>wormskioldii</i>	State-endangered
Inch-high rush	<i>Juncus uncialis</i>	State-threatened
Smooth desert parsley	<i>Lomatium laevigatum</i>	State-threatened
Bolander's linanthus	<i>Leptosiphon bolanderi</i>	State-sensitive
Common bluecup	<i>Githopsis specularioides</i>	State-sensitive
Douglas' draba	<i>Cusickiella douglasii</i>	State-sensitive
Few-flowered collinsia	<i>Collinsia sparsiflora</i> var. <i>bruceae</i>	State-sensitive
Nuttall's quillwort	<i>Isoetes nuttallii</i>	State-sensitive
Smooth goldfields	<i>Lasthenia glaberrima</i>	State-sensitive
Suksdorf's desert parsley	<i>Lomatium suksdorfii</i>	State-sensitive
Western ladies' tresses	<i>Spiranthes porrifolia</i>	State-sensitive

Note: Within 3 miles of the project area, Washington NHP has recorded two occurrences of smooth desert parsley. Smooth desert parsley is a state-threatened and Tribally important plant.

Table 3.3.4-2. Special status and culturally important plant species documented or with potential to occur in the project area (source: FFP, 2020 and Washington DOE, 2022a).

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Gray's broomrape	<i>Aphyllon californicum</i> <i>var. grayanum</i> or <i>Orobanche grayana</i> or <i>Orobanche californica</i> <i>ssp. grayana</i>	G4T3T4, S1	E	-	Peripheral; Vernal moist meadows and lower montane meadows, parasitic on sagebrush	Potentially present but not observed during botanical or cultural survey
Wormskiold's northern wormwood	<i>Artemisia campestris</i> <i>var. wormskioldii</i> or <i>Artemisia campestris</i> <i>ssp. borealis</i> <i>var. wormskioldii</i>	G5T1, S1	E	-	Regional Endemic; Arid shrub-steppe on basalt, usually flat terrain, floodplain of Columbia River	Potentially present but not observed during botanical or cultural survey
Few-flowered collinsia	<i>Collinsia sparsiflora</i> <i>var. sparsiflora</i> or <i>Collinsia sparsiflora</i> <i>var. bruceae</i>	G4T4, S1	S	-	Peripheral; Thin soils over basalt on almost flat to steep, generally south-facing slopes; moist in spring, but becoming dry by summer	Potentially present but not observed during botanical or cultural survey
Douglas' draba	<i>Cusickiella douglasii</i> or <i>Draba douglasii</i>	G4G5, S1	S	-	Peripheral; Windswept rocky ridges, granitic rock screes, loose volcanic hillsides, red barren hills, rocky flats, and serpentine ridges	Potentially present but not observed during botanical or cultural survey
Common bluecup	<i>Githopsis specularioides</i>	G5, S2S3	S	-	Sparse; Dry, open places at lower elevations, such as thin soils over bedrock outcrops, grassy balds, talus slopes, and gravelly prairies	Potentially present but not observed during botanical or cultural survey
Diffuse stickseed	<i>Hackelia diffusa</i> <i>var. diffusa</i>	G4T3, S2	T	-	Regional Endemic; Bottoms of mossy talus and scree slopes, shaded areas, cliffs, roadsides, and other disturbed sites	Potentially present but not observed during botanical or cultural survey

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Nuttall's quillwort	<i>Isoetes nuttallii</i>	G4?, S2	S	-	Sparse; Terrestrial in seasonally wet ground, seepages, temporary streams, and mud near vernal pools	Potentially present but not observed during botanical or cultural survey
Inch-high rush	<i>Juncus uncialis</i>	G3G4, S2	T	-	Sparse; Vernal pools and pond edges, often in channeled scablands, or biscuit-swale topography	Potentially present but not observed during botanical or cultural survey
Smooth goldfields	<i>Lasthenia glaberrima</i>	G5, S1	S	-	Peripheral; Margins of vernal pools, wet or muddy stream banks, wetlands, and winter-flooded meadows	Potentially present but not observed during botanical or cultural survey
Bolander's linanthus	<i>Leptosiphon bolanderi</i> or <i>Linanthus bakeri</i>	G4G5, S2	S	-	Peripheral; Dry, rocky places and open or partially vegetated slopes with scattered basalt rocks	Potentially present but not observed during botanical or cultural survey
Basalt biscuitroot (Smooth Desert Parsley)	<i>Lomatium laevigatum</i>	G3, S2S3	T	-	Local Endemic; Ledges and crevices of basalt cliffs along the Columbia River and adjacent rocky slopes of sagebrush steppe	Potentially present and observed during cultural survey but not overserved during botanical survey
Suksdorf's biscuitroot	<i>Lomatium suksdorfii</i>	G3, S3	S	-	Local Endemic; Semiopen to open, dry, rocky hillsides on moderate to steep slopes at elevation of 90 to 1100 meters (300-3,600 feet)	Potentially present but not observed during botanical or cultural survey
Hot-rock penstemon	<i>Penstemon deustus</i> var. <i>variabilis</i>	G5T2, S1	E	-	Regional Endemic; Dry foothills and lowlands, on open, dry, thin soils over basalt	Potentially present but not observed during botanical or cultural survey

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Obscure buttercup	<i>Ranunculus triternatus</i> or <i>Ranunculus glaberrimus</i> var. <i>reconditus</i> o <i>Ranunculus reconditus</i>	G5T2, S1S2	E	-	Local Endemic; Meadow steppe habitat dominated by bunchgrasses and forbs.	Potentially present but not observed during botanical or cultural survey
Western ladies-tresses	<i>Spiranthes porrifolia</i> or <i>Spiranthes romanzoffiana</i> var. <i>porrifolia</i>	G4, S2	S	-	Sparse; Wet meadows, bogs, streams, and seepage slopes. Elevation in Washington: 3-2,075 meters (10-6,800 feet)	Potentially present but not observed during botanical or cultural survey
Yarrow	<i>Achillea millefolium</i>	-	-	-	Grows in wet to dry soil in meadows, open places, in all elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Tapertip onion	<i>Allium acuminatum</i>	-	-	-	Grows in open, usually rocky places below 6,000 feet	Potentially present and observed during cultural survey but not observed during botanical survey
Barestem biscuitroot	<i>Lomatium nudicaule</i>	-	-	-	Grows in open areas with dry rocky clay or sandy soils from near coastline to mid elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Nine-leaf biscuitroot	<i>Lomatium triturnatum</i>	-	-	-	Grows on open or sagebrush slopes, ridges, pine woodlands in vernal-wet spots, often in serpentine areas	Potentially present and observed during cultural survey but not observed during botanical survey

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Pungent desert parsley	<i>Lomatium papilioniferum</i> (<i>L. grayi</i>)	-	-	-		Potentially present and observed during cultural survey but not observed during botanical survey
Biscuit root	<i>Lomatium macrocarpum</i>	-	-	-	Grows in rocky slopes, woodlands, at low elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Fernleaf biscuitroot	<i>Lomatium dissectum</i>	-	-	-	Grows in wooded or brushy slopes, talus and steep rocky slopes, at low to high elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	-	-	-	Grows in deep rich soils in ponderosa pine and sagebrush habitats, often in huge patches, at mid elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Black Hawthorne	<i>Crataegus</i> spp. (<i>C. suksdorfii</i> or <i>C. douglasii</i>)	-	-	-		Potentially present and observed during cultural survey but not observed during botanical survey
Smooth sumac	<i>Rhus glabra</i>	-	-	-	Grows in disturbed soils and grasslands near water in dry areas	Potentially present and observed during cultural survey but not observed during botanical survey

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Western juniper	<i>Juniperus occidentalis</i>	-	-	-	In Oregon and Washington found in elevations between 500 to 5,000 feet (150-1,500 meters) (OSU 2021)	Potentially present and observed during cultural survey but not observed during botanical survey
Ponderosa pine	<i>Pinus ponderosa</i>	-	-	-	In the Pacific Northwest it is most commonly found east of the Cascades, however in Oregon it is common in the western valleys of the Willamette, Umpqua, and Rogue Rivers (OSU 2021)	Potentially present and observed during cultural survey but not observed during botanical survey
Strict buckwheat	<i>Eriogonum strictum</i> <i>var. proliferum</i>	-	-	-	Grows in rocky places in shrublands, mountains, at low to high elevations (OSU 2021)	Potentially present and observed during cultural survey but not observed during botanical survey
Thyme-leaved buckwheat	<i>Eriogonum thymoides</i>	-	-	-	Grows in dry or rocky soils in sagebrush, on rocky ridges	Potentially present and observed during cultural survey but not observed during botanical survey
Arrowleaf buckwheat	<i>Eriogonum compositum</i>	-	-	-		Potentially present and observed during cultural survey but not observed during botanical survey
Columbia Gorge broad-leaf lupine	<i>Lupinus latifolius</i>	-	-	-	Grows in moist, open to shady woods and meadows	Potentially present and observed during cultural survey but not observed during botanical survey

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Rubber rabbitbrush	<i>Ericameria nauseosa</i>	-	-	-	Grows in dry soils in many habitats below 10,500 feet	Potentially present and observed during cultural survey but not observed during botanical survey
Chocolate lily	<i>Fritillaria camschatcensis</i>	-	-	-	Grows in wet soils that never dry in coastal areas and rain forest	Potentially present and observed during cultural survey but not observed during botanical survey
Nootka rose	<i>Rosa nutkana</i>	-	-	-	Grows in moist flats at low to mid elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Brodiaea	<i>Triteleia hyacinthina</i>	-	-	-	Grows in spring-wet grasslands from coast to mid-elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Wavyleaf thistle	<i>Cirsium undulatum</i>	-	-	-	East-Side Forest, Shrub-Steppe, Meadow, grows in open dry areas at low to mid elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Slender hawksbeard	<i>Crepis atribarba</i>	-	-	-	Grows in dry, grassy, open areas, pine forests in steppe	Potentially present and observed during cultural survey but not observed during botanical survey

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Northern mule-ears	<i>Wyethia amplexicaulis</i>	-	-	-		Potentially present and observed during cultural survey but not observed during botanical survey
Bitterroot	<i>Lewisia rediviva</i>	-	-	-	Grows in rocky soils in open places from just above sea level to alpine	Potentially present and observed during cultural survey but not observed during botanical survey
Common stork's-bill	<i>Erodium cicutarium</i>	-	-	-		Potentially present and observed during cultural survey but not observed during botanical survey
Miner's lettuce	<i>Claytonia perfoliata</i>	-	-	-	Grows in spring-damp, often shady places in the south, open to shady places in the north, often on disturbed soils, from sea level to mid-elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Spreading dogbane	<i>Apocynum androsaemifolium</i>	-	-	-	Grows in rocky places, dry open areas in conifer forests and adjacent shrub-steppe and prairies, at low to subalpine elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Silver puffs	<i>Uropappus lindleyi</i>	-	-	-	Grows in loose soils in meadows, woods, steppe or deserts, at low and mid elevations	Potentially present and observed during cultural survey but not observed during botanical survey

Common Name	Species Name	Heritage Rank	State Status	Federal Status	Distribution Pattern/Habitat ^a	Study Area ^b
Menzies' fiddleneck	<i>Amsinckia menziesii</i>	-	-	-	Abundant over a wide range in open ground from coastline to mid elevations, Meadow, West-Side Forest, Shrub-Steppe	Potentially present and observed during cultural survey but not observed during botanical survey
Netleaf hackberry	<i>Celtis laevigata</i>	-	-	-		Potentially present and observed during cultural survey but not observed during botanical survey
Nuttall's larkspur	<i>Delphinium nuttallianum</i>	-	-	-	Grows in open meadows, near streams, ponderosa pine woodlands, sagebrush, at low to high elevations	Potentially present and observed during cultural survey but not observed during botanical survey
Western serviceberry	<i>Amelanchier alnifolia</i>	-	-	-	Grows in open meadows, fencerows, woodlands, streambanks, conifer forests, at low to high elevations	Potentially present and observed during cultural survey but not observed during botanical survey

Notes:

- ^a Unless otherwise noted, plant habitat and distribution information are from WNHP, 2021.
- ^b Presence in the study is based on the applicant's 2015 and 2019 habitat and botanical surveys (FFP, 2020) and on a study area cultural survey (Shellenberger et al., 2019).

Heritage Rank: WNHP uses the ranking system developed by NatureServe to assess global and state conservation status of each plant species, subspecies, and variety. Taxa are ranked on a scale of 1 to 5 (from highest to lowest conservation concern).
 G = Global Rank: rangewide status of a full species; T = Trinomial Rank: rangewide status of a subspecies or variety; S = State Rank: status of a species, subspecies, or variety within the state of Washington
 1 = Critically Imperiled – at very high risk of extirpation due to very restricted range, very few occurrences, very steep declines, very severe threats, or other factors; 2 = Imperiled – at high risk of extirpation due to restricted range, few

occurrences, steep declines, severe threats, or other factors; 3 = Vulnerable – at moderate risk of extirpation due to a fairly restricted range, relatively few occurrences, recent and widespread declines, threats, or other factors; 4 = Apparently secure – at fairly low risk of extirpation due to an extensive range or many occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors; 5 = Secure – at very low risk of extirpation due to a very extensive range, abundant occurrences, and little to no concern from decline or threats

H = Historical– known from only historical occurrences (prior to 1978) but still with some hope of rediscovery

State Status: E = Endangered, in danger of becoming extinct or extirpated from Washington; T = Threatened, likely to become Endangered in Washington; S = Sensitive, vulnerable or declining and could become Threatened or Endangered in Washington; Extirp = possibly extinct or extirpated in Washington (includes state historical species)

Federal Status: E = Endangered, A species, subspecies, or variety in danger of extinction throughout all or a significant portion of its range; T = Threatened, A species, subspecies, or variety likely to become Endangered in the foreseeable future; Prop = Proposed, A species, subspecies, or variety formally proposed for listing as Endangered or Threatened (a proposal has been published in the Federal Register, but not a final rule); Cand = Candidate, A species, subspecies, or variety being evaluated by FWS for potential listing as Threatened or Endangered under the ESA, but no formal proposal has been published yet.

Table 3.3.4-3. Wetlands and waterbodies in the project area (source: FFP, 2020 and Washington DOE, 2022a).

Feature	NHD Classification	NWI Classification ^a	Field Description	Cowardin Classification ^a	Surface Connection to Other Waters?	Area (Acres)
<i>Northern/Upper Portion of the Project Area (Swale Creek Watershed/Upper Reservoir Area)</i>						
Stream S7	Perennial water course	R5UBH	Intermittent stream with ephemeral upstream extent; channel is 16 to 24 inches wide, 1 to 3 inches deep, and extends approximately 995 feet into the project boundary; no flowing water was observed, but	N/A	Yes	0.046

Feature	NHD Classification	NWI Classification^a	Field Description	Cowardin Classification^a	Surface Connection to Other Waters?	Area (Acres)
			much of the substrate was covered with algal matting			
Stream S8	Perennial water course	R5UBH	Intermittent stream; channel is 12 to 24 inches wide, 1 to 3 inches deep, and extends approximately 990 feet into the project boundary; no flowing water was observed, several pockets of standing water were observed, and much of the substrate was covered with algal matting	N/A	Yes	0.045
Stream 1 ^b	Not identified	Not identified	Ephemeral stream: channel is 8 to 12 inches wide, 1 to 3 inches deep, and about 773 feet long; no flowing water was observed in the channel, but much of the substrate was covered with algal matting	N/A	Yes	0.018
Pond/Wetland P1 ^c	Perennial pond	PUBHx	Perennial excavated pond for cattle with wetland characteristics; Unidentified emergent vegetation was observed	PUBFx	No	0.010

Feature	NHD Classification	NWI Classification ^a	Field Description	Cowardin Classification ^a	Surface Connection to Other Waters?	Area (Acres)
			growing in 1 to 2 feet of standing water.			
Pond/Wetland P2	Perennial pond	Not identified	Excavated pond for cattle with wetland characteristics; edges of the pond are largely unvegetated, and no emergent vegetation was observed growing within the water. Historic aerial imagery suggests that the pond dries up entirely most years	PUBCx	No	0.027
Area Subtotal						0.0146
<i>Southern/Lower Portion of the Project Area (Columbia Tributaries Watershed/Lower Reservoir Area)⁴</i>						
Stream S17	Intermittent	R4SBC/PSS1A	Intermittent stream; channel about 24 inches wide, 1 to 3 inches deep; Flowing water 1 to 3 inches deep was observed above the highway; however, no water was observed exiting the culvert at the outlet on the southeast side of the highway.	R4SBJ	No	0.031

Feature	NHD Classification	NWI Classification^a	Field Description	Cowardin Classification^a	Surface Connection to Other Waters?	Area (Acres)
Stream S24	Not identified	Not identified	Intermittent stream; appears to be a groundwater seep located along the excavated hillside above Highway 14. Water flows down the hillside into a roadside drainage ditch and into a culvert that conveys the water to east side of the highway. No flowing water was observed existing the culvert outlet	R4SBJ	No	0.060
Stream 2 ^d	Not identified	Not identified	Intermittent stream; channel 24 inches wide, 1 to 3 inches deep, and approximately 316 feet long. No water was observed in the channel	R4SBJ	No	0.015
Wetland W6	Not identified	Not identified	Herbaceous wetland; both flowing and standing water was observed but there appears to be no surface connection to Stream S17, which is located about 70 feet downslope.	PEM1C	No	0.003

Feature	NHD Classification	NWI Classification^a	Field Description	Cowardin Classification^a	Surface Connection to Other Waters?	Area (Acres)
Wetland 1	Not identified	Not identified	Scrub-shrub/herbaceous wetland; stream does not appear to cross SR 14, and water collects in a depression formed by the road fill embankment	PSS/PEM1C	Yes	0.020
Wetland 2	Not identified	Not identified	Scrub-shrub/herbaceous wetland; The stream does not cross SR 14 due to a damaged culvert	PSS/PEM1C	Yes	0.037
Wetland A ^e	Not identified	Not identified	Herbaceous wetland; fed by a spring that has been piped to an overflowing livestock watering trough. Site observations and aerial photography indicates the wetland has seasonal hydrology and no surface connection to other wetlands or waters	PEM1C	No	0.028
Wetland B ^f	Not identified	Not identified	Scrub-shrub wetland located in an excavated ditch fed by stormwater that drains from the north through ditches to the wetland, but the wetland has no surface water outlet	PSS1C	No	0.051

Feature	NHD Classification	NWI Classification ^a	Field Description	Cowardin Classification ^a	Surface Connection to Other Waters?	Area (Acres)
Wetland C	Not identified	Not identified	Herbaceous wetland; isolated depression that has seasonal standing water likely provided by a high groundwater table, direct precipitation, and overland runoff.	PEM1C	No	0.049
Wetland D ^g	Not identified	PEM1Ch	Scrub-shrub wetland fed by a seasonal spring, which flows into a small pond and then continues west through a culvert to a small depression. The spring likely provides water to the wetland throughout the year, although much of the wetland dries out in the summer.	PSS1C	No	13.784
Area Subtotal						14.078
<i>Aerial Transmission Line Right of Way^h</i>						
Stream S20 (Columbia River/Lake Celilo)	Perennial water course	L1UBHh	Impounded pool of Columbia River	N/A	Yes	Not Calculated
Stream S23	Intermittent water course	R4SBC	Ephemeral unvegetated swale	R4SBC	No	Not Calculated

Feature	NHD Classification	NWI Classification ^a	Field Description	Cowardin Classification ^a	Surface Connection to Other Waters?	Area (Acres)
Stream S21	Intermittent water course	R4SBC	Scott Canyon	R4SBC	No	Not Calculated
Stream S22	Intermittent water course	R4SBC	Gerking Canyon	R4SBC	No	Not Calculated
Total Area						14.224

- ^a Cowardin system wetland codes: L1UBHh = Lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded; PEM1C = palustrine, emergent, persistent, seasonally flooded; PEM1Ch = palustrine, emergent, persistent, seasonally flooded, diked/impounded; PSS1A = palustrine, scrub-shrub, broad-leaved deciduous, temporary flooded; PSS1C = palustrine scrub-shrub, broad-leaved deciduous, seasonally flooded; PSS/PEM1C = palustrine scrub-shrub/palustrine emergent, persistent, seasonally flooded; PUBCx = palustrine, unconsolidated bottom, seasonally flooded, excavated; PUBHx = palustrine, unconsolidated bottom, permanently flooded; PUBFx = palustrine, unconsolidated bottom, semipermanently flooded, excavated; R4SBC = riverine, intermittent, streambed, seasonally flooded; R5UBH = riverine, unknown perennial, unconsolidated bottom, permanently flooded
- ^b Also known as Stream S1.
- ^c Pond/Wetland P1 extends outside the project area to the north.
- ^d Stream 2 was first identified in an area located immediately north of SR 14 and approximately 350 feet east of Stream S17. During the 2022 investigation, no distinct channel was observed in this area and vegetation consisted of facultative -only species. The area showed evidence of previous flow with dead blackberry brambles wrapped around adjacent tree trunks, although no flow was observed during the time of the investigation. Hydric soils were also not observed in the soil pit dug in the area. Therefore, the area of Stream 2 is no longer considered a stream.
- ^e Wetland A was delineated on the CGA smelter site in the southern portion of the study area, south of SR 14, but during 2022 investigations, the vegetation consisted of facultative-only species with no signs of wetland hydrology or other indicators suggesting wetland. Therefore, the area of Wetland A is no longer considered wetland.

- f Wetland B was delineated on the CGA smelter site in the southern portion of the study area, south of SR 14, but during 2022 investigations, this area was observed to be a linear, graded ditch, with gentle sloping sides. Vegetation consisted of facultative-only species with no signs of wetland hydrology, other than the concave shape of the ditch. The soil pit dug at the lowest elevation indicated that hydric soils were not present. Therefore, the area of Wetland B is no longer considered wetland.
- g Wetland D extends outside the project area to the east.
- h Surface waters in the proposed aerial transmission line ROW were assessed using desktop methods and were not verified or delineated in the field.

Table 3.3.4-4. Special status wildlife with the potential to occur at the project (source: FFP, 2020; Washington DOE, 2022a).

Common Name	Species Name	State Status	Federal Status	Habitat	Potential Occurrence in Project Area ^a
<i>Birds</i>					
American peregrine falcon	<i>Falco peregrinus anatum</i>	PS (WA) SS (OR)		Historic populations have been reported along the Columbia River Basin in the project boundary; observed in the project vicinity.	Yes
Bald eagle	<i>Haliaeetus leucocephalus</i>	SS (OR)	BCC; BGEPA	Found primarily near coastlines, rivers, reservoirs, and lakes. Bald eagles principally eat fish, but also feed on carrion, waterfowl, and small mammals. Use large trees as nest sites and hunting perches. Documented along the Columbia River Basin and observed in the project vicinity.	Yes
Bufflehead	<i>Bucephala albeola</i>	PS (WA)		Cavity-nesting duck. Documented mortality at Columbia Plateau wind farms.	Yes
Cassin's finch	<i>Carpodacus cassinii</i>		BCC	Conifer belts of North America's western interior mountains, from central British Columbia to northern New Mexico and Arizona	Yes

Common Name	Species Name	State Status	Federal Status	Habitat	Potential Occurrence in Project Area ^a
Chukar	<i>Alectoris chukar</i>	PS (WA)		Dry high-elevation shrublands between 4,000 and 13,000 feet. They usually occur on steep, rocky hillsides with a mixture of brush, grasses, and forbs. They also occur across barren plateaus and deserts with sparse grasses	Yes
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>	SS (OR)		Bunchgrass prairies with deciduous shrubs and trees. Potential habitat present in the project area.	Yes
Common nighthawk	<i>Chordeiles minor</i>	SS (OR)		Sagebrush, prairies, plains, grasslands, and open forests. Potential habitat present in the project area	Yes
Ferruginous hawk	<i>Buteo regalis</i>	SE (WA) SS (OR)		Breed in grasslands, sagebrush, shrublands, and edges of pinyon-juniper forests (Cornell 2015). Observed in the project vicinity.	Yes
Flammulated owl	<i>Otus flammeolus</i>	SC (WA) SS (OR)		Forests of large diameter (>50 cm diameter at breast height) ponderosa pine/Douglas-fir or grand fir with ponderosa pine in the overstory.	Yes
Golden eagle	<i>Aquila chrysaetos</i>	SC (WA) SS (OR)	BGEPA	Associated with steep terrain and found grasslands, shrub-steppe, and dry open forests of eastern Washington, canyonlands, and high-elevation alpine zones. Hunts for prey in grasslands and shrublands. Nests on cliff ledges, rocky outcrops, large trees, or human-made structures.	Yes
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SS (OR)		Grasslands, prairies, little to no shrub cover, potentially in the project area.	Yes
Great blue heron	<i>Ardea herodias</i>	PS (WA)		Found in freshwater and saltwater habitats and forage in grasslands and agricultural fields	Yes
Lewis' woodpecker	<i>Melanerpes lewis</i>		BCC	Breed in ponderosa pine forests or oak/pinyon-juniper woodlands. When not breeding, they occur in cottonwoods near streams, orchards, and oak woodlands.	Yes

Common Name	Species Name	State Status	Federal Status	Habitat	Potential Occurrence in Project Area ^a
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC (WA) SS (OR)		Open country, including shrub-steppe and grasslands throughout eastern Washington. They generally nest in dense, thorny trees, or shrubs.	Yes
Long-billed curlew	<i>Numenius americanus</i>	SS (OR)		Summer in sparse short shortgrass and mixed-grass prairies as well as agricultural fields.	Yes
Long-eared owl	<i>Asio otus</i>		BCC	Dense vegetation for nesting and forage in open grasslands or shrublands; also open coniferous or deciduous woodlands.	Yes
Mallard	<i>Anas platyrhynchos</i>	PS (WA)		Lakes and Ponds and almost any wetland habitat	Yes
Northern pintail	<i>Anas acuta</i>	PS (WA)		Nests in seasonal wetlands, croplands, grasslands, wet meadows, and shortgrass prairies. Forage in nearby shallow wetlands, lakes, and ponds.	Yes
Pileated woodpecker	<i>Dryocopus pileatus</i>	SC (WA) SS (OR)		Mature deciduous or mixed deciduous-coniferous woodlands of nearly every type and can be found in suburban areas.	Yes
Prairie falcon	<i>Falco mexicanus</i>	PS (WA)		Inhabits the arid environments of eastern Washington, nesting on cliffs and hunting in steppe and shrub-steppe habitat	Yes
Ring-necked pheasant	<i>Phasianus colchicus</i>	PS (WA)		Agricultural areas west of the Cascades, but the grain-producing lands on the east side of the state provide the best habitat and the highest populations.	Yes
Rufous hummingbird	<i>Selasphorus rufus</i>		BCC	Open or shrubby areas, forest openings, yards, and parks, and sometimes in forests, thickets, swamps, and meadows.	Yes
Sage thrasher	<i>Oreoscoptes montanus</i>	SC (WA)		Large patches and expanses of sagebrush for breeding, as well as small fragments of sagebrush among agricultural. Required dense ground cover.	Yes
Sagebrush sparrow	<i>Artemisiospiza nevadensis</i>	SC (WA)		Sagebrush/bunchgrass shrub-steppe landscapes with shrubs up to 6-feet tall. Can nest in sagebrush-juniper habitat bordering	Yes

Common Name	Species Name	State Status	Federal Status	Habitat	Potential Occurrence in Project Area ^a
				sagebrush steppe; in winter migration use dry shrublands or grasslands.	
Swainson's hawk	<i>Buteo swainsoni</i>	SS (OR)		Open areas for foraging, prairie, grassland.	Yes
Western bluebird	<i>Sialia mexicana</i>	SS (OR)		Open woodlands, edges of woods, and disturbed areas.	Yes
Western grebe	<i>Aechmophorus occidentalis</i>	SC (WA)		Large freshwater lakes, reservoirs, and marshes in eastern Washington during the summer breeding season.	Yes
Western meadowlark	<i>Sturnella neglecta</i>	SS (OR)		Open grasslands, shrub-steppe, and meadows.	Yes
White-headed woodpecker	<i>Dryobates albolarvatus</i>	SC (WA) SS (OR)		Montane coniferous forests dominated by pine. Usually associated with ponderosa pine.	Yes
Yellow-breasted chat	<i>Icteria virens</i>	SS (OR)		Dense shrubbery like blackberry bushes in shrub-steppe habitats	Yes
<i>Mammals</i>					
California myotis	<i>Myotis californicus</i>	PS (WA) SS (OR)		Deserts, canyons, shrub-steppe, arid grasslands, and dry interior forests, as well as moister environments such as coastal and montane forests comprised of deciduous or coniferous trees, riparian forests, and mountain meadows.	Yes
Hoary bat	<i>Lasiurus cinereus</i>	SS (OR)		Mostly forest associated, can occur in open areas like grasslands.	Yes
Little brown bat	<i>Myotis lucifugus</i>	PS (WA)		Conifer and hardwood forests, but also occupies open forests, forest margins, shrub-steppe, clumps of trees in open habitats, sites with cliffs, and urban areas	Yes
Long-legged myotis	<i>Myotis volans</i>	SS (OR)		Mostly occur in coniferous forests, moist or dry, but also occur in riparian forests and dry rangeland.	Yes

Common Name	Species Name	State Status	Federal Status	Habitat	Potential Occurrence in Project Area ^a
Pallid bat	<i>Antrozous pallidus</i>	SS (OR)		Prefers drier areas like shrub-steppe, deserts, canyons, and dry coniferous forest, can occur in oak woodland; commonly associated with cliffs, rock outcrops and water sources.	Yes
Preble's shrew	<i>Sorex preblei</i>	PS (WA)		Open areas, woodlands, and forests; occurs in southwest Washington.	Yes
Silver-haired bat	<i>Lasionycteris noctivagans</i>	SS (OR)		Forests and riparian zones; may occur in shrub-steppe areas during migration.	Yes
Spotted bat	<i>Euderma maculatum</i>	SS (OR)		Dry climates, roost in high cliffs.	Yes
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SC (WA)		Conifer-hardwood forests, ponderosa pine forest, and woodlands, shrub-steppe and riparian forest/wetlands and open fields. Roosts include caves, abandoned mines, buildings, concrete bunkers, tunnels, and bridges.	Yes
Western gray squirrel	<i>Sciurus griseus</i>	ST (WA)		Distribution closely correlated with Oregon white oak habitat, probably due to squirrels' dependence on acorns as a winter food source. Known populations of western gray squirrel exist in the oak woodlands to the northeast of the study area. However, their habitat does not exist at the project site and not likely to occur at the site.	No
White-tailed jackrabbit	<i>Lepus townsendii</i>	SC (WA)		Prairies and the semi-arid portions of the Columbia Plateau.	Yes
<i>Reptiles</i>					
California mountain kingsnake	<i>Lampropeltis zonat</i>	SC (WA)		The Columbia River Gorge is considered the northern extreme of its range	Yes
Sagebrush lizard	<i>Sceloporus graciosus</i>	SC (WA)		Vegetated sand dunes and associated sandy habitats that support shrubs and have large areas of bare ground.	Yes

Common Name	Species Name	State Status	Federal Status	Habitat	Potential Occurrence in Project Area ^a
Striped whipsnake	<i>Masticophis taeniatus</i>	SC (WA)		Shrub-steppe obligates and occur primarily in the driest areas of the central Columbia Basin.	Yes
Western rattlesnake	<i>Crotalus oregonus</i>			Deserts and shrub-steppe and open forests.	Yes
<i>Amphibians</i>					
Western toad	<i>Anaxyrus boreas</i>	SC (WA) SS (OR)		Wide range of habitat, forests, mountain meadows, desert flats	Yes
<i>Invertebrates</i>					
Columbia Oregonian (snail)	<i>Cryptomastix hendersoni</i>	SC (WA)		East end of the Columbia Gorge on Oregon and Washington sides.	Not Known
Dalles sideband snail	<i>Monadenia fidelis minor</i>	SC (WA)		Cool, moist talus habitat and upland forest areas that are near seeps and springs.	Yes
Juniper hairstreak	<i>Callophrys gryneus</i>	SC (WA)		Old fields, bluffs, barrens, juniper and pinyon-juniper woodlands, and cedar breaks.	Yes
Monarch butterfly	<i>Danaus plexippus</i>		CS	Upland, wetland, and riparian habitats	Yes

^a No wildlife studies have been conducted specifically for the proposed project, and no wildlife studies have been conducted in the lower reservoir area of the study area. Where presence is documented near the study area it is based on wildlife surveys conducted for the nearby wind farm or from available Washington DFW data.

State Designations: SE = State, ST = State-Threatened, SC = State-Candidate, SS = State-Sensitive, PS = State Priority Species, only for Washington, includes all listed species and those the Washington DFW (2015) State Wildlife Action Plan's lists as Species of Greatest Conservation Need.

Federal Designations (FWS 2021c): FE = Federal Endangered, FT = Federal Threatened, CS = Candidate Species, BCC = Bird of Conservation Concern, BGEPA = protected by the Bald and Golden Eagle Protection Act

Table 3.3.4-5. Temporary and permanent effects on vegetation from the proposed project (source: FFP, 2021a).

Vegetation Type	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Columbia Plateau Steppe and Grassland	7.5	49.6
Columbia Plateau Scabland Shrubland	0	1.8
Inter-Mountain Basins Cliff and Canyon	0	0.6
Inter-Mountain Basins Big Sagebrush Steppe	8.1	40.8
Columbia Plateau Western Juniper Woodland and Savanna	0.8	0.2
Introduced/Invasive Annual Grassland	37.1	90.4
Introduced/Invasive Wooded	0	0.9
Developed/Disturbed	0.8	9.3
Total	54.3	193.6

Table 3.3.4-7. Direct wetland and waterbody effects from project construction (source: Washington DOE, 2022a).

Feature	Area of Stream Impact (Acres)	Area of Buffer Impact (Acres)	Duration	Cause of Impact
<i>Northern/Upper Portion of the Project Area (Swale Creek Watershed/Upper Reservoir Area)</i>				
Stream S7	0.041	1.006	Permanent	Construction of the upper reservoir would result in excavation and backfilling portions of Stream S7 and its buffer area.
Stream S8	0.037	0.886	Temporary	Portions of Stream S8 and its buffer area would be affected by temporary laydown areas for stockpiling upper reservoir excavated materials .
Stream S8	0.003	0.100	Permanent	Construction of the upper reservoir would result in excavation and backfilling portions of Stream S8 and its buffer area.
Stream 1	0.004	0.289	Permanent	Construction of the upper reservoir would result in excavation and backfilling portions of Stream 1 and its buffer area.
Pond/Wetland P1	0	0	N/A	N/A
Pond/Wetland P2	0.027	N/A	Permanent	Construction of the upper reservoir would result in excavation and backfilling of all Pond/Wetland P2.
<i>Southern/Lower Portion of the Project Area (Columbia Tributaries Watershed/Lower Reservoir Area)</i>				
Stream S17	0	0	N/A	N/A
Stream S24	0	0	N/A	N/A
Stream 2	0	0	N/A	N/A
Wetland W6	0	0	N/A	N/A
Wetland 1	0	0	N/A	N/A

Feature	Area of Stream Impact (Acres)	Area of Buffer Impact (Acres)	Duration	Cause of Impact
Wetland 2	0	0	N/A	N/A
Wetland A	0.013	N/A	Temporary	Portions of Wetland A would be affected by temporary laydown areas for stockpiling excavated materials near the lower reservoir
Wetland A	0.015	N/A	Permanent	Construction of the lower reservoir would result in excavation and backfilling a portion of Wetland A.
Wetland B	0.009	N/A	Temporary	Portions of Wetland B would be affected by temporary laydown areas for stockpiling excavated materials near the lower reservoir.
Wetland C	0	0	N/A	N/A
Wetland D	0	0	N/A	N/A
<i>Aerial Transmission Line Right of Way⁴</i>				
Stream S20 (Columbia River/Lake Celilo)	0	0	N/A	N/A
Stream S23	0	0	N/A	N/A
Stream S21	0	0	N/A	N/A
Stream S22	0	0	N/A	N/A

Table 3.3.5-1. Spring (April 1–June 5) salmonid passage counts at John Day Dam (1990–2022) (source: Columbia Basin Research, 2022b).

Year	Adult Chinook	Jack Chinook	Steelhead	Sockeye	Adult Coho	Jack Coho	Shad	Lamprey	Bull Trout	Chum
1990	42350	777	4054	2	0	0	181043	0	0	0
1991	20014	1833	3311	0	0	0	17012	0	0	0
1992	43716	1741	1837	68	0	0	692910	0	0	0
1993	55552	592	4460	8	0	0	75822	0	0	0
1994	9551	194	2767	0	0	0	122645	0	0	0
1995	4601	1175	2130	13	0	0	250403	0	0	0
1996	18651	2948	2188	9	0	0	2797	0	0	0
1997	62253	327	3157	15	0	0	565	0	0	0
1998	21800	377	5477	4	0	0	7944	0	0	0
1999	15409	5089	3564	3	0	0	8776	120	0	0
2000	86553	12157	3468	325	2	0	156134	42	0	0
2001	264177	6208	2791	143	0	0	688262	108	0	0
2002	139887	2403	8422	7	0	0	183742	180	0	0
2003	101436	10206	1662	48	0	0	312488	734	0	0
2004	112153	6367	2290	463	0	0	0	287	0	0
2005	56027	2715	1487	50	0	0	0	120	0	0
2006	50313	2093	2492	8	0	0	0	15	0	0
2007	43384	13663	2344	92	1	0	0	89	0	0
2008	81772	14925	3475	61	0	0	0	57	0	0
2009	76806	49733	3356	132	0	0	0	75	0	0
2010	179446	11794	2747	347	0	0	0	18	0	0

Year	Adult Chinook	Jack Chinook	Steelhead	Sockeye	Adult Coho	Jack Coho	Shad	Lamprey	Bull Trout	Chum
2011	103401	39823	2850	1	0	0	0	2	0	0
2012	107655	6755	2005	272	0	0	0	4	0	0
2013	56991	28957	1025	135	0	0	0	41	0	0
2014	123204	19096	883	54	0	0	0	139	0	0
2015	166015	11514	702	626	0	0	0	139	0	0
2016	93659	8262	422	1223	0	0	0	358	0	0
2017	46675	12475	533	124	0	0	0	353	0	0
2018	50561	5054	162	121	0	0	0	167	0	0
2019	35127	6000	244	51	0	0	0	44	0	0
2020	39076	4035	225	274	0	0	0	35	0	0
2021	51223	10193	263	44	0	0	0	27	0	0
2022	98744	17562	166	173	0	0	0	24	0	0

Table 3.3.5-2. Summer (June 6–August 5) salmonid passage counts at John Day Dam (1990–2022) (source: Columbia Basin Research, 2022b).

Year	Adult Chinook	Jack Chinook	Steelhead	Sockeye	Adult Coho	Jack Coho	Shad	Lamprey	Bull Trout	Chum
1990	18384	2148	14362	41974	0	0	1459663	0	0	0
1991	14274	2598	18361	63516	0	0	1364334	0	0	0
1992	11242	2668	16048	69539	0	0	1269050	0	0	0
1993	17493	871	14436	61109	0	0	570340	0	0	0
1994	12025	910	9406	11155	0	0	813067	0	0	0
1995	10376	1100	10641	8641	0	0	782805	0	0	0

Year	Adult Chinook	Jack Chinook	Steelhead	Sockeye	Adult Coho	Jack Coho	Shad	Lamprey	Bull Trout	Chum
1996	11830	1318	18176	25671	0	0	955695	0	0	0
1997	20508	1261	19917	35642	0	0	1006678	0	0	0
1998	16246	1534	12665	9726	0	0	1016809	0	0	0
1999	22210	2504	27078	14780	0	0	753533	2032	0	0
2000	23023	8033	31071	87997	0	0	695204	2726	0	0
2001	64186	10049	78376	107611	68	3	1108306	2453	0	0
2002	105354	5615	54961	41888	0	0	1666463	11916	0	0
2003	95542	10073	34602	35298	0	0	2421241	13662	0	0
2004	72518	10542	28538	112964	0	0	0	7912	0	0
2005	64034	5405	31763	69654	0	0	0	5754	0	0
2006	73814	4150	19711	35284	2	-2	0	6417	0	0
2007	36191	11717	21947	24037	0	1	0	3987	0	0
2008	63649	13680	57570	193235	0	0	0	3251	0	0
2009	65989	33147	52193	157147	2	7	0	1582	0	0
2010	70955	12475	88875	323702	8	3	0	999	0	0
2011	75375	35544	58074	143464	0	1	0	1357	0	0
2012	60814	10415	38574	393725	9	0	0	2302	0	0
2013	75248	19714	25186	155160	2	1	0	3958	0	0
2014	86033	17655	35529	556809	0	0	0	5743	0	0
2015	108768	10988	14507	363019	0	0	0	6083	0	0
2016	90259	7715	13891	288114	0	0	0	6267	0	0
2017	60416	7363	3757	65701	0	0	0	17522	0	0

Year	Adult Chinook	Jack Chinook	Steelhead	Sockeye	Adult Coho	Jack Coho	Shad	Lamprey	Bull Trout	Chum
2018	42835	4293	7038	168140	1	0	0	6948	0	0
2019	39000	8116	5393	52348	13	1	0	3367	0	0
2020	70466	9069	12407	309481	0	0	0	1895	0	0
2021	55817	10292	3431	126304	0	0	0	4778	0	0
2022	65893	10747	10317	604500	0	0	0	3755	0	0

Table 3.3.5-3. Fall (August 6–October 31) salmonid passage counts at John Day Dam (1990–2022) (source: Columbia Basin Research, 2022b).

Year	Adult Chinook	Jack Chinook	Steelhead	Sockeye	Adult Coho	Jack Coho	Shad	Lamprey	Bull Trout	Chum
1990	73384	19270	89433	101	1521	1502	1237	0	0	0
1991	55987	24215	138585	244	6692	1329	663	0	0	0
1992	54983	17675	177309	124	1710	923	1100	0	0	0
1993	59039	8158	76746	101	2679	316	935	0	0	0
1994	86202	17763	80902	15	2455	387	246	0	0	0
1995	68108	21917	110475	13	1913	204	519	0	0	0
1996	88050	7805	135638	18	3289	990	770	0	0	0
1997	86805	14086	133964	173	3518	711	653	0	0	0
1998	78237	11834	140405	107	7646	851	291	0	0	0
1999	106052	12018	134672	26	11901	1331	698	7720	0	0
2000	102903	36702	185789	50	20563	3404	260	3094	0	0
2001	124747	41620	402242	115	48802	2308	258	1444	0	0
2002	164920	29550	326917	20	7669	1603	737	14725	0	0

Year	Adult Chinook	Jack Chinook	Steelhead	Sockeye	Adult Coho	Jack Coho	Shad	Lamprey	Bull Trout	Chum
2003	215501	34327	249912	71	34453	4124	1379	6526	0	0
2004	213936	30787	196371	70	32627	2128	0	3464	0	0
2005	179634	14748	189924	66	30869	3328	0	2438	0	0
2006	135831	22233	194919	95	28866	4912	0	3168	0	1
2007	73443	35936	202907	148	33018	6208	0	1668	0	0
2008	136743	32183	216117	113	39975	4923	0	3317	0	0
2009	145069	81230	526096	123	64891	6839	0	387	0	0
2010	214344	45233	192190	79	21498	1763	0	645	0	0
2011	180404	63224	196421	140	62795	2872	0	2207	0	0
2012	166974	91523	121504	169	30207	3643	0	2281	0	0
2013	437516	89119	124744	203	16161	1364	0	2674	0	0
2014	440511	79692	164426	668	107853	7987	0	2695	0	0
2015	533979	60314	164297	2719	18762	3066	0	2148	0	0
2016	267446	39747	116313	639	17019	2616	0	3144	0	0
2017	165526	21431	78963	216	29080	5166	0	5529	0	0
2018	105939	18901	63810	208	16485	2885	0	1427	0	0
2019	137537	24190	45317	127	29834	4263	0	1175	0	0
2020	195255	35312	67071	204	45989	9117	0	1111	0	0
2021	169970	28474	51086	360	132057	13562	0	1383	0	0

Table 3.3.5-4. ESA-listed fish species with designated^a critical habitat in the vicinity of the proposed Goldendale Project (source: NMFS, 2022b and FWS, 2022d).

Species	Critical Habitat Reach
Snake River Fall-run Chinook ESU	Columbia River from the mouth upstream to Snake River Confluence and Snake River
Snake River Spring/Summer-run Chinook ESU	Columbia River from the mouth upstream to Snake River Confluence and Snake River
Snake River Sockeye ESU	Columbia River from the mouth upstream to Snake River Confluence and Snake River
Snake River Steelhead DPS	Columbia River from the mouth upstream to Snake River Confluence and Snake River
Upper Columbia River Spring-run Chinook ESU	Columbia River
Upper Columbia River Steelhead DPS	Columbia River
Middle Columbia River Steelhead DPS	Lower most 12 miles of Swale Creek, Klickitat River, Columbia River
Lower Columbia River Steelhead DPS	Columbia River from the mouth upstream to the Hood River Confluence
Lower Columbia River coho salmon ESU	Columbia River from the mouth upstream to the Hood River Confluence
Lower Columbia River Chinook ESU	Columbia River from the mouth upstream to the Hood River Confluence
Columbia River chum ESU	Columbia River from the mouth upstream to the Hood River Confluence
Bull trout	Columbia River, Klickitat River, John Day River

^a Critical habitat for Snake River Sockeye salmon, Snake River spring/summer Chinook salmon, and Snake River fall Chinook salmon was designated on December 28, 1993 (58 FR 68543); for Snake River steelhead, Upper Columbia River spring-run Chinook, Upper, Middle, and Lower Columbia River Steelhead, Lower Columbia River Chinook, and Columbia River chum on September 2, 2005 (70 FR 52629); for Lower Columbia River coho salmon on February 25, 2016 (81 FR 9251); and for bull trout on October 18, 2010 (75 FR 63898).

Table 3.3.8-1. Goldendale Project archaeological resources (source: adapted from FFP, 2021b).

District/Site/ Isolated Find	Recordation	Type	Description	National Register Eligibility
45DT241	Previous	Precontact/Historic	Columbia Hills Archaeological District	Eligible
45KL566	Previous	Precontact	Lithic Scatter	Eligible (A, B, D)
45KL567 (including 45KL569/570)	Previous	Precontact	Lithic Scatter	Eligible (A, B, D)
45KL744 (including 45KL745)	Previous	Precontact/Historic	Lithics, historic debris and features	Eligible (A, B, D)
45KL746	Previous	Precontact/Historic	Lithic scatter, historic debris and features	Eligible (A, B, D)
45KL2476	New	Precontact	Lithic scatter	Eligible (A, B, D)
45KL772	Previous	Precontact	Single lithic flake (Isolated find)	Not relocated
45KL1712	Previous	Precontact	Lithic Scatter (single artifact in APE)	Not relocated
45KL1296	Previous	Precontact	Single lithic flake (Isolated find)	Unevaluated; out of affected area
45KL1297	Previous	Precontact	Lithic biface (Isolated find)	Unevaluated; out of affected area
45KL1298	Previous	Precontact	Lithic scatter	Unevaluated; out of affected area
45KL2026	Previous	Precontact	Lithic scatter	Unevaluated; out of affected area

Table 3.3.8-2. Project-related effects on archaeological resources within the APE (source: adapted from FFP, 2021b).

District/Site/ Isolated Find	Description	Project-related effects
45DT241	Columbia Hills Archaeological District	None. Effects are limited to the five individual archaeological sites
45KL566	Lithic Scatter	Adverse: Reservoir and berm construction
45KL567 (incl.45KL569/570)	Lithic Scatter	Adverse: Reservoir and berm construction, laydown, access road
45KL744 (incl. 45KL745)	Lithics, historic debris and features	Adverse: Reservoir, berm, and tunnel construction, laydown area
45KL746	Lithic scatter, historic debris and features	Adverse: Reservoir and berm construction, laydown area
45KL2476	Lithic scatter	Adverse: Reservoir and berm construction
45KL772	Single lithic flake (isolated find)	Not relocated during 2019 survey
45KL1712	Lithic scatter (single artifact in APE)	Not relocated during 2019 survey
45KL1296 (ISO)	Single lithic flake (isolated find)	None anticipated
45KL1297 (ISO)	Lithic biface (isolated find)	None anticipated
45KL1298	Lithic scatter	None anticipated
45KL2026	Lithic scatter	None anticipated

Table 3.3.9-1. Klickitat and Sherman County population, race and housing demographics (source: U.S. Census Bureau, 2020).

	Klickitat County	Sherman County	Total
Population			
2020 Census Population	22,735	1,870	24,605
2010 Census Population	20,318	1,765	22,083
% Change	11.9%	5.9%	11.4%
Racial Demographics			
	Klickitat County	Sherman County	Weighted Total
White	92.8%	94.4%	92.9%
Black or African American	0.7%	0.3%	0.7%
American Indian and Alaska Native	2.6%	2.5%	2.6%
Asian	1.0%	0.7%	1.0%
Native Hawaiian and Other Pacific Islander	0.2%	0.1%	0.2%
Two or more other races	2.7%	2.1%	2.7%
Housing and Family			
	Klickitat County	Sherman County	
Persons per Household (2016–2020)	2.35	2.30	

Table 3.3.9-2. Study area total revenues (source: Oregon DOR, 2022).

	FY2017	FY2018	FY2019	CAGR
Klickitat County Revenue	\$43,189,096	\$41,057,573	\$44,752,139	1.2%
City of Goldendale Revenue	\$4,743,926	\$5,665,742	\$5,582,466	5.6%
Sherman County Revenue	\$3,682,951	\$2,189,012	\$2,146,228	-16.5%
City of Wasco Revenue	\$197,423	\$202,790	\$235,735	6.1%

Table 3.3.9-3. Housing units and vacancy rates in Klickitat, Sherman, and Wasco Counties
(source: U.S. Census Data, n.d.).

	Total Housing Units (number)	Total Vacancies (number)	Vacant Housing Units (%)
Klickitat County	10,626	1,358	13%
- Goldendale	1,764	142	8%
- Wishram	249	25	10%
Sherman County	905	178	20%
- Rufus	141	32	23%
- Wasco	450	61	14%
Wasco County	11,712	1,379	12%
- The Dalles	9,167	635	7%

Table 3.3.10-1. Goldendale environmental justice data table using 2022 5-year estimates for Klickitat County (WA) (source: U.S. Census Data, n.d.).

Geographic Area	Total Population	White (%) ^a	African American/Black (%) ^a	American Indian/Alaska Native (%) ^a	Asian (%) ^a	Native HI & Other Pacific Islander (%) ^a	Some Other Race (%) ^a	Two or More Races (%) ^a	Hispanic Origin (any race) (%) ^a	Total Minority Population (%) ^a	Households in Poverty (%) ^b
WASHINGTON	7,688,549	65.5%	3.8%	0.9%	9.1%	0.7%	0.5%	6.1%	13.5%	34.5%	9.6%
Klickitat County*	22,798	80.2%	0.8%	0.8%	0.6%	0.2%	>0.1%	4.6%	12.6%	19.8%	12.7%
Census Tract 9501.01, Block Group 1	971	69.6%	0.3%	0.0%	0.0%	0.0%	0.0%	5.1%	24.9%	30.4%	8.3%
Census Tract 9501.02, Block Group 2	1,157	90.8%	0.0%	2.4%	0.0%	4.8%	0.0%	1.5%	0.4%	9.2%	16.4%
Census Tract 9501.03, Block Group 1	1,505	85.6%	5.6%	0.0%	1.1%	0.0%	0.0%	7.2%	0.6%	14.4%	5.2%
Census Tract 9501.03, Block Group 2	1,474	96.6%	<0.1%	0.0%	0.7%	0.0%	0.0%	2.6%	0.0%	3.4%	20.1%
Census Tract 9501.03, Block Group 4	557	93.0%	0.0%	4.1%	0.0%	0.0%	0.0%	0.0%	2.9%	7.0%	6.0%
Census Tract 9502, Block Group 1	1,088	94.0%	0.5%	0.9%	1.5%	0.0%	0.9%	1.6%	0.6%	6.0%	16.8%

* Reference Community

^a Percent of Total Population (Table B03002 – Hispanic or Latino Origin by Race. 2022 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates: <https://data.census.gov/table?d=ACS+5-Year+Estimates+Detailed+Tables&tid=ACSDT5Y2022.B03002>). Accessed December 11, 2023.

^b Percent of Households (Table B17017 – Poverty Status in the Past 12 Months by Household Type and Age of Householder. 2022 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates: <https://data.census.gov/cedsci/table?d=ACS%205-Year%20Estimates%20Detailed%20Tables&tid=ACSDT5Y2022.B17017>). Accessed December 11, 2023.

Gray shading denotes an Environmental Justice community.

Table 3.3.10-2 Goldendale environmental justice data table using 2022 5-year estimates for Sherman and Gilliam counties (OR)
(source: U.S. Census Data, n.d.).

Geographic Area	Total Population	White (%) ^a	African American/Black (%) ^a	American Indian/Alaska Native (%) ^a	Asian (%) ^a	Native HI & Other Pacific Islander (%) ^a	Some Other Race (%) ^a	Two or More Races (%) ^a	Hispanic Origin (any race) (%) ^a	Total Minority Population (%) ^a	Households in Poverty (%) ^b
OREGON	4,229,374	73.3%	1.8%	0.7%	4.4%	0.4%	0.4%	5.2%	13.8%	26.7%	11.6%
Sherman County*	1,900	87.1%	0.4%	0.6%	0.4%	1.9%	0.0%	4.5%	5.1%	12.9%	15.3%
Census Tract 9501, Block Group 2	935	84.3%	0.0%	0.4%	0.7%	0.0%	0.0%	5.1%	9.4%	15.7%	15.0%
Gilliam County*	1,983	83.8%	0.0%	1.4%	0.8%	0.0%	1.1%	4.6%	8.4%	16.2%	14.2%
Census Tract 9601, Block Group 1	928	82.7%	0.0%	2.4%	0.8%	0.0%	0.0%	2.4%	11.9%	17.3%	11.2%

* Reference Community

^a Percent of Total Population (Table B03002 – Hispanic or Latino Origin by Race. 2022 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates: <https://data.census.gov/table?d=ACS+5-Year+Estimates+Detailed+Tables&tid=ACSDT5Y2022.B03002>). Accessed December 11, 2023.

^b Percent of Households (Table B17017 – Poverty Status in the Past 12 Months by Household Type and Age of Householder. 2022 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates: <https://data.census.gov/cedsci/table?d=ACS%205-Year%20Estimates%20Detailed%20Tables&tid=ACSDT5Y2022.B17017>). Accessed December 11, 2023.

Gray shading denotes an Environmental Justice community.

Table 3.3.11-1. Existing noise environment at proposed construction sites near the Upper and Lower Reservoir facilities (source: staff).

Construction Site	Nearest Receptor Description	Distance from Construction Site	Estimated Existing Daytime Leq (dBA)	Estimated Existing Nighttime Leq (dBA)
Upper Reservoir	Residence on Oak Hill Road	5,600 feet northwest	40	30
Upper Reservoir	Residences on Hector Road	11,000 feet north	40	30
Lower Reservoir	Residences on Rt. 14	1,300 feet west	40	30
Lower Reservoir	Railroad Island Park	3,750 feet east	40	30
Lower Reservoir	Giles French Park	6,300 feet south	40	30
Lower Reservoir	Residences in Rufus	8,000 feet southwest	40	30

Table 3.3.11-2. Average noise levels from common construction equipment at a reference distance of 50 feet (source: FHWA, 2011).

Construction Equipment	Typical Average Noise Level at 50 feet (dBA)
Blasting	94.0
Concrete Batch Plant	83.0
Concrete Mixer Truck	78.8
Concrete Pump Truck	81.4
Dozer	81.7
Crane	80.6
Excavator	80.7
Dump Truck	76.5
Front End Loader	79.1

Table 3.3.11-3. Air quality thresholds for construction and operation phases total emissions: average tons per year over 5 year construction period (source: Washington DOE, 2022a, as modified by staff).

Pollutant	Construction Total (tons)	Total Stationary and NOC-Construction Emissions ^a	Total Operation (tons)	Total Stationary and NOC-Operational Emissions ^a	NOC Threshold	Comparison to NOC Threshold Construction/Operation	Title V Permit Threshold ^b	PSD Major Source Threshold ^c	Comparison to PSD and Title thresholds ^d Construction/Operation
PM10	1,086.20	4.39	1.07	0.70	0.75	Above/Below	100	250	Below/Below
PM2.5	118.17	4.39	1.07	0.70	0.50	Above/Above	100	250	Below/Below
NOx	216.92	89.79	36.69	24.14	2.0	Above/Above	100	250	Below/Below
CO	176.72	20.58	8.41	5.53	5.0	Above/Above	100	250	Below/Below
SO2	1.56	0.00	1.86E-06	1.22E-06	2.0	Below/Below	100	250	Below/Below
VOCs	11.81	2.64	1.08	0.71	2.0	Above/Above	100	250	Below/Below
CO2	19,318.09	NA	1,773.37	NA	NA	NA	NA	NA	NA
Methane	0.78	NA	7.19E-02	NA	NA	NA	NA	NA	NA
NO2	0.16	NA	1.44E-02	NA	NA	NA	NA	NA	NA
CO2e ^{e,f}	19,382.74 metric tons	NA	1,779.30 metric tons	NA	NA	NA	NA	NA	NA

Notes: NA = not applicable; NOC = Notice of Construction; PSD = Prevention of Significant Deterioration

- a Stationary emissions include non-fugitive and stationary construction emissions, which are limited to the concrete batch plant and generators.
- b Title V operation permit thresholds codified in C.F.R. 40.40.
- c PSD major source thresholds codified in C.F.R. 40.51.
- d Comparison to both thresholds does not include fugitive emissions or mobile source emissions.
- e CO₂e calculated based on Global Warming Potentials in table A-1 IPCC AR6 table 7.SM.7 for 100-year time horizon.
- f GHG emissions related to off-site production of cement are considered indirect emissions and are not included in this table. Those emissions are quantified to be approximately 59,642 tons of CO₂e total.

Table 3.3.11-4. Estimated construction noise levels at selected receptors (source: staff).

Receptor	Activity	Noise Level (dBA L10)
Residence along Oak Hill Road	Upper Reservoir Excavation	42.0
	Upper Reservoir Lining	41.0
Residences along Rt. 14	Lower Reservoir Excavation	55.3
	Lower Reservoir Lining	51.1
Railroad Island Park	Lower Reservoir Excavation	46.1
	Lower Reservoir Lining	41.9

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APPENDIX C – STATUTORY AND REGULATORY REQUIREMENTS

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Federal Power Act

Section 18 Fishway Prescription

Section 18 of the Federal Power Act (FPA), 16 United States Code (U.S.C.) § 811, states that the Federal Energy Regulatory Commission (Commission) is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of the U.S. Department of Commerce or the U.S. Department of the Interior (Interior).

By letters filed May 23, 2022 and August 4, 2023, Interior requests that a reservation of authority to prescribe fishways under section 18 be included in any license issued for the project.

Section 10(j) Recommendations

Under section 10(j) of the FPA, 16 U.S.C. § 803(j)(1), each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions in any license issued unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

The Washington Department of Fish and Wildlife (Washington DFW), Interior, and National Marine Fisheries Service (NMFS) timely filed recommendations under section 10(j) on May 18, 2022, May 19, 2022, and May 23, 2022, respectively. NMFS and Interior filed revised 10(j) recommendations on June 6, 2023 and August 4, 2023, respectively. In section 5.3, *Fish and Wildlife Agency Recommendations*, we discuss how we address the agencies' recommendations and comply with section 10(j). Appendix H lists the recommendations filed pursuant to section 10(j), indicates whether the recommendations are included under the Staff Alternative, and includes the specifics of each recommendation's inconsistency and our determinations. 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 section 3.0, *Environmental Analysis*, and in section 5.1, *Comprehensive Development and Recommended Alternative*. In Appendix G, we discuss the basis for our additional measures or modifications to FFP's proposal and also explain why we did not recommend certain measures.

Clean Water Act

Under section 401(a)(1) of the Clean Water Act (CWA), 33 U.S.C. § 1341(a)(1), a license applicant must obtain either a water quality certification (WQC) from the appropriate state pollution control agency verifying that any discharge from a project would comply with applicable provisions of the CWA, or a waiver of such certification. A waiver occurs if the state agency does not act on a request for a WQC within a reasonable period of time, not to exceed one year after receipt of such request.

On June 24, 2020, FFP Project 101, LLC (FFP) applied to the Washington State Department of Ecology (Washington DOE) for a WQC for the project. On June 23, 2021, Washington DOE denied FFP's request without prejudice, citing a lack of sufficient information to make a decision. On May 23, 2022, FFP submitted a new request for certification, which Washington DOE received the same day. Washington DOE issued a WQC to FFP on May 22, 2023, and filed a copy of the WQC with the Commission on the same day. The conditions of the WQC are included in Appendix M and discussed in the specific resource sections of section 3.0, *Environmental Analysis*, in section 5.1, *Comprehensive Development and Recommended Alternative*, and in Appendix G.

Endangered Species Act

Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. On February 3, 2023, we accessed the U.S. Fish and Wildlife Service's (FWS) Information for Planning and Consultation database to determine whether any federally listed species could occur at the project. We accessed it again on December 7, 2023, to determine whether there if there were any updates to the list since the draft Environmental Impact Statement (EIS) was issued.¹ After reviewing the FWS's database as well as NMFS's public website, staff identified the following federally listed aquatic species that potentially occur in the Columbia River near the project: the endangered Upper Columbia River spring-run Chinook salmon (*Oncorhynchus tshawytscha*) evolutionary significant unit (ESU) and the Snake River sockeye salmon (*O. nerka*) ESU; and the threatened Lower Columbia River, Snake River fall-run, and Snake River spring/summer-run Chinook salmon ESUs; bull trout/Dolly Varden (*Salvelinus confluentus*); Columbia River chum salmon (*O. keta*) ESU; the Lower Columbia River coho salmon (*O. kisutch*) ESU; and the Lower, Middle, and Upper Columbia and Snake River steelhead (*O. mykiss*) distinct population segments (DPS).

The FWS's database also indicates that the endangered gray wolf (*Canis lupus*), the threatened yellow-billed cuckoo (*Coccyzus americanus*), the threatened North American wolverine (*Gulo gulo luscus*), the proposed threatened northwestern pond turtle (*Actinemys marmorata*)² and the candidate monarch butterfly (*Danaus plexippus*), may also be present in the project vicinity. There are no designated critical habitats for terrestrial species within the project area.

On March 31, 2023, we sent a letter to NMFS requesting concurrence that licensing the proposed 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

¹ See Interior's official lists of threatened and endangered species, accessed by staff using the IPaC database (<https://ipac.ecosphere.fws.gov>) on December 7, 2023, and placed into the records for Docket No. P-14861-002 the same day.

² After the draft EIS was issued, the FWS issued a rule on October 3, 2023, proposing to list the northwestern pond turtle as a threatened species under the ESA (see 88 FR 68370 68399).

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, and Columbia River chum salmon ESU. On the same day, we sent a letter to the FWS requesting concurrence that licensing the proposed project may affect, but is not likely to adversely affect bull trout and its critical habitat. In letters filed June 5 and June 6, 2023, NMFS and FWS responded that more information was needed regarding the timing of project water withdrawals and the likelihood of fish being entrained into the intake pool before the agencies could concur with staff's determinations.

Our analyses of project effects on threatened and endangered species are presented in section 3.3.5, *Threatened and Endangered Species*, and our recommendations in section 5.1, *Comprehensive Development and Recommended Alternative* and in Appendix G. Based on available information, we again conclude that licensing the proposed 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 habitats. Further, we conclude that licensing the project is not likely to jeopardize the proposed threatened northwestern pond turtle. Following issuance of the final EIS, we will seek NMFS's and FWS' concurrence with staff's updated determinations on listed salmon, steelhead, and bull trout as well as the proposed threatened northwestern pond turtle.

We conclude that licensing of the project would not affect the gray wolf because it is unlikely to occur or use the habitats surrounding the project and would not affect the cuckoo or wolverine because there no suitable habitat to support these species at the project.

Magnuson-Stevens Fishery Conservation and Management Act

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires federal agencies to consult with the Secretary of Commerce regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH) identified under the Act. There are four salmon ESUs not listed under the ESA that have designated 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. Our analyses of project effects on EFH are presented in section 3.3.5, *Threatened and Endangered Species*, and our recommendations in section 5.1, *Comprehensive Development and Recommended Alternative* and in Appendix G. Based on available information, we conclude that licensing the proposed project is not expected to adversely affect Chinook or sockeye salmon EFH.

Coastal Zone Management Act

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. §1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's

coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

Washington's coastal zone includes all lands (except for federal and Tribal lands) and waters within the state's 15 coastal counties but does not include Klickitat County where the project would be located. Oregon's coastal zone includes the state's coastal watersheds (except for federal and Tribal lands) and extends inland to the crest of the coast range, with a few exceptions (i.e., such as in the Columbia River Basin where the boundary extends upstream to Puget Island on the Columbia River, approximately 130 miles west of where the project would be located). Attachment 8 of FFP's November 20, 2020, response to additional information, includes emails from both Washington DOE and Oregon Department of Land Conservation and Development confirming that the project is not within Washington or Oregon's coastal zone boundaries and that CZMA would not apply to the Goldendale Pumped Storage Project.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties (TCPs), and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (National Register).

On March 21, 2019, Commission staff issued a notice stating that it was initiating consultation with the Washington State Historic Preservation Officer (Washington SHPO) and the Oregon State Historic Preservation Officer (Oregon SHPO), as required by section 106 of the NHPA and the implementing regulations found at 36 Code of Federal Regulations (C.F.R.) § 800.2. The notice also stated that the Commission was designating FFP as the Commission's non-federal representative for carrying out day-to-day consultation pursuant to section 106. Subsequent letters to the Washington SHPO and Oregon SHPO on August 13, 2021, reiterated that the Commission had designated FFP as its representative and authorized FFP to initiate consultation with the Washington SHPO, Oregon SHPO, appropriate Native American Tribes, and other consulting parties, pursuant to 36 C.F.R. § 800.2(c)(4). However, the letters also state that the Commission remains ultimately responsible for all findings, determinations, and government-to-government consultation.

To meet the requirements of section 106, the Commission intends to execute a Programmatic Agreement (PA) for the protection of historic properties from the effects of the construction, operation, and maintenance of the Goldendale Project. The terms of the PA would ensure that FFP addresses and treats all historic properties identified within the project's Area of Potential Effect (APE) through the finalization of a Historic Properties Management Plan (HPMP).

Pacific Northwest Power Planning and Conservation Act

Under section 4(h) of the Pacific Northwest Power Planning and Conservation Act, the Northwest Power and Conservation Council (NPCC) developed the Columbia River Basin Fish

and Wildlife Program to protect, mitigate, and enhance the operation of the hydroelectric projects within the Columbia River Basin. Section 4(h) states that responsible federal and state agencies should provide equitable treatment for fish and wildlife resources, in addition to other purposes for which hydropower is developed, and that these agencies should consider, to the fullest extent practicable, the program adopted under the Pacific Northwest Power Planning and Conservation Act. The NPCC has designated over 40,000 miles of river in the Pacific Northwest region as not being suitable for hydroelectric development (protected area). Because the project would be a closed-looped system that would not be continuously connected to any surface waters, the project would not be located on or develop a protected area; therefore, the protected area provisions of the program do not apply.

The program directs project proponents to consult with federal and state fish and wildlife agencies, appropriate Native American Tribes, and NPCC during the study, design, construction, and operation of any hydroelectric development in the basin. At the time the application was filed, our regulations required the applicant to consult with the appropriate federal and state fish and wildlife agencies and Tribes before filing, and after filing, to provide these groups with opportunities to review and comment on the application. FFP followed this consultation process, and the relevant federal and state fish and wildlife agencies and Tribes have reviewed the application.

To mitigate harm to fish and wildlife resources, NPCC has adopted specific provisions to be considered in the licensing or relicensing of non-federal hydropower projects (Appendix F of the Program). The specific provisions that apply to the proposed project call for: (1) consulting with fish and wildlife managers during study design, construction and operation of the project; and (2) ensuring that the project would not degrade water quality beyond the point necessary to sustain sensitive fish species.

Our recommendations in this EIS are consistent with the applicable provisions of the program, listed above. Further, a condition of any license issued would reserve to the Commission the authority to require future alterations in project structures and operations to take into account, to the fullest extent practicable, the applicable provisions of the program.

Wild and Scenic Rivers Act

Section 7(a) of the Wild and Scenic Rivers Act requires federal agencies to make a determination as to whether the operation of the project under a license would invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the designated river corridor. Public Law 99-663 (November 17, 1986) designated tributaries of the Columbia River as Wild and Scenic. The John Day River's confluence with the Columbia River is less than 3 miles up-river from the John Day Dam, located southeast from the proposed project area. This river system has designations under the National Wild and Scenic Rivers Act and the Oregon Scenic Rivers Act. Upstream of the project vicinity, sections of the Lower Deschutes River in Oregon are designated as a Wild and Scenic River. The Klickitat River in Washington, also a Wild and Scenic River, is more than 10 miles away from the project area. Its confluence with the Columbia River is approximately 28 miles downriver (west) of the project area. The project is not located on, nor would it directly affect, these designated river segments; therefore, it would have no effect on the values for which the river segments are designated.

Executive Orders 14008 and 12898

The U.S. Environmental Protection Agency's (EPA) environmental justice policies are directed, in part, by the recent Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*,³ and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*,⁴ as amended, which require federal agencies to consider if effects on human health or the environment from the programs, policies, or activities of federal agencies would be disproportionately high and adverse for environmental justice communities. The term "environmental justice community" could encompass: (1) populations of color; (2) communities of color; (3) Native communities; and (4) low-income rural and urban communities, which are exposed to a disproportionate burden of the negative human health and environmental effects of pollution or other environmental hazards.

In the final EIS, staff used updated data (i.e., 2022 U.S. Census American Community Survey data) and revised the analysis accordingly. Staff identified five environmental justice communities within a 5-mile radius of the project boundary and considered how the communities may be affected by changes in air quality, noise, aesthetics, and Tribal use from the construction and operation of the project. Except for the transmission line, project-related construction, operation, and maintenance activities would not occur in any environmental justice communities. Construction of the project transmission line would occur within Bonneville Power Administration's (BPA) right-of-way within environmental justice community Census Tract 9501, Block Group 2 in Sherman County, Oregon. Construction emissions would be temporary and minimized through appropriate control measures (e.g., dust control measures); therefore, project construction would have less than a significant impact on air quality in the environmental justice communities. Noise levels in environmental justice communities would be highest at residences in the immediate vicinity of construction activities and would diminish with distance from the work areas. Because the closest known residents to project construction within an environmental justice community are located in Rufus, Oregon, construction noise may be heard 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 a.m. to 6 p.m. 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. 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. The upper and lower reservoir, substation and overhead transmission line would be permanent introductions to the viewshed, adding to the existing industrial development in area (e.g., wind turbines, smelter, transmission lines, John Day Dam). FFP's proposed measures to reduce visual effects (e.g., use of vegetation screening, natural paint colors and surfacing materials that match

³ 86 *Federal Register* 7,619-7,633 (February 1, 2021).

⁴ 59 *Federal Register* 7,629-7,633 (February 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 its governing regulations and guidance, and statutory duty to evaluate all factors bearing on the public interest.

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. While the identified environmental justice (EJ) communities do not have a large Native American population, one of the five identified EJ communities are reported to contain American Indian populations and the area that would be occupied by the project has important historical value to the members of the Yakama Nation, Umatilla Tribes, and Nez Perce Tribe for traditional purposes such as food gathering and ceremonies. Project construction would result in the removal of 92.36 acres that could be used by the Tribes if they have access. 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 Tribal members would still need to work with adjoining private landowners to gain access.

Our analysis of the project's effects on these communities are presented in section 3.3.10, *Environmental Justice*. In consideration of the 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 not result in a disproportionately high and adverse effect on environmental justice communities. However, the effects would be temporary and 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).

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**APPENDIX D – ALTERNATIVES CONSIDERED BUT ELMINATED
FROM DETAILED ANALYSIS**

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Alternative Locations

Without elaboration, Columbia Riverkeeper, Sierra Club, and Washington Environmental Council, American Rivers, and the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation) recommend that the Commission consider alternative geographic locations for the project.

FFP Project 101, LLC (FFP) states in its license application that the proposed site was chosen due to the unique opportunity to re-use a previous industrial facility and the proximity to the John Day Substation and Bonneville Power Administration transmission lines. Additionally, Klickitat Public Utility District's existing pump station and conveyance pipes would supply water from an existing intake pool to the project without the need to construct a new intake, which FFP states would reduce the potential environmental effects of the project.

Our Analysis

The Commission does not design or site projects. Rather it determines whether a proposed project can be constructed and operated in a fashion that is the public interest and the best comprehensive use of the waterway. FFP did not consider any other sites for the reasons discussed above and no other sites have been recommended by another entity. Therefore, there is no basis on which to evaluate alternative site locations. Our environmental analysis considered FFP's proposal as well as measures recommended by stakeholders, including those that recommended operational design changes, or other measures designed to avoid or minimize impacts to specific resources.

Alternative Technologies

Columbia Riverkeeper, Sierra Club, and Washington Environmental Council recommended the Commission consider the following alternatives to pumped storage: (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. Commenters noted that "stacked blocks" refers to storing energy by automating a robotic crane to stack thousands of purpose-built, monoliths into a "Babel-like tower" and dropping them down again to release the power. "Liquid air" refers to cooling down air and storing it in pressurized aboveground tanks to be used for grid storage. "Underground compressed air" refers to using excess electricity to pump compressed air into a suitable underground formation that acts like a giant storage tank which can allow for electricity generation when the pressurized air is released.

Our Analysis

The Commission may issue licenses under the Federal Power Act for the construction, operation, and maintenance of non-federal hydropower projects. The Commission does not have the authority to authorize the specific types of energy storage technologies cited by Columbia Riverkeeper, Sierra Club, and Washington Environmental Council. However, we do consider alternative technologies in selecting the most likely alternative source of power for the Goldendale Project for purposes of our developmental analysis (see Appendix E).

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APPENDIX E – DEVELOPMENTAL RESOURCES

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POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

Table E-1 summarizes the assumptions and economic information used in the analysis. Most of this information was provided by the applicant in its license application. Some are developed by Commission staff. The values provided by the applicant are typically reasonable for the purposes of our analysis. If they are not, it is noted below. Cost items common to all alternatives include taxes and insurance costs; estimated capital investment required to develop the project; licensing costs; normal operation and maintenance cost; and Commission fees. All costs are adjusted to current year dollars.

Table E-1. Parameters for the economic analysis of the Goldendale Project (source: FFP, 2021a, as modified by staff).

Parameter	Value
Installed Capacity	1,200 megawatts (MW)
Average annual generation	3,561,000 megawatt-hours (MWh)
Period of analysis (years)	30
Federal tax rate	N/A
Local tax rate	N/A
Insurance, \$ ^a	N/A
Cost of money ^b	3.50%
Initial construction cost, \$ ^c	3,317,479,849
Application cost, \$ ^c	8,149,188
Operation and maintenance, \$/year ^c	238,838,043
Annual pumping costs ^d	\$130,410,000
Estimated Commission annual charges ^e	\$1,890,314
Alternative source of power's cost, \$/MWh ^f	181.70

^a Assumed included in operations and maintenance costs.

^b Assumed by staff.

^c Attachment 3 of Exhibit D, as modified by staff.

^d Calculated by staff based on 4,347,000 MWh/year pumping energy and off-peak energy value of \$30/MWh, as used in the calculation of levelized cost of storage.

^e Calculated by staff based on FERC administrative fees.

^f In keeping with Commission policy as articulated in Mead, we use the most likely alternative source of power's cost.

MOST LIKELY ALTERNATIVE SOURCE OF POWER

Staff selected lithium-ion storage batteries as a likely source of alternative power to the Goldendale Project because it is a storage technology which can offer, configured appropriately, comparable benefits to that of pumped storage. These benefits include providing large amounts of peak energy for periods up to 10 hours in duration, a quick response time in providing power, the ability to utilize renewable energy in production of peak energy thereby being considered a low-carbon technology, and a high efficiency in converting stored energy to usable power.

Staff estimated the cost of constructing and operating a lithium-ion battery storage facility sized similar to the Goldendale Project, (i.e., 1,200 MW), capable of providing up to 10 hours of peak energy daily, and generating an average of 3,561,000 MWh annually. Our cost is based on the levelized cost of storage (LCOS) for lithium-ion batteries as estimated by the U.S. Department of Energy in their 2022 report “2022 Grid Energy Storage Technology Cost and Performance Assessment”⁵ (DOE, 2022). Staff combined the cost of 1,000 MW of battery storage and 100 MW of storage as reported in DOE (2022) for year 2021, to get a combined cost of \$158/MWh for a 1,200 MW installation. This value was then adjusted to 2023 dollars, using the consumers price index, for a total cost of \$181.70/MWh.⁶

Because of the many variables which must be considered, the real cost of battery storage is difficult to estimate. Most battery costs estimates are based on small installations of 100 MW or less, which may be difficult to scale to larger installations. Some estimates may not consider the quickly changing cost of battery technology,⁷ may not consider recent costs of inflation, and often include only the cost of a one-time installation. The LCOS estimate in DOE’s 2022 report includes the complete cost of an energy storage system over its project life, including any major overhauls and replacements required to maintain operation. It also includes capital costs, taxes, financing costs, operations and maintenance, and performance metrics such as cycle life and calendar life. For lithium-ion batteries, the LCOS also considered decommissioning costs such as disconnection, site remediation, recycling, and disposal; however, DOE cautions that decommissioning costs are not highly developed at this time and may change as risks and environmental considerations change.

COMPARISON OF ALTERNATIVES

Table E-2 compares the installed capacity, annual generation, cost of alternative power, estimated total project cost, and difference between the cost of alternative power and total project

⁵ See Technical Report Publication No. PNNL-33283, August 2022; 2022 Grid Energy Storage Technology Cost and Performance Assessment, U.S. Department of Energy, Pacific Northwest National Laboratory.

⁶ Pumped-storage technologies are generally considered to be the lowest cost storage technology. For comparison purposes the estimated LCOS for a 1,200 MW pumped storage system in 2023 dollars is estimated to be \$121.9/MWh.

⁷ Lithium-ion battery systems have experienced significant cost declines over the last few years due to component cost declines, system integration improvements, and deployment advancements.

cost for each of the alternatives considered in this draft Environmental Impact Statement (EIS): No Action, FFP's Proposal, and the Staff alternative.

Table E-2. Summary of the annual cost of alternative power and annual project cost for the alternatives for the Goldendale Project (Source: staff).

	FFP's Proposal	Staff Alternative
Installed capacity (MW)	1,200	1,200
Annual generation (MWh)	3,561,000	3,561,000
Capacity benefit (MW)	N/A ^a	N/A ^a
Current alternative source of power's cost	\$647,033,700	\$647,033,700
Total annual project cost	\$553,693,655	\$553,761,921
Difference between the alternative source of power's cost and total annual project cost ^b	\$93,340,045	\$93,271,779

^a Captured in levelized cost of storage

^b This number denotes that the difference between the cost of alternative power and project cost is positive, thus the total project cost is less than the cost of alternative power.

No Action Alternative

Under the No Action Alternative, the project would not be constructed and would not produce any electricity. The only cost associated with this alternative would be the cost to prepare the license application.

Applicant's Proposal

FFP proposes numerous environmental measures, as presented in table F-1 in Appendix F. 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 is \$93,340,045 less than the alternative source of power's cost.

Staff Alternative

Under the staff-recommended alternative (i.e., Staff Alternative), the project would have a total installed capacity of 1,200 MW and an average annual generation of 3,561,000 MWh. Table F-1 in Appendix F shows the staff-recommended additions and modifications to FFP's proposed environmental protection and enhancement measures and the estimated cost of each.

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 \$553,761,921. Subtracting the total annual project cost from the alternative source of power's current cost, the project's cost to produce power and capacity is \$93,271,779 less than the alternative source of power's cost.

APPENDIX F – COSTS OF ENVIRONMENTAL MEASURES

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Table F-1. Costs of environmental mitigation and enhancement measures considered in assessing the effects of operating the Goldendale Project (Source: staff).

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$) ^a	Annual Cost (2023\$) ^a	Levelized Annual Cost (2023\$)
General				
1. Develop an adaptive management plan that coordinates post-licensing monitoring and adaptive management measures as necessary.	Columbia Riverkeeper, Sierra Club, and Washington Environmental Council	Unknown – the recommendation lacks sufficient detail on the monitoring and adaptive management measures to develop a cost	Unknown – the recommendation lacks sufficient detail on the monitoring and adaptive management measures to develop a cost	Unknown – the recommendation lacks sufficient detail on the monitoring and adaptive management measures to develop a cost
Geology and Soils				
2a. Develop a soil erosion and sediment control plan that includes FFP’s proposal to use dust palliatives to control fugitive windblown dust.	FFP; staff	\$110,597	\$0	\$6,013
2b. Include in the soil erosion and sediment control plan construction measures and BMPs consistent with WQC conditions. ^o	Washington DOE; staff	\$0 ⁿ	\$0 ⁿ	\$0

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
2c. Include the following fugitive dust control measures in the soil erosion control plan: (1) surface/roadway watering plan; (2) monitoring and response plan; (3) high wind speed threshold for halting material movement and processing; (4) roadway speed limits to limit dust entrainment; (5) haul truck cleaning and load covering requirements; (6) identify responsible officials and training procedures; (7) record keeping and reporting; schedules; and (8) contact information to report dust impact events.	EPA; staff	\$0 ⁿ	\$0 ⁿ	\$0

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
<p>3. Develop a construction vibration monitoring program which includes: (a) conducting a baseline survey and assessment of existing utilities; (b) developing a detailed map of existing utilities; and (c) developing a construction vibration monitoring plan with contractor requirements, and vibration criteria to be followed.</p>	<p>FFP; staff</p>	<p>\$814,919</p>	<p>\$0</p>	<p>\$44,308</p>
<p>4. Implement a Cleanup Action Plan for the West Surface Impoundment Plan with methods and procedures for excavating and disposing of contaminated soils and liner materials associated with the West Surface Impoundment.^o</p>	<p>FFP; Columbia Riverkeeper, Sierra Club, and Washington Environmental Council; Washington DOE; staff</p>	<p>\$11,758,115</p>	<p>\$0</p>	<p>\$639,304</p>

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
Aquatic Resources				
5. As part of the Draft Cleanup Action Plan, decommission 10 existing groundwater monitoring wells and install new groundwater monitoring wells.	FFP; Columbia Riverkeeper, Sierra Club, and Washington Environmental Council; staff	\$640,293	\$0	\$34,814
6. Implement a Spill Prevention, Control, and Countermeasure Plan. ^o	FFP; Washington DOE; staff	\$23,283	\$0	\$1,266
7. Implement a Dewatering Plan during construction. ^o	FFP; Washington DOE; staff	\$23,283 ^b	\$0 ^b	\$1,266
8. Implement a Reservoir Water Quality Monitoring Plan. ^o	FFP; Columbia Riverkeeper, Sierra Club, and Washington Environmental Council; Washington DOE; staff	\$34,925	\$2,328	\$4,227
9. Implement a Stormwater Pollution and Prevention Plan. ^o	FFP; Washington DOE; staff	\$23,283	\$0	\$1,266

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
10a. Include the intake pool and Klickitat PUD's intake and conveyance pipe that would connect to the new reservoir fill line in the project boundary and file revised project boundary exhibits.	Washington DFW; Interior	\$0 ^b	\$0 ^b	\$0
10b. Include the culvert in the railroad berm within the project boundary.	Interior	\$0 ^b	\$0 ^b	\$0
11a. Install and maintain fish screens on the Klickitat PUD intake works that meet NMFS and Washington DFW fish screening requirements.	Columbia Riverkeeper, Sierra Club, and Washington Environmental Council	Unknown. Costs would depend on engineering details that are not available	Unknown. Costs would depend on engineering details that are not available	Unknown. Costs would depend on engineering details that are not available

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
11b. Maintain Klickitat PUD's infiltration gallery and conform the structure to NMFS and Washington DFW fish screen criteria only if the currently installed infiltration gallery fails and needs repairs.	Washington DFW; Interior	Unknown. Costs would depend on engineering details that are not available	Unknown. Costs would depend on engineering details that are not available	Unknown. Costs would depend on engineering details that are not available
11c. File a written commitment in coordination with Klickitat PUD to screen any railroad berm culverts in a manner that conforms to NMFS' fish screening criteria prior to filling the reservoirs.	NMFS; Interior	\$0 for filing a written agreement. Costs to potentially screen the railway berm culvert(s) depends on engineering details that are not available.	\$0 for filing a written agreement. Costs to potentially screen the railway berm culvert(s) depends on engineering details that are not available.	\$0
11d. Conduct a fry and juvenile entrainment survey in the intake pool to inform the potential need for fish screening.	NMFS (contingent on whether a written agreement to screen the culvert is filed); Interior (contingent on whether a written agreement to screen the culvert is filed); American Rivers; Yakama Nation	\$75,000 ^c	\$0 ^c	\$4,078

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
11e. Develop a plan to monitor the effectiveness of the intake screen infrastructure and any screens that would be installed at railroad berm culverts.	Interior	Unknown. Depends on study design and parameters to be monitored as well as engineering details that are not available.	Unknown. Depends on study design and parameters to be monitored as well as engineering details that are not available.	Unknown. Depends on study design and parameters to be monitored as well as engineering details that are not available.
12a. Avoid withdrawing water from the Columbia River from April 1 to August 31 for initial fill. ^o	FFP; NMFS; Interior; Washington DFW; Washington DOE; American Rivers; staff	\$0 ^d	\$0 ^d	\$0
12b. Avoid withdrawing water from the Columbia River from April 1 to August 31 for annual refill.	NMFS; Interior; Washington DFW; American Rivers; staff	\$0 ^d	\$0 ^d	\$0

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
<p>12c. If refill is scheduled between April 1 and August 31 and the railroad culverts are not screened and no juvenile salmonid survey has been conducted, then develop a water flow and smolt monitoring plan prior to withdrawing water that contains methods for (1) monitoring flow rate of water into the culvert prior to and during withdrawals; (2) documenting smolts observed in and around the culvert; and (3) reporting results to the resource agencies.</p>	<p>Interior</p>	<p>\$25,000 ^p</p>	<p>\$0 ^p</p>	<p>\$1,359</p>
<p>13. Avoid releasing any effluent discharge into the Columbia River during project construction or operation.</p>	<p>NMFS; American Rivers</p>	<p>\$0 ^b</p>	<p>\$0 ^b</p>	<p>\$0</p>

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
Terrestrial Resources				
14a. Implement a Vegetation Management and Monitoring Plan that includes pre-construction surveys for sensitive and invasive plants, weed control, revegetation protocols, monitoring, and reporting.	FFP; staff	\$291,042	\$14,243	\$30,068

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
14b. Modify the Vegetation Management Plan to include: (1) pre-construction surveys for federal and state listed plants during the spring and early summer; (2) using shrubs and species of traditional cultural importance if they are available in the revegetation seed mix; (3) an integrated pest management approach to controlling noxious weeds; and (4) protocols for preventing and controlling wildfires during project construction and operation.	Interior; staff	\$20,000 ^b	\$0 ^b	\$1,087
14c. Consult with the affected Tribes when finalizing the Vegetation Management Plan.	American Rivers; staff	\$0 ^b	\$0 ^b	\$0

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
15. Implement a Wetland Mitigation and Planting Plan that includes establishing and rehabilitating a new stream on-site to mitigate for permanent impacts to federal jurisdictional stream S7 and S8; using BMPs to control erosion; revegetate disturbed areas with native seed mix; control noxious weeds; and monitoring revegetated areas for 10 years. ^o	FFP; Washington DOE; staff	\$50,000 ^e	\$10,000 for years 5-10 ^e	\$5,243

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
16a. Implement a Wildlife Management Plan that includes (1) an environmental training program; (2) biological monitoring during construction; (3) wildlife deterrent measures around the reservoirs (8-foot fencing, plastic shade balls, vegetation management); bird and mammal monitoring; (4) design transmission line to be raptor-safe; (5) 3 pre-construction raptor nest survey/monitoring events; and (6) acquire and manage 177 acres of conservation lands.	FFP; Washington DFW; Columbia Riverkeeper, Sierra Club, and Washington Environmental Council; staff	\$17,149,955 ^f	\$33,380 ^f	\$965,846
16b. Modify the Wildlife Management Plan to include surveying for peregrine falcons and ferruginous hawks in addition to other raptors identified in the plan.	staff	\$0 ^b	\$0 ^b	\$0

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
16c. Modify the Wildlife Management Plan to include conducting surveys for Dallas sideband snail, monarch butterfly and its preferred milkweed host plants, and juniper hairstreak butterfly prior to construction.	Washington DFW; Interior; staff	\$0 ^{bm}	\$0 ^{bm}	\$0
16d. Modify the Wildlife Management Plan to include conducting surveys for northwestern pond turtle prior to construction.	staff	\$0 ^{bm}	\$0 ^{bm}	\$0
16e. If the monarch butterfly or its host plants are determined to be present based on the pre-construction surveys, develop a monarch butterfly management plan that includes measures to protect the butterfly's habitat.	Interior; staff	\$10,000 ^b	\$0 ^b	\$544

<p>16f. Modify the Wildlife Management Plan to include a detailed bird and bat reservoir deterrent management plan that includes, in addition to FFP’s proposed measures, monitoring methods, metrics for evaluating the effectiveness of the deterrents in reducing the attraction of the project reservoirs to birds, bats, and other wildlife, criteria for deciding whether additional deterrents or modifications to the project are needed, and providing annual reports to resource agencies and Tribes. Monitoring efforts would include point count surveys for birds, acoustic monitoring for bats, and fatality searches for one year prior to construction and 2 years following deployment of deterrent measures.</p>	<p>Washington DFW; Umatilla Tribes, staff</p>	<p>\$10,000 ^g</p>	<p>\$20,000 for years 1-3 ^g</p>	<p>\$3,590</p>
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Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$) ^a	Annual Cost (2023\$) ^a	Levelized Annual Cost (2023\$)
16g. Complete a baseline study assessing effects to golden eagles and an annual study that assesses any increase in bird strikes above baseline that occur with reservoirs built and operating.	TID	\$20,000 ^h	\$20,000 ^h	\$21,087
16h. Modify the Wildlife management Plan to include a management plan for the 177-acre conservation lands that includes as appropriate noxious weed control, managing public access to avoid disturbing raptors, wildfire mitigation measures, fencing to protect and improve the habitat, and a wildlife water guzzler if there is an identified need for a source of water and procedures for updating the plan every 5 years.	Washington DFW; American Rivers; staff	\$130,000 ⁱ	\$2,000 every 5 years ⁱ	\$7,441

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
16i. 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.	Interior, Oregon DFW; staff	\$10,000 ^b	\$2,000 ^b	\$2,544
Recreation				
17. Install an interpretive sign at a location providing views of the project and is accessible to persons with disabilities.	FFP, staff	\$8,149	\$0	\$443
18. Develop a fencing and/or public safety plan.	FFP, staff	\$10,000 ^b	\$0 ^b	\$544

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
19. Coordinate construction schedules and associated road closures or delays with Washington DOT, Klickitat County, Corps, BIA, and Tribes to prevent interruption to recreational traffic.	FFP; staff	\$0 ^b	\$0 ^b	\$0
Land Use				
20. Complete independent wind studies to establish pre-construction baseline wind (e.g., wind speeds, direction, turbulence) and turbine energy production data, using data provided by Siemens and wind readings taken at each of TID's wind turbines and compare baseline data to post-construction data as part of an ongoing annual study.	TID	\$70,000 ^j	\$60,000 ^j	\$63,806

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$) ^a	Annual Cost (2023\$) ^a	Levelized Annual Cost (2023\$)
Cultural Resources				
21a. Implement a Draft HPMP filed on January 25, 2022 that includes conceptual measures developed by FFP for mitigating unavoidable adverse impacts to nine historic properties that would result from constructing, operating, and maintaining the project.	FFP	\$0 ^k	\$0 ^k	\$0

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
21b. Revise the January 25, 2022 HPMP in consultation with the Washington SHPO and participating Tribes to (1) include specific treatment measures for all affected archaeological sites (including research design and site-specific data recovery plans, including analysis, and recordation), curation, and construction site monitoring; and (2) survey the archaeological sites for burial grounds using trained dogs.	staff; Umatilla Tribes (for surveys using trained dogs)	\$700,000 ¹	\$15,000 ¹	\$53,060

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
21c. Develop a cultural resources management plan that includes all tribal recommendations and ensures Tribal member access to the area for gathering purposes is not hindered, encumbered, or otherwise interfered with.	Columbia Riverkeeper, Sierra Club, and Washington Environmental Council	Unknown. Cost cannot be estimated without knowing what might be required by the affected Tribes	Unknown. Cost cannot be estimated without knowing what might be required by the affected Tribes	Unknown. Cost cannot be estimated without knowing what might be required by the affected Tribes
22. Enforce existing Programmatic Agreement among BPA, Washington SHPO, and the Advisory Council on Historic Preservation for providing access to project lands for traditional root and plant gathering.	Yakama Nation	\$0. The Commission cannot require the enforcement of another agency's PA	\$0. The Commission cannot require the enforcement of another agency's PA	\$0. The Commission cannot require the enforcement of another agency's PA
Visual Resources				
23a. Develop a visual resources and recreation management plan that contains FFP's proposed visual resources protection measures.	FFP; staff	\$23,283	\$0	\$1,266

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$)^a	Annual Cost (2023\$)^a	Levelized Annual Cost (2023\$)
23b. Consult with the National Park Service and the Tribes in developing the visual resources and recreation management plan and include a provision in the plan to coordinate construction schedules and any associated road closures or delays on John Day Dam Road with Corps personnel at John Day Dam, BIA, and Tribal governments through the Columbia Inter Tribal Fish Commission	Interior; staff	\$0 ^b	\$0 ^b	\$0

Enhancement/ Mitigation Measures	Recommending Entities	Capital Cost (2023\$) ^a	Annual Cost (2023\$) ^a	Levelized Annual Cost (2023\$)
Traffic				
24a. Develop a traffic management plan containing applicable traffic control measures and protocols for coordinating construction schedules and any traffic control measures with Washington DOT and Klickitat County during project construction.	FFP, Klickitat County; staff	\$10,000 ^b	\$0 ^b	\$544

^a Unless otherwise noted, all cost estimates are from FFP’s license application or subsequent additional information request responses. We reviewed these costs and determined that they are reasonable estimates, and then escalated the costs to 2023 dollars.

^b Staff estimate.

^c Staff estimate includes capital costs for periodically surveying for anadromous salmonids (including fry/juveniles) within the intake pool during the salmonid smolt outmigration season.

^d Staff estimate. In the draft EIS, we stated this measure would likely delay filling of the reservoirs and the time that the project could begin generating by about 11 months and thus staff developed a cost for the lost generation in the first year (valued in the draft EIS at \$593,114.225). After the draft EIS was issued, FFP clarified in its June 6, 2023, filing that it already proposes to conduct the initial fill over two calendar years and would avoid the salmon migration window of April 1 through August 30 when conducting the initial fill. Based on this clarification, staff no longer anticipates this measure to result in a delay in FFP completing the initial fill or for the project to begin generating and thus there would be no costs for lost generation. Also, because FFP can successfully complete its larger initial fill outside of the April 1 through August 30 time period, we assume FFP would still be able to complete the smaller annual refill each year outside of this period as well so there would not be a significant annual cost associated with restricting annual refill to periods outside of April 1 through August 31.

- e Cost estimate includes \$50,000 capital cost for establishing and rehabilitating a new stream on-site to mitigate for permanent impacts to federal jurisdictional streams. Costs for erosion control, revegetation, noxious weed management, and 5 years of monitoring are already included under the vegetation management plan. However, the Wetland Mitigation and Planting Plan would add 5 additional years of monitoring at \$10,000 per year for years 5-10.
- f Capital costs include the following costs provided by FFP and escalated to 2023 dollars: \$23,062 for developing plan, \$11,531 for training program, \$23,9845 for biological monitoring, \$1,729,650 for reducing wildlife attractants (deterrents, shoreline management, etc.), \$5,766 for ongoing consultation, \$5,766 for initial reservoir monitoring, \$288,275 for fencing around reservoirs, \$13,837,200 for installing shade balls, \$172,965 for raptor-safe transmission line construction measures, \$46,124 for three pre-construction raptor nest surveys/monitoring, \$11,531 for migratory bird risk assessment literature review, \$5,766 for carcass removals, and \$609,400 for acquiring golden eagle compensatory wildlife mitigation lands. Annual costs include the following costs provided by FFP and escalated to 2023 dollars: \$5,766 for annual reservoir monitoring for bird and mammal use, and \$17,297 annual cost for shade balls maintenance.
- g Cost estimate includes \$10,000 capital cost for developing the bird and bat reservoir deterrent monitoring plan, and \$20,000 annually for first three years for bat surveys and fatality searches. Capital and annual costs for bird monitoring within reservoirs and installing and maintaining shade balls in the reservoirs are already included as part of the costs for FFP's proposed Wildlife Management Plan.
- h Cost estimate includes \$20,000 for initial baseline study and \$20,000 each year for the life of the license for ongoing yearly fatality searches and reporting results.
- i Cost estimate includes \$10,000 capital cost for developing the plan and \$120,000 capital cost for installing fencing and noxious weed control. The capital cost for acquiring the land and annual cost for maintaining the mitigation lands are already included in the costs for FFP's Wildlife Management Plan in measure 16a. The cost estimate also includes \$2,000 for updating the plan every five years.
- j Cost estimate includes \$70,000 for conducting wind study in first year (\$60,000 for wind study as reported by FFP plus another \$10,000 for obtaining additional information from wind turbine manufacturer and incorporating it into the study) and ongoing costs of \$60,000 for an annual study conducted each year of the license term.
- k Capital and annual costs for implementing the draft HPMP were not provided in the license application. An estimate to prepare and file the HPMP (\$750,000) was provided in the applicant's July 7, 2021, response to the Commission's request for additional information, but actual capital and annual costs for implementing the HPMP were not provided and are dependent on the final measures that are ultimately selected.
- l Staff estimate includes costs for (a) appropriate consultation to revise the draft HPMP (\$25,000); (b) curation (\$500,000); (c) Tribal monitoring during construction (\$150,000); and (d) searching for burial sites using dogs (\$25,000). Cost estimate does not include costs associated with mitigation of historic properties. Costs associated with HPMP implementation and specific mitigation measures are dependent on the final measures that are ultimately selected.

- ^m Cost included in the rare plant survey of item 16a.
- ⁿ Staff estimate assumes no additional costs to add these measures to the erosion and sediment control plan to be developed.
- ^o Mandatory Clean Water Act Section 401 water quality certification condition.
- ^p Staff estimate includes capital cost estimates of \$10,000 for developing the plan and \$15,000 for monitoring flow and smolt presence in and around the railway culvert during an approximate week-long refill period.

APPENDIX G – COMPREHENSIVE DEVELOPMENT

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As stated in Section 5.1, *Comprehensive Development and Recommended Alternative*, the following measures proposed by FFP would protect and enhance environmental resources and would be worth the cost:

Geology and Soils

- Develop a soil erosion and sediment 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.⁸
- Implement a Draft Cleanup Action Plan for the West Surface Impoundment that includes methods and procedures for excavating and disposing of contaminated soils and liner materials during construction of the lower reservoir.

Aquatic Resources

- Initially fill the project reservoirs between September 1 and March 31 to prevent project-related flow reductions in the Columbia River that could delay salmon smolt migration.
- As part of the proposed Draft Cleanup Action Plan, decommission 10 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 Department of Ecology (Washington DOE).
- 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 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 includes procedures for annually monitoring and reporting on water quality in the project

⁸ 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.

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 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 and Planting Plan⁹ 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 streams labeled 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;¹⁰ (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 on-site to reduce wildlife collisions.
- To mitigate for the permanent loss of wildlife habitat, work with FWS and Washington Department of Fish and Wildlife (Washington DFW) to select and purchase 277 acres¹¹ 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 as part of the proposed 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

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.

¹⁰ 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.

¹¹ 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.

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 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) filed on January 25, 2022, 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 the footprints of aboveground features to the furthest extent reasonably practicable; (3) ensure facilities are free of debris and store unused or damaged equipment off-site 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 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 traffic control measures identified in consultation with Washington DOT and Klickitat County to minimize disruption of traffic on public roads during project construction.

As stated in Section 5.1 under the staff alternative, the project would be constructed and operated with FFP's proposed measures identified above, the conditions required by the Washington DOE Clean Water Act section 401 water quality certification (WQC) included in Appendix M,¹² and staff's recommended modifications and additional measures described below.¹³

Geology and Soils

- Ensure that the proposed soil erosion and sediment control plan contains construction measures and BMPs consistent with WQC conditions G.1, G.2, G.3, G.5, G.6, G.7, G.8, G.9, G.10, G.11, and G.16.¹⁴
- Include the following fugitive dust control measures in the soil erosion and sediment control plan: (1) a surface/roadway watering plan; (2) a monitoring and response plan to identify and address periods of significant dust emission; (3) a provision to identify a threshold high windspeed to stop material movement and processing to prevent significant dust emission events; (4) roadway speed limits to limit dust entrainment; (5)

¹² The WQC conditions require FFP to file finalized plans for Washington DOE's approval (i.e. Dewatering Plan, Stormwater Pollution and Prevention Plan, Cleanup Action Plan for the West Surface Impoundment, Spill Prevention Plan, Water Quality Monitoring Plan, Wetland Mitigation and Planting Plan). These finalized plans will also need to be filed for Commission approval before construction can begin.

¹³ If Klickitat PUD's existing water pump station, infiltration gallery, conveyance pipe, and water supply vault are determined by the Commission to be licensed project works, then FFP could be required to enclose these facilities within the project boundary, file updated project boundary exhibits, and maintain these facilities for the term of any license issued. If a license is issued, a project boundary determination will be made in the license order.

¹⁴ The WQC conditions require erosion and sediment control measures such as marking all clearing limits, stockpiles, staging areas, and trees to be preserved prior to construction and ensuring stock piles and staging areas are located a minimum of 25 feet from wetlands and surface waters; installing high visibility construction fencing around environmentally sensitive areas (such as wetlands, wetland buffers, riparian buffers, and mitigation areas); using seed mixes consisting of native, annual, and non-invasive plant species; disposing excavated sediment in approved upland disposal sites; re-introducing water into mitigation stream channels gradually at a rate not higher than the normal flow; not using hay or straw on exposed or disturbed soil at mitigation site(s), etc. See Appendix M for the list of the conditions.

haul truck cleaning and load covering requirements; (6) responsible officials and training procedures; (7) record keeping and reporting schedules; and (8) community/citizen reporting forms/phone-line and contact information to report dust impact events.

Terrestrial Resources

- Modify the proposed Vegetation Management and Monitoring 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 (identified in consultation with the Tribes) 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) provisions to conduct pre-construction surveys for peregrine falcons and ferruginous hawks (in addition to surveying other raptor species already identified in the plan); (2) provisions to conduct pre-construction surveys for Dalles sideband snail, northwestern pond turtle, monarch butterfly and its preferred milkweed host plants, 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, criteria for deciding whether additional deterrents or modifications to the project are needed, and a schedule for filing monitoring reports with the U.S. Fish and Wildlife Service (FWS), Washington DFW, Oregon Department of Fish and Wildlife (Oregon DFW), Confederated Tribes and Bands of the Yakama Nation (Yakama Nation), Confederated Tribes of the Umatilla Indian Reservation (Umatilla Tribes), Confederated Tribes of the Warm Springs Reservation of Oregon (Warm Springs Tribes), and Nez Perce Tribe; 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.
- If the monarch butterfly or its host plants are determined to be present based on the pre-construction surveys, develop a monarch butterfly management plan that includes measures to protect the butterfly's habitat, such as fencing off occupied areas or including milkweed in its revegetation seed mix.
- 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.

Threatened and Endangered Species

- Limit initial fill and periodic refill of the project reservoirs to between September 1 and March 31 to minimize project-related flow reductions in the Columbia River that could delay salmon smolt migration.

Recreation Resources

- Develop the visual resources and recreation management plan in consultation with the National Park Service and Tribes and include a provision in the plan to coordinate construction schedules and any associated road closures or delays on John Day Dam Road with U.S. Army Corps of Engineers (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 proposed HPMP to include specific treatment measures for all affected archaeological sites and traditional cultural properties (TCP). 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 specific 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; (3) surveying the archaeological sites using specially trained canines for historic and prehistoric human remains detection to minimize the potential for disturbing any undetected burial sites; and (4) 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.

Below we discuss the basis for our additional measures or modifications to FFP's proposal. We also explain why we did not recommend certain measures.

Project Boundary Considerations and Additional Measures Recommended by Staff

Project Boundary

FFP proposes to obtain water to fill and refill the reservoir by purchasing the water from Klickitat Public Utility District (Klickitat PUD). The water would come from an existing intake pool formed by a railroad berm adjacent to the Columbia River about two miles south and east of the proposed lower reservoir site. Within the intake pool, Klickitat PUD operates an intake pump station consisting of an infiltration gallery containing six vertical pumps installed in perforated casings surrounded by gravel. Water seeps through the gravel to the pump casings where it is pumped up and conveyed to the former smelter site via an existing two-mile long industrial water conveyance line also owned by Klickitat PUD. FFP would interconnect the

project's water fill line with Klickitat PUD's existing piping infrastructure within Klickitat PUD's water supply vault near the lower reservoir. Washington DFW and Interior recommend pursuant to section 10(j) that the intake pool as well as Klickitat PUD's existing pump station and water conveyance system be included within the project boundary because they are necessary for operation and maintenance of the project. Additionally in comments on the draft EIS, Interior recommends that the intake pool as well as the culvert within the railroad berm also be included within the project boundary.

In its reply comments and in comments filed on the draft EIS, FFP states Klickitat PUD's facilities are existing, multi-use facilities currently supporting other uses in Klickitat County and would be unrelated to the project. Thus, FFP maintains that Klickitat PUD's pump station and the intake pool are not project facilities and should remain outside of the project boundary. Klickitat PUD clarified in comments filed on the draft EIS that it currently serves one agricultural customer and one industrial customer at the former smelter site but that in addition to these customers and FFP, it anticipates serving other water system customers in the future consistent with its 2011 Cliffs Water System Plan and continues to oppose having any of its facilities included within the project boundary.¹⁵ Klickitat PUD also clarified in comments on the draft EIS that the railway berm containing the culvert is owned by the Burlington Northern Santa Fe (BNSF) railway company.

If a license is issued, a project boundary determination will be made in the license order.

Erosion and Dust Control

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. 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 minimize the potential for soil erosion during construction, FFP proposes to implement a Draft Stormwater Pollution and Prevention Plan and develop an erosion and sediment control plan that would include BMPs 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. FFP would also include measures to control windblown dust and soil, such as periodic watering of surface roads, applying dust palliatives to disturbed areas, and covering haul trucks transporting soil, sand, or other loose material on the site.

Since the issuance of the draft EIS, Washington DOE issued a WQC for the project that includes conditions to control erosion and monitor the effectiveness of control measures. Specifically, the WQC conditions require FFP to: (1) finalize and submit for agency approval the Stormwater Pollution Prevention Plan; (2) ensure construction stormwater, sediment, and erosion control BMPs are in place before starting construction and are maintained throughout the duration of the activity; (3) where seeding is used for temporary erosion control, use a seed mix

¹⁵ See Klickitat PUD's letter dated May 12, 2020, filed as appendix K to FFP's license application. A copy of the 2011 Cliffs Water System plan was included with the letter. See also Klickitat PUD's letter commenting on the draft EIS filed on June 7, 2023.

consisting of native, annual, non-invasive plant species; (4) locate stock piles and staging areas a minimum of 25-feet, from waters of the state, including wetlands and their buffers; (5) implement protective measures to avoid escaping or leaching of dust associated with trucks hauling soil or contaminated media off-site; and (6) dispose of all excavated sediment at an approved upland disposal site.

In addition, in comments on the draft EIS, EPA recommends that the fugitive dust control component of the proposed erosion and sediment control plan include: (1) a robust surface/roadway watering plan, possibly including chemical dust control and/or gravel roadway cover if necessary; (2) a robust monitoring and response plan to identify and address periods of significant dust emission; (3) a threshold high windspeed to stop material movement and processing to prevent significant dust emission events; (4) roadway speed limits to limit dust entrainment; (5) haul truck cleaning and load covering requirements; (6) identification of responsible officials and training procedures; (7) record keeping and reporting schedules; and (8) community/citizen reporting forms/phone-line and contact information to report dust impact events.

Our analysis in section 3.3.1.2 *Geology and Soils, Environmental Effects*, concludes that the BMPs that FFP proposes along with the additional detailed measures required by the WQC and recommended by EPA are consistent with industry standards for erosion and sediment control and would minimize the effects of soil disturbance on sensitive terrestrial and aquatic resources. Additionally, the details required by the WQC and recommended by EPA would make the erosion and sediment control plan and Stormwater Pollution and Prevention Plan more robust and improve monitoring and reporting requirements. Therefore, we recommend that the erosion and sediment control plan include EPA's recommended dust control measures and that the erosion and sediment control plan and Stormwater Pollution Prevention Plan include erosion control measures consistent with the WQC.

Timing of Water Withdrawals

The proposed construction and operation of the Goldendale Project would require 7,640 acre-feet of water to initially fill the upper and lower reservoirs. Annual refill in the amount of 360 acre-feet would be needed to make up for evaporation and leakage. Instead of constructing a new water supply infrastructure, FFP proposes to purchase the needed water from Klickitat PUD, which would be withdrawn from the Columbia River and delivered to the project via Klickitat PUD's pump station and existing piping infrastructure. Klickitat PUD withdraws water from an intake pool hydrologically connected to the Columbia River approximately two miles south and east of the project. Water from the Columbia River enters the intake pool via seepage through an existing railroad berm but can also enter via at least one existing unscreened 120-foot-long, 42-inch-diameter culvert that runs through the berm. The water purchased for the Goldendale Project would not require Klickitat PUD to obtain new appropriations of water from the Columbia River as they would be purchased under Klickitat PUD's existing water right, which currently would permit FFP to draw no more than 4,137 acre-feet of water in any calendar year at an average delivery rate of 21 cfs up to a maximum rate of 35 cfs. As a result, FFP proposes to complete the initial fill over a 7-month period spanning two calendar years (i.e., between

September 1 and March 31).¹⁶ FFP does not propose a schedule or time window for refilling the reservoirs each year, but states that it has flexibility to conduct the refill once per year or through multiple shorter withdrawals throughout the year.

In its revised 10(j) recommendations filed June 6, 2023, the National Marine Fisheries Service (NMFS) recommends that FFP not withdraw water from the Columbia River for initial fill or annual refill at any time from April 1 through August 31 to ensure sufficient Columbia River flows for outmigrating juvenile salmonids and to reduce the likelihood of fish entrainment into the intake pool during the peak spring and summer smolt migration period. NMFS reasons that Columbia River flows have been greatly diminished by a host of human activities and further reductions in spring/summer Columbia River flows would increase the time and energy it would take for juvenile salmonids to migrate downriver to ocean habitat, which increases their exposure to native and nonnative predators and reduces their survival rates. Further, NMFS believes that the “likelihood of entrainment (stranding and/or predation) [in the intake pool] and ‘take’ would be substantially reduced” if project water is not withdrawn during the peak smolt migration period. In comments on the draft EIS, Interior, American Rivers and Washington DFW support NMFS’ seasonal water withdraw restriction for both initial fill and refill. Additionally, the WQC requires FFP to conduct its initial fill over two calendar years but does not stipulate a time window for the initial fill or refill.

After the issuance of the draft EIS, FFP agreed not to withdraw water from the Columbia River for initial fill any time from April 1 to August 31; however, it opposes a requirement that places a timing restriction on refilling the reservoirs, FFP asserts that the proposed project should not be restricted by the annual withdrawal limits because the water used to fill and refill the reservoirs would be purchased from Klickitat PUD; Klickitat PUD’s diversion of water and its exercise of its existing water right are not attributable to the proposed project and cannot be considered an effect of the project because Klickitat PUD could continue to exercise its water right whether the project could or could not use water during the defined timeframe; and the amount of water withdrawn by the project is negligible so the refill withdrawals would not impact salmon and trout.

Our analysis in section 3.3.3.2, *Fisheries Resources, Environmental Effects*, shows that the majority (i.e., 90 percent of detections) of juvenile Endangered Species Act (ESA)-listed anadromous salmonids migrate past the project from April through August each year. If FFP were to receive water withdrawn by Klickitat PUD to fill the reservoirs during these months, the maximum rate at which FFP would receive the water (i.e., 35 cfs) represents approximately 0.03% of the median flow in the Columbia at the location Klickitat PUD would withdraw the water and 0.08% of the lowest Columbia River flow on record at this location. 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 River at this gage in a 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

¹⁶ FFP updated its proposal for conducting the initial fill of the project reservoirs in its comments on the draft EIS filed on June 6, 2023.

0.001% of the minimum volume of water passing through at this location based on the period of record. Nonetheless, avoiding water withdrawals for initial fill during the peak salmonid smolt migration period as recommended by the resource agencies and American Rivers and agreed to by FFP would prevent the project from contributing (albeit negligibly) to reductions in Columbia River flows which could delay migrating salmon smolts and reduce potential fish entrainment into the intake pool where salmon smolts could be lost to predation (as discussed further below).

In its application, FFP states that it has some flexibility in the timing of annual refills, indicating that refills could occur once per year, or over multiple, shorter withdrawals per year, depending on site conditions. We estimate that it would take about 8.6 days to refill the reservoir with 360 acre-feet at 21 cfs (projected average annual refill rate). Given FFP's stated flexibility in refilling the reservoirs and the short time that would be needed to complete the refill, avoiding refilling the reservoirs during the peak smolt migration period should not pose a significant problem to project operation and would prevent project-related reductions in Columbia River flows during the peak smolt migration period.

For these reasons, staff recommend FFP limit filling and refilling the project reservoirs between September 1 and March 31.

Rare Plant Surveys

Project construction would temporarily disturb 54.3 acres of vegetation and remove 193.6 acres (see table 3.3.4-5 in Appendix B). Some of the habitats that would be disturbed 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 when they all would have been identifiable. In its draft Vegetation Management and Monitoring Plan, FFP proposes to 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. Interior recommends, pursuant to section 10(j), that the surveys be conducted in both upland shrub-steppe and riparian areas, that the surveys 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 identified, and that all sensitive plants be documented and avoided.

FFP does not specify when its pre-construction surveys would be conducted, but states that it would cover all disturbed areas, which include both shrub-steppe and riparian habitats referenced by Interior. Conducting pre-construction surveys in the spring and early summer would improve the probability of identifying sensitive plants and defining measures that would avoid or minimize those effects as proposed by FFP. Because FFP does not specify the frequency of its proposed surveys, we cannot tell how much additional effort would be needed to conduct two surveys relative to FFP's proposal. Assuming FFP only proposes one survey, we estimate it would cost \$20,000 (\$1,087 annualized) for the additional survey and find that the benefits of identifying and protecting these rare plants to be worth the added cost. Therefore, we recommend that the Vegetation Management Plan be modified to specify that FFP shall survey

for both state and federal listed plants twice, once in the spring and once in the summer prior to beginning construction.

Revegetation and Wildfire Control

As part of its draft Vegetation Management and Monitoring Plan, FFP proposes to 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). Interior recommends that FFP use a native seed mix that includes species from locally adapted plants and that Washington DFW, Washington Natural Heritage Program (Washington NHP), and Oregon DFW be consulted prior to replanting to confirm the appropriate seed mix. Interior also recommends supplementing the revegetation effort with supplemental plantings of containerized plants or bareroot nursery stock (including plants of cultural or spiritual importance) if available. Interior also recommends including in the plan fire suppression measures that would be implemented during construction and operation to minimize potential damage to wildlife habitat. FFP does not propose any fire suppression measures in its application. American Rivers recommends that FFP consult with affected Tribes when developing and finalizing its Vegetation Management and Monitoring Plan.

The seed mix proposed by FFP includes grasses and forbs used locally by the U.S. 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. Because FFP has not finalized its seed mix, consulting with resource agencies and Tribes on the appropriate seed mix and including shrubs and culturally important plants if available in its revegetation efforts would have a nominal additional cost and should be included in the plan.

The arid environment and increasing probability of drought 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. Including such protocols in the plan is prudent and would not increase the cost of revising the plan. Therefore, we recommend that FFP include wildfire control measures in its Vegetation Management and Monitoring Plan.

We estimate that staff's additional measures would increase the cost of FFP's proposal by \$20,000 (\$1,087 annualized) and find that the benefits of protecting rare plants and replacing plants with importance to the Tribes to be worth the cost.

Pre-Construction Wildlife Surveys

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. Based on the surveys, FFP would develop 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 nest, depending on the species), and monitor any documented nests to ensure construction activities avoid disturbing the nests.

Prairie falcons are known to nest on the steep bluffs between the proposed upper and lower reservoirs and ferruginous hawks are known to inhabit lands in and around the project site. Disturbance during construction could cause nest abandonment or reduce the survival of young if present. Including prairie falcons and ferruginous hawks in its survey efforts would not increase survey costs because they could be looked for during FFP's proposed survey efforts. Therefore, we recommend that FFP also survey for prairie falcons and ferruginous hawks and develop appropriate mitigation and monitoring measures for nesting prairie falcons and ferruginous hawks.

Pre-Construction Surveys for Dalles Sideband Snail, Northwestern Pond Turtle, Juniper Hairstreak, and Monarch Butterfly

Washington DFW recommends 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 conduct surveys for these species. In comments on the draft EIS, Interior recommends that FFP conduct pre-construction surveys for the monarch butterfly and its habitat and if individual butterflies or its host milkweed plants are found, work with the FWS and any other relevant resource agencies to develop a "monarch management plan" that includes mitigation for impacts to milkweed habitat.

Both the Dalles sideband snail and juniper hairstreak butterfly are candidates for state-listing in Washington. Habitat in the Columbia Basin for these species 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. Habitat for both species could be affected by constructing the upper reservoir.

The monarch butterfly is a candidate for listing under the Endangered Species Act and its distribution includes the project area. It is unknown whether habitat for the butterfly would be disturbed during project construction.

Staff's updated review of FWS's Information for Planning and Consultation (IPaC) database indicates that northwestern pond turtle, a federally proposed threatened species, may be found in shoreline and upland habitats along the Columbia River and Columbia River Gorge

including the project. While there is no documentation of northwestern pond turtles in the areas to be disturbed it is possible that habitat for the species could be affected by construction.

Surveying for these sensitive wildlife species prior to 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. These surveys could be done at the same time as the rare plant surveys discussed above, therefore, there would be no additional cost to look for these sensitive species in conjunction with the rare plant surveys if the field crew is trained to look for them. Therefore, we recommend that FFP survey for Dalles sideband snail, northwestern pond turtle, juniper hairstreak butterfly, and monarch butterfly and its milkweed host plants prior to beginning construction and file a report with any recommended measures for their protection, if needed.

Additionally, if ESA-candidate monarch butterflies or its preferred milkweed hosts are found in areas to be disturbed as a result of the surveys, then developing a monarch butterfly management plan in consultation with the resource agencies as recommended by Interior would allow FFP to identify actionable steps to protect the butterfly's habitat, such as fencing off occupied areas or including milkweed in its revegetation seed mix. We estimate the levelized cost of developing such a plan would be \$544 and find that the benefits of protecting sensitive monarch butterflies and their habitat to be worth the cost.

Wildlife Habitat Management for the Mitigation Lands

To mitigate for the permanent loss of wildlife habitat, FFP proposes to work with FWS and Washington DFW to select and purchase 277 acres¹⁷ off-site lands and manage the land to provide golden eagle nesting and foraging 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. FFP states it 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 Washington DFW land.

Washington DFW recommends the development of a management plan for the mitigation lands and that the plan be approved by Washington DFW and FWS and be updated every five years to reflect new information, new management needs, and updated implementation strategies. Washington DFW states that the plan should include measures to control noxious weeds, manage public access to avoid disturbing raptors, wildfire mitigation 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

¹⁷ 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.

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.

Acquiring and managing 277 acres of off-site land for the benefit of golden eagles that meet the criteria proposed by FFP would offset the permanent loss of eagle foraging and nesting habitat at the project. FFP estimates it would cost \$609,400 to acquire the land (FFP's costs escalated to 2023 dollars) and \$10,000 per year to manage the land. While FFP's estimated costs for acquiring the land seem reasonable, until the parcel(s) are identified, and the habitats evaluated, it is not possible to determine what specific habitat management would be needed to achieve the intended purposes or to accurately estimate the costs for implementing the measures. 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, fencing, and installing a wildlife water guzzler as recommended by Washington DFW. We estimate that initial site habitat improvements will likely be higher than that estimated by FFP, but \$10,000 per year for management thereafter may be reasonable. Updating the plan every 5 years based on new information and changing conditions is also prudent.

Therefore, we recommend that FFP develop a management plan for the parcel(s). The management plan should identify the parcel(s) to be acquired, the habitat values of the land, the specific land management objectives, and the habitat improvements that would be implemented on the parcel(s). To continue to meet its objectives, the land would need to be monitored and management objectives and treatments updated periodically. Therefore, we also recommend including in the management plan, a schedule for reviewing and updating the plan. We estimate the initial habitat improvement costs and to prepare the plan with staff modifications would cost \$130,000 more than FFP's estimated cost. We find the benefits of managing these lands for golden eagles to be worth the annualized cost of \$7,441.

Wildlife Deterrent Management Plan

Washington DFW, Interior, EPA, Yakama Nation, and Turlock Irrigation District (TID) are concerned that constructing the upper and lower reservoir FFP would create 124 acres of open water that could attract waterfowl and waterbirds which are prey for golden eagles and other raptors, and a water and prey source for bats. The increased attraction to the reservoirs could in turn expose golden eagles and other raptors and birds to increased mortality from wind turbine strikes and bats to increased mortality from strikes and barotrauma.

FFP proposes to reduce the attraction of the project reservoirs to wildlife by (1) installing a chain link fence that is at least 8 feet high around the reservoirs to prevent animals from gaining access to the reservoirs; (2) marking all fences with vinyl strips and/or reflective tape to reduce avian collision risks; (3) preventing the establishment of vegetation around the reservoirs to reduce their attraction to wildlife; (4) covering 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; (5) monitoring for and removing carcasses of livestock and other animals from the project area that may attract scavenging wildlife, foraging eagles, or other raptors; (6) developing a monitoring program to identify bird and mammal usage of the reservoirs and

measure the effectiveness of wildlife deterrents; and (7) developing an reporting system to document wildlife mortalities, injuries, nuisance activity, and other interactions.

Washington DFW is supportive of the protection measures proposed in FFP's Wildlife Management Plan, but recommends pursuant to section 10(j), that a specific 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 include the measures proposed by FFP but would also include monitoring bird and bat use of the reservoirs before and after deploying deterrents. Monitoring information would be used to decide to maintain, increase, modify or explore other options of deterrents. An 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. Because of the importance of bald and golden eagles to the Tribes, the Umatilla Tribes request to receive any monitoring reports. TID recommends that that a new 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.

The new project reservoirs would be constructed in an area that supports eagles and other raptors and is located near the John Day Waterfowl Area. 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 some data that shows that the use of shade balls reduces the attraction of birds to surface waters, but there is no information how effective they might be to deter bats.

FFP proposes to monitor bird usage of the reservoirs and measure the effectiveness of bird deterrents but does not propose to monitor bat use or address bat mortality from the wind turbines. FFP does not propose any monitoring methods.

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 whether there was a change in bird use. Taking steps to deter waterfowl and raptors from using the project reservoirs is prudent, particularly 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 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. Therefore, if bird use increases, further monitoring of avian interactions with the adjacent wind turbines may be needed to determine whether 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, the Commission does not have the authority to require access across non-project lands to conduct the searches and so permission from the landowner would be needed to access those lands. In the alternative, FFP could consult with the landowner on any observed mortalities on their land.

The current use of the project site by bats and the current mortality rates of bats from the wind turbines is unknown. Bats appear to be attracted to wind turbines for a variety of hypothesized reasons, including auditory, heat, and insect abundance.¹⁸ However, the reasons for such attraction are not known and could be for reasons other than foraging (De Jong et al., 2021). In addition, the project reservoirs could attract bats and increase their risk of collision with nearby wind turbines. 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 whether 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 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 whether the rate of mortality increases because of the new reservoirs and is significant enough to require further mitigation measures. Conducting bat mortality searches such as those done by Smallwood and Karas (2009) on project lands would aid in that determination. Again, because the Commission does not have the authority to require access to non-project lands to conduct such searches, in the alternative, FFP could consult with the landowner on any observed mortalities on their land.

An effective monitoring plan would need to include methods for documenting bird and bat use before and after constructing and filling the reservoirs, metrics for evaluating the effectiveness of the deterrents in reducing the attraction of the project reservoirs by birds, bats, and other wildlife, criteria for deciding whether additional deterrents or modifications to the project are needed, and a schedule for filing monitoring reports with FWS, Washington DFW, Oregon DFW, Yakama Nation, Umatilla Tribes, Warm Springs Tribes, and Nez Perce Tribe. We estimate that modifying the wildlife management plan to include a detailed wildlife deterrent management plan that includes one year of pre-construction surveys for birds and bats and two years of surveys following the start of project operation with the proposed deterrents in place would have an annualized cost of \$3,590. The survey methods should include acoustic monitoring to monitor bat species and point count surveys to monitor bird species. It should also include consulting with the TID on any bird and bat fatality observed at the wind farm. We conclude the benefits of the efforts in protecting golden eagles and bats are worth the cost.

These efforts should be sufficient to determine whether the project is causing an increase in risk to eagles without requiring developing a baseline study and conducting annual monitoring

¹⁸ See article titled Why Bats Are Insanely Attracted to Wind Turbines?. Available online at: <https://electrical-engineering-portal.com/why-bats-are-insanely-attracted-to-wind-turbines#:~:text=9%20Hypotheses%20for%20Bat%20Attraction%20to%20Wind%20Turbines,8%208.%20Forest%20Edge%20Effect%20...%20More%20items>. Accessed March 22, 2023.

for the life of the license as recommended by TID at an annualized cost of \$21,087. However, a potential outcome of the initial monitoring efforts could be recommendations for further monitoring.

Avian Protection Measures for the Project Transmission Line

The project would require constructing a 3.13-mile-long, overhead 500-kV transmission line. 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 BPA's existing poles so that 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. 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 proposes to construct consultation with the FWS and Washington DFW. Any new poles and lines will be designed with appropriate conductor spacing and visibility enhancement devices.

Interior recommends pursuant to section 10(j) that FFP develop an avian protection plan that requires constructing transmission structures according to bird protection standards and guidelines consistent with *Avian Protection Plan Guidelines* (APLIC, 2005), *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* (APLIC, 2012). Oregon DFW also recommends developing an avian protection plan that includes measures for documenting and reporting bird mortality and addressing problem poles.

FFP's proposed construction design measures are already consistent with these guidelines. However, FFP's measures do not include measures for documenting and reporting bird mortality and addressing problem poles. Developing an avian protection plan that includes monitoring and reporting procedures and addressing identified problem poles would be consistent with APLIC guidelines and better protect birds from electrocution and collision hazards. We estimate it would cost \$2,544 (annualized) to develop this plan and find that the benefits are worth the cost.

Recreation and Visual Resources Management Plan

Construction-related traffic would increase the volume of traffic on John Day Dam Road, which could create some delays for those recreationists trying to reach Corp's Cliffs Park and Railroad Island Park, Tribal members trying to reach a BIA treaty fishing access site next to the Corps Railroad Island boat launch, and Corp personnel trying to reach or leave John Day Dam via this road. FFP proposes as part of its recreation and visual resources management plan 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."

In comments submitted on the draft EIS, Interior states that the project is located along and crosses portions of the Lewis and Clark National Historic Trail and the "Auto-Tour Route"

for the trail (specifically State Route 14 in Washington along the north side of the Columbia River and Interstate 84 in Oregon along the south side of the Columbia River). To minimize potential visual and recreational impacts to the trail, Interior recommends that FFP develop its visual and recreation resource management plan in consultation with the National Park Service. Interior states that park service staff can advise FFP on textures, lines, colors, and forms of project components to minimize negative impacts to the Lewis and Clark National Historic Trail and has expertise with respect to location and content of interpretive signage and communications with the public/visitors.

In addition, Rebecca Sue Sonniksen (member of the public) recommends in comments on the draft EIS that FFP consult with the Tribes on the content of its proposed interpretive facility to ensure it communicates the “cultural heritage and significance of the area.”

Our analysis in section 3.3.6.2 concludes that coordinating construction schedules and any associated road closures with the Corps, BIA, and Tribal governments (e.g., through the Columbia River Inter Tribal Fish Commission), in addition to Klickitat County and Washington DOT, would alert tribal members and Corp personnel at the John Day Dam to potential delays and closures, and minimize disruptions to treaty fishing rights and the Corps operations. Including details on the design, location, and content of FFP’s proposed interpretive facility as part of the visual and recreational resources management plan and consulting Washington DFW, the Corps, Bureau of Land Management, Washington DOE, the National Park Service, and the Tribes to develop the plan would allow agencies and Tribes to share their expertise and ensure that the interpretative display is built to appropriate standards and that effects on the Lewis and Clark National Historic Trail and “Auto-Tour Route” are minimized. Coordinating with these additional entities would not increase the cost of developing FFP’s proposed recreation and visual resources management plan.

Historic Properties Management Plan

Project construction would directly and indirectly adversely affect the five individual archaeological resources, the larger Columbia Hills Archaeological District, and the three TCPs (*Pushpum*, *Nch’ima*, and *T’at’aliyapa*). Direct effects include the destruction and removal of five archaeological sites. These sites, consisting of lithic scatters and rock features, are eligible for listing on the National Register. They also represent a significant part of the Yakama Nation and other Tribal traditions and are contributing elements to the Columbia Hills Archaeological District and the TCPs. Indirect effects include additional permanent alterations to the viewshed (e.g., numerous wind turbines, John Day Dam, Columbia Gorge Aluminum smelter, transmission lines) that changes the setting and feeling of the TCPs and could alter the Yakama Nation’s and other Tribes’ spiritual and cultural practices.

To mitigate these effects, FFP proposes to more fully develop an HPMP in consultation with the Washington SHPO and the affected Tribes. On January 25, 2022, FFP filed a draft HPMP. The draft HPMP 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 Area of Potential

Effect (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.

The Yakama Nation, Umatilla Tribe, and Warm Springs Tribes have state that no form of mitigation is acceptable because the archaeological sites and adverse effects to the TCPs are irreplaceable. The Conservation Groups recommend that FFP develop a cultural resources management plan in consultation with and with the approval of all affected Tribes that includes all Tribal recommendations and ensures Tribal member access to the area for gathering purposes is not hindered, encumbered, or otherwise interfered with.

The draft HPMP does not identify the specific measures that would be implemented to mitigate the significant adverse effects to cultural resources that are valued by the Yakama Nation, Umatilla Tribes, Warm Springs Tribes, and Nez Perce Tribe. 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 archaeological sites, data recovery and curation would be the only option available to mitigate their loss. Project construction could also uncover previously unknown historic properties within the construction footprint, including burial sites. Using dogs trained in searching for human remains is a non-invasive means of searching for burial sites and has been successively used in several situations. Searching the archaeological sites using trained dogs and handlers as recommended by the Umatilla Tribes would help minimize the potential for inadvertently disturbing or destroying burial sites during project construction and is relatively inexpensive (estimated \$25,000 for conducting the survey).

Therefore, staff recommends that FFP revise the HPMP to include specific treatment measures for all affected archaeological sites and TCPs. The treatment plans should include research design and site-specific data recovery or other agreed-upon treatment plans, including analysis, recordation, and curation, and specific plans for construction site monitoring. Construction site monitoring should include (1) identifying the specific areas that will be monitored during construction; (2) identifying the location of the National Register-eligible cultural sites to be avoided and how they will be marked and avoided where possible; (3) surveying the archaeological sites using specially trained canines for historic and prehistoric human remains detection to minimize the potential for disturbing any undetected burial sites; and (4) 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.

Staff further recommends that the revised HPMP be implemented prior to any ground-disturbing actions that would destroy the sites. Revising the HPMP as staff recommends would entail further data recovery and recordation than that proposed by the applicant. We estimate

that the recommended additional field testing and curation and construction monitoring recommended by staff would have a levelized annual cost of \$53,060 and find that these efforts would be needed to mitigate for adverse effects to the archaeological sites eligible for the National Register.

Staff also recommend that the HPMP be developed in consultation with the Washington SHPO, Advisory Council on Historic Preservation, the Corps, and affected Tribes. While FFP might develop additional measures to address adverse effects on the TCPs, there is insufficient information to determine what those measures might be or if any would be acceptable to the Tribes. Therefore, we cannot evaluate their benefit or costs. Consequently, we do not recommend that the plan include all the measures recommended by the affected Tribes as suggested by the Conservation Groups.

Measures Not Recommended by Staff

Some of the measures recommended by Interior, NMFS, Washington DFW, TID, Yakama Nation, and the Environmental Groups would not contribute to the best comprehensive use of the Columbia River water resources, do not exhibit sufficient nexus to project environmental effects, or would not result in benefits to non-power resources that would be worth their cost. The following discusses the basis for staff's conclusion not to recommend the measures.

Post-licensing Adaptive Management Plan

The Environmental Groups recommend that FFP develop an adaptive management plan that coordinates post-licensing monitoring and adaptive management measures as necessary to ensure license conditions are meeting previously established measurable objectives and otherwise performing as forecasted over the term of the new license. Such a plan must include specific provisions for reopening the license in the event the project is not meeting measurable objectives as intended.

The Environmental Groups recommendation is vague. FFP's proposed plans already include monitoring efforts that provide a mechanism to review the results and implement additional measures if warranted. Where they are not all specific, we recommend including in the monitoring plans specific metrics to evaluate the effectiveness of the protection measures.

Moreover, should the resource agencies become aware of an unforeseen circumstance regarding project effects on fishery or wildlife resources during the term of any license issued for the project, Commission licenses include a standard license article that provides the agencies the opportunity to petition the Commission to reopen the license to consider additional mitigation measures, after notice and opportunity for hearing. For these reasons, we have no basis for recommending a post-license monitoring and adaptive management plan.

Effluent Discharges

To control erosion and sedimentation, manage stormwater and hazardous materials during construction, and manage non-stormwater discharges (i.e., dewatering activities and groundwater) during construction, FFP proposes to develop a soil erosion and sediment control

plan and implement its draft Spill Prevention Plan, draft Stormwater Management Plan, and draft Dewatering Plan. The plans would contain specific measures and protocols to prevent discharges to the Columbia River and other surface waters during construction. Further, FFP would monitor and report water quality conditions in project reservoirs to determine the need for additional measures to protect water quality during operation as part of its proposed draft Reservoir Water Quality Monitoring Plan.

NMFS recommends pursuant to section 10(a) that the license prohibit FFP from releasing any effluent discharge into the Columbia River at any point during project construction or operation and, if discharges are necessary, that NMFS be consulted. FFP states that it does not anticipate the need to release effluent discharge into the Columbia River, as the project has been designed to avoid the need for these types of discharges.

FFP does not intend to discharge effluents into the Columbia River during project construction. Standard BMPs that would be implemented under FFP's plans are routinely implemented at projects requiring new construction and would be adequate at preventing unintended discharges to the Columbia River during construction to the extent practicable. 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. Therefore, it is not necessary to include a license condition expressly prohibiting effluent discharges.

Culvert Screening, Anadromous Fish Survey, and Water Flow and Smolt Monitoring Plan

The project would use water purchased from Klickitat PUD's water supply system to fill and refill the reservoirs. That water would be pumped to the project from an "intake pool," a backwater slough separated from the Columbia River by a railroad embankment berm. Water is drawn into the "intake pool" from the Columbia River via seepage through the rock- and gravel-filled railroad embankment owned and controlled by the BNSF railroad company. There is at least one unscreened 120-foot-long, 42-inch-diameter culvert, possibly two, running through the railroad embankment that is hydrologically connected to the Columbia River and may provide periodic fish passage into the intake pool from the Columbia River. The culvert opening on the intake pool side is believed to be at 265 mean sea level (MSL). Because John Day Dam operates to maintain the forebay on the river side of the berm between 260 and 265 feet MSL from November to June and between 265 and 268 feet MSL from July to October, fluctuating water levels in the intake pool may cause the culvert opening on the intake pool side to become dewatered, trapping any fish that passed through the culvert. This scenario is more likely to occur during the months of November through June when John Day forebay water levels typically fluctuate between 260 to 265 feet.

In its revised 10(j) recommendations, NMFS and Interior recommend that FFP and/or Klickitat PUD file a written commitment to screen the known culvert in a manner consistent with NMFS' fish screening criteria prior to filling the reservoirs. NMFS states that while it has no evidence that ESA-listed salmon are regularly entering the intake pool from the Columbia River, the known culvert is likely submerged during the juvenile salmon smolt migration window and thus may provide passage for some ESA-listed fish to enter and subsequently become entrained within the intake pool. NMFS states that because the intake pool is known to support

piscivorous fish species, any juvenile salmon entering the pool would be lost to predation. If a written agreement to screen the culvert cannot be filed, NMFS and Interior recommend FFP conduct an anadromous fish survey in the intake pool to determine whether salmon smolts are using the intake pool and to inform the need for further screening. Interior also recommends that if FFP is permitted to withdraw water to refill the reservoirs during the April 1 through August 31 smolt migration period, that FFP develop and file a water flow and smolt monitoring plan that contains methods for monitoring flow rate through the railroad culverts prior to and during the refill period, a provision to document any smolts observed on each end of the culvert(s), and a provision to report results to the resource agencies. Interior states the need for the plan and subsequent monitoring would be contingent on: (1) whether any refill withdrawals are planned to occur within the April 1 through August 31 salmon migration window; (2) the railroad culverts that connects the intake pool to the Columbia River are not already screened in a manner consistent with NMFS' fish screening criteria; and (3) no fry or juvenile salmonid surveys have been conducted in the intake pool. In comments on the draft EIS, American Rivers and the Yakama Nation support the need for a fry and juvenile entrainment survey within the intake pool.

In comments submitted on the draft EIS, Klickitat PUD expressed a willingness to voluntarily work with BNSF to screen the culvert to prevent fish entrainment into the intake pool.

As discussed in section 3.3.3.2, we do not know what the infiltration rate into the pool is through the railway berm or how Klickitat PUD's withdrawal of up to 35 cfs to fill the project reservoirs might affect pool levels. However, given the John Day reservoir operation levels, it is reasonable to conclude that any salmonid smolts that enter the culvert could become trapped in the intake pool and likely lost to predation.

Installing screens on the culvert that meet agency criteria would minimize or prevent ESA-listed smolts from entering the intake pool throughout the year. We do not have sufficient information to estimate the cost of screening the culvert. However, as discussed previously, restricting the fill and refill timing to avoid the peak smolt migration months of April through August would reduce the likelihood of outmigrating salmonids from becoming entrained within the intake pool due to project-related water withdrawals regardless of whether the culvert is screened. Because implementing the restrictions of filling and refilling the reservoirs would be sufficient to prevent project-related withdrawals from entraining ESA-listed salmon smolts, we do not recommend requiring FFP to screen the culvert, conduct a survey of the intake pool at an annualized cost of \$4,078, or develop a water flow and smolt monitoring plan to inform the need for further screening at an annualized cost of \$1,359.

Intake Fish Screen

Klickitat PUD's pump station and infiltration gallery is located on the northwest corner of the intake pool (approximately 400 feet from the railway embankment berm). Water flows about 30 feet through the infiltration gallery containing 2,400 cubic yards of clean gravel to six vertical pumps installed 20 to 30 feet deep and in 48-inch diameter perforated casings. Water infiltrating the gravel is pumped up and enters Klickitat PUD's water conveyance pipes that currently service the former smelter cleanup site. When filling the reservoir, FFP would

purchase water from Klickitat PUD who in turn would utilize its existing facilities to convey water from the infiltration gallery to a water supply vault approximately 2 miles north and west of the intake infiltration gallery where it would be conveyed to the project's lower reservoir via a new reservoir fill line.

The Environmental Groups recommend installing fish screens on Klickitat PUD's intake that meet or exceed NMFS and Washington DFW screening requirements. In its revised 10(j) recommendations, Interior as well as Washington DFW recommend that if Klickitat PUD's infiltration gallery fails or needs repair, FFP should consult with the resource agencies and make the infiltration gallery conform to NMFS's and Washington DFW fish screen criteria. Additionally, Interior recommends in comments on the draft EIS that FFP develop a plan to monitor the effectiveness of the existing infiltration gallery and any screens installed on the culverts within the railroad berm and that the plan include corrective actions in the event these structures fail.

Both FFP and Klickitat PUD state that the infiltration gallery prevents fish entrainment from the intake pool into the pump station; thus, additional pump intake screening is not warranted.

If the Commission issues a license and determines that the infiltration gallery, pumping station, and culvert should be included as licensed project facilities, then FFP could be required to ensure that they are maintained. However, there is no information in the record that suggests that Klickitat PUD's infiltration gallery is not operating as intended or would require repairs or modifications in the future. Regardless, our analysis shows that fry and juvenile anadromous fish that enter the intake pool are unlikely to 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 which should be impenetrable to fry. In addition, we note that Interior states in its June 6, 2023, letter commenting on the draft EIS that "while [an] infiltration gallery is not the preferred method of fish screening, the FWS acknowledges that it has been reviewed by engineers and deemed sufficient to mitigate entrainment concerns, in this case." There is not enough design information on the Klickitat PUD's existing pumping station to estimate how much it would cost to add fish screens to the existing infiltration gallery to further minimize the possibility of entrainment. Nevertheless, for the reasons explained above, we do not have a sufficient reason to recommend screening these structures or to recommend modifying Klickitat PUD's existing pump station to meet agency screening criteria.

Wind Study

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.

FFP states that its wind analysis study reasonably demonstrates that project operation would not substantially alter wind patterns and opposes conducting further studies.

FFP contracted ERM (2021b) to evaluate the changes in wind speed, 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). The model shows some increases and decreases in wind and turbulent kinetic energy (TKE), but the average change would be near zero. Wind speed and direction changes, on average, are also close to zero at the locations of all turbines (ERM, 2021b). 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.

For these reasons, we believe that construction and operation of the pumped storage project would have a negligible effect on the adjoining wind farm's operation and do not recommend further studies at an annualized cost of \$63,806.

**APPENDIX H – FISH AND WILDLIFE AGENCY SECTION 10(J)
RECOMMENDATIONS**

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As discussed in Section 5.3, *Fish and Wildlife Agency Recommendations*, the following section addresses the revised recommendations filed pursuant to section 10(j), summarizes the outcomes of the 10(j) meeting held between Commission staff and the National Marine Fisheries Service (NMFS) on May 3, 2023, indicates whether the recommendations are included in the staff alternative, and includes the specifics of any inconsistencies that remain and our determinations. Recommendations that we consider outside the scope of section 10(j) have been considered under section 10(a) of the Federal Power Act (FPA) and are addressed in the specific resource sections of Section 3.0, *Environmental Analysis*, in Section 5.1, *Comprehensive Development and Recommended Alternative* and in Appendix G.

Maintain the Existing Infiltration Gallery within the Intake Pool to Prevent Fish Entrainment

In the draft environmental impact statement (EIS), staff did not adopt the U.S. Department of the Interior's (Interior) 10(j) recommendation that FFP Project 101, LLC (FFP) install and maintain new fish screens on Klickitat Public Utility District's (Klickitat PUD) intake or Washington Department of Fish and Wildlife's (Washington DFW) 10(j) recommendation that FFP maintain the infiltration gallery and modify the structure to make it conform to NMFS and Washington DFW fish screen criteria if the infiltration gallery fails. Staff reasoned that the 30 feet of gravel in front of the existing infiltration gallery would be nearly impenetrable to fry and juvenile fish and thus staff did not have a sufficient reason to recommend that FFP add fish screens or modify Klickitat PUD's existing pump station to meet agency screening criteria.

In its June 6 and August 4, 2023 comment letters, Interior states that it now considers the existing infiltration gallery sufficient at preventing fish entrainment within Klickitat PUD's water delivery system and thus Interior no longer recommends adding new screens on Klickitat PUD's intake facilities at this time. Therefore, the inconsistency is resolved.

On a related matter, when Interior withdrew its prior fish screen recommendation, it submitted a new recommendation that FFP ensure that Klickitat PUD's infiltration gallery be properly maintained. As discussed in in Section 5.1, *Comprehensive Development and Recommended Alternative* and Appendix G, if the Commission decides that Klickitat PUD's infiltration gallery should be a licensed project facility, then FFP could be required to properly maintain the infiltration gallery.

Timing of Water Withdrawals to Minimize Impacts to Salmonid Smolt Migration

In the draft EIS, staff did not adopt NMFS's 10(j) recommendation that FFP not use water withdrawn from the Columbia River for the initial fill any time from March 15 through October 15 and not refill the reservoirs any time from March 1 through November 1 to ensure sufficient flows for outmigrating juvenile salmonids. In the draft EIS, staff found that the proposed withdrawals during the fish passage season would be minor relative to Columbia River flows passing near the project and that NMFS' recommended timing restriction would likely delay filling the reservoirs and commencing commercial operation of the project by approximately 11 months, resulting in a levelized cost of \$32,248,410. Staff concluded in the draft EIS that avoiding any project-related withdrawal by Klickitat PUD during the fish passage season would not be worth the costs.

At the 10(j) meeting, NMFS stated that additional consumptive uses of Columbia River water, however small, would contribute to a cumulative impact on the timing and success of salmon migrations in the Columbia River, particularly given the multiple other withdrawals already occurring in the basin. NMFS also argued that the timing restriction would not delay the initial fill of the project reservoirs because the initial fill would need to occur over two calendar years given the constraints of Klickitat PUD's water right that FFP would be operating under. FFP concurred and clarified that filling would begin in the fall and carry over into the following year, which would not lead to an extended delay in completing the fill. Following the meeting, both NMFS and Interior revised their 10(j) recommendation to recommend that FFP not conduct the initial fill or annual refill between April 1 and August 31. The agencies believe this updated measure would reduce the potential effect of project-related consumptive withdrawals on ESA-listed salmon and steelhead migration and should not result in delays for FFP in filling the reservoir and commencing operation.

In its June 6, 2023 filing, FFP agreed not to withdraw water for initial fill any time from April 1 to August 31 consistent with NMFS's and Interior's revised recommendations; however, FFP continues to oppose any seasonal restriction on utilizing Klickitat PUD water for refilling the reservoir each year after the initial fill is completed.

In its application, FFP states that it has some flexibility in the timing of annual refills, indicating that refills could occur once per year, or over multiple, shorter withdrawals per year, depending on site conditions. We estimate that it would take about 8.6 days to refill the reservoir with 360 acre-feet at 21 cfs (projected average annual refill rate). Given FFP's stated flexibility in refilling the reservoirs and the short time that would be needed to complete the refill, avoiding refilling the reservoirs during the peak smolt migration period should not pose a significant problem to project operation and would prevent project-related reductions in Columbia River flows during the peak smolt migration period. For these reasons, staff now recommend FFP limit filling and refilling the project reservoirs between September 1 and March. Therefore, the inconsistency is resolved.

Water Flow and Smolt Monitoring Plan

In its revised 10(j) recommendations filed on August 4, 2023, Interior acknowledges that FFP has not proposed a timing restriction for conducting annual refill like it does for the initial fill. As a result, Interior recommends that prior to FFP withdrawing water during the April 1 through August 31 period, that FFP first develop and file a water flow and smolt monitoring plan that contains methods for monitoring flow rate through the railroad culverts prior to and during the refill period, a provision to document any smolts observed on each end of the culvert(s), and a provision to report results to the resource agencies. Interior states the need for the plan and subsequent monitoring would be contingent on: (1) whether any refill withdrawals are planned to occur within that April 1 through August 31 salmon migration window; (2) whether the railroad culverts that connect the intake pool to the Columbia River not being already screened in a manner consistent with NMFS' fish screening criteria; and (3) if no fry or juvenile salmonid surveys have been conducted in the intake pool.

As discussed previously, staff now recommend that FFP not conduct the initial fill *or* annual refill between April 1 and August 31 to avoid any project-related withdrawals from

contributing to further reductions in the Columbia River flow that could affect migrating listed salmon. Because Interior states that the need for the plan and further monitoring would be contingent on whether any annual withdrawals occur during this migration window, staff now consider the issue to be moot and there is no inconsistency that needs further resolution.

Restrictions on In-channel Project Construction in the Columbia River

In the draft EIS, staff did not adopt NMFS's 10(j) recommendations that FFP not place permanent structures or impoundments in the Columbia River or pile drive in the Columbia River anytime between 1 March and 1 November. NMFS recommended these measures to protect juvenile and adult salmonids from high intensity sounds and predation from new structures that would afford fish predators additional vantage points that would not be there otherwise. At the 10(j) meeting held on May 3, 2023, staff reiterated its findings in the draft EIS that no in-water work or new structures in the Columbia River are being proposed by FFP and thus staff have no basis for recommending a license requirement that restricts placing permanent structures or impoundments in the Columbia River or restricts pile driving. Staff also noted that if any in-water work were to be proposed in the future, FFP would need to file a license amendment application and the issue could be revisited at that time.

In its June 6, 2023 letter, NMFS stated that based on the discussions at the 10(j) meeting, it no longer recommends conditions pertaining to in-water structures or pile driving. Thus, the inconsistency is resolved.

Table H-1. Fish and wildlife agency recommendations for the Goldendale Project (Source: staff).

Recommendation	Agency	Within the Scope of Section 10(j)	Levelized Annual Cost	Adopted?
Include the intake pool and Klickitat PUD’s water pump station and water conveyance system within the project boundary and file revised project boundary exhibits.	Washington DFW; Interior	No. Filing project boundary exhibits are an administrative matter, not a specific fish and wildlife measure.	\$0	No. A project boundary determination will be made in the license order if a license is issued.
Ensure the existing infiltration gallery is properly maintained and operated for project water withdrawals and if it fails and needs repair, then FFP should consult with the resource agencies and make the infiltration gallery conform to NMFS and Washington DFW fish screen criteria.	Washington DFW; Interior	Yes to maintaining the infiltration gallery. However, future modifications to project structures would be a license amendment action and thus would not be within the scope of the licensing action.	Unknown. Costs would depend on engineering details that are not available	Yes, to maintain the gallery, if the gallery is determined by the Commission to be a project facility. No to the recommended future conditional modification, because a decision on the matter is premature.
File a written commitment in coordination with Klickitat PUD to screen any railroad berm culverts that conform to NMFS’ fish screening criteria prior to filling the reservoirs. If a written commitment cannot be filed, conduct a fry and juvenile entrainment survey in the intake pool within 12 months of license issuance	NMFS; Interior	No; filing a written commitment is an administrative matter, and the recommended survey is a conditional, future measure	Costs to potentially screen the railway berm culvert(s) consistent with agency criteria would depend on engineering details that are not available. Costs for conducting a fry and juvenile and entrainment survey are estimated to be \$4,078	No. ^a

Recommendation	Agency	Within the Scope of Section 10(j)	Levelized Annual Cost	Adopted?
Avoid receiving water from Klickitat PUD for initial fill and annual refill any time between April 1 and August 31 to ensure sufficient flows in the Columbia River for outmigrating juvenile salmonids	NMFS; Interior	Yes.	\$0	Yes.
If refill is scheduled between April 1 and August 31 and the railroad culverts are not screened and no juvenile salmonid survey has been conducted, develop a water flow and smolt monitoring plan prior to withdrawing water that contains methods for (1) monitoring flow rate of water into the culvert prior to and during withdrawals; (2) documenting smolts observed in and around the culvert; and (3) reporting results to the resource agencies.	Interior	Yes.	\$1,359	No. ^a

Recommendation	Agency	Within the Scope of Section 10(j)	Levelized Annual Cost	Adopted?
<p>Develop within 1 year of license issuance a bird and bat reservoir deterrent management plan that includes measures such as using shade balls to deter birds from using reservoirs, using acoustic bat deterrents to deter bats from using reservoirs, conducting acoustic monitoring of bats and point count surveys to monitor bird use in reservoirs year-round, and provide an annual report to Washington DFW, FWS, Yakama Nation, and the Commission.</p>	<p>Washington DFW</p>	<p>Yes.</p>	<p>\$3,590^e</p>	<p>Yes.</p>
<p>Develop within 1 year of license issuance a management plan for the conservation of the golden eagle lands that includes the following measures: ensure mitigation lands are located in an area of known golden eagle and prairie falcon nesting habitat and provide forage species that benefit these birds; control noxious weeds; manage public access to avoid disturbing raptors; wildlife mitigation measure such as replanting or burned areas with native species; fencing to protect and improve the habitat; and development of a wildlife water</p>	<p>Washington DFW</p>	<p>Yes.</p>	<p>\$7,441</p>	<p>Yes.</p>

Recommendation	Agency	Within the Scope of Section 10(j)	Levelized Annual Cost	Adopted?
guzzler if there is an identified need for a water source. Update the plan every 5 years				
<p>Develop and file within 1 year of license issuance and prior to onset of ground-disturbing activities an avian protection plan that includes the following: conducting pre-construction surveys for birds, nests or roosts; establishing buffers for construction activities; constructing transmission structures according to bird protection standards and guidelines; adjusting lighting systems to minimize disruption of nighttime foraging; marking fencing around the reservoirs to prevent avian collisions; ensure adequate insulation and other necessary measures to protect raptors from electrocution hazards; retrofit or rebuild power poles involved in a bird fatality in accordance with the most recent guidelines for avian protection (i.e., APLIC standards) to increase safety for large perching birds; and a provision to install bird flight diverters on any new transmission lines; update the plan as needed through adaptive management in consultation with the agencies.</p>	Interior	Yes.	\$2,544	Yes.

Recommendation	Agency	Within the Scope of Section 10(j)	Levelized Annual Cost	Adopted?
<p>Modify the proposed Vegetation Management and Monitoring Plan to include the following additional measure: perform two pre-construction surveys (once in the early spring and once in the mid-summer including within upland shrub-steppe and riparian areas) to identify and document any state or federally listed threatened, endangered, or sensitive plants within areas to be disturbed; invite Washington DFW, Oregon DFW, Washington National Heritage Program, and FWS to participate in the pre-construction surveys to assist in identifying botanical resources and plan avoidance measures; revegetate disturbed areas with native seed mix using locally adapted genetic materials and consult with the resource agencies prior to replanting including conducting supplemental plantings in applicable seasons if plants of cultural or spiritual importance are found; monitor all revegetated areas annually for five years and re-treat and re-monitor areas as needed; control Class A noxious weeds using appropriate</p>	<p>Interior</p>	<p>Yes.</p>	<p>\$1,087</p>	<p>Yes.</p>

Recommendation	Agency	Within the Scope of Section 10(j)	Levelized Annual Cost	Adopted?
mechanical, biological, and chemical treatments; and implement fire suppression measures during construction and operation to minimize potential damage to wildlife habitat.				
Include western monarch butterfly and milkweed in pre-construction surveys and if the species or its habitat occurs in the area to be disturbed, then develop a monarch butterfly management plan that includes measures to protect the butterfly’s milkweed habitat.	Interior	Yes.	\$544 ^d	Yes.

- ^a Preliminary finding that recommendations found to be within the scope of section 10(j) are inconsistent with the comprehensive planning standard of section 10(a) of the FPA, including the equal consideration provision of section 4(e) of the FPA are based on our determination that the costs of the measures outweigh the expected benefits.
- ^b Preliminary finding that recommendations found to be within the scope of section 10(j) are inconsistent with the substantial evidence standard of section 313(b) of the FPA.
- ^c Additional levelized cost for conducting bird and bat surveys. Remaining measures are proposed by FFP and included in its costs for implementing the Wildlife Management Plan (\$965,846 levelized cost).
- ^d Additional levelized cost for developing a monarch butterfly management plan. Remaining measures are proposed by FFP and included in its costs for implementing the Wildlife Management Plan (\$965,846 levelized cost) and Vegetation Management Plan (\$30,068 levelized cost).

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APPENDIX I – LIST OF COMPREHENSIVE PLANS

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Section 10(a)(2)(A) of the Federal Power Act, 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. We reviewed 71 comprehensive plans for the states of Washington and Oregon that are applicable to the Goldendale Project. No inconsistencies were found. The following plans were reviewed:

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APPENDIX K – LIST OF PREPARERS

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Federal Energy Regulatory Commission

Michael Tust—Project Coordinator (Interagency Hydropower Coordinator; M.A. Marine Affairs and Policy; B.A. Marine Science Affairs)

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WSP (Direct Contractor)

Alynda Foreman—Project Manager (Ecologist; M.S., Environmental Research and Education, Multidisciplinary Studies; B.A., Biological Science)

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Steve Byrne—Aquatic Resources (Fisheries Biologist; M.S., Marine and Environmental Biology; B.S., Biology)

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Kenneth Hodge—Engineering, Need for Power, Project Description and Operation, Geology and Soils, and Developmental Analysis (Lead Engineer; B.S., Civil Engineering)

Robert Klosowski—Engineering and Developmental Analysis (Senior Consultant; M.S., Resource Economics; B.S., Electrical Engineering)

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Brandon Yeh—Socioeconomics (Senior Consultant, Alternative Delivery; MA, International Relations and Economics; BA, Political Science and China Studies)

**APPENDIX L – COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT
STATEMENT**

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Commission staff issued the draft environmental impact statement (EIS) for the proposed Goldendale Energy Storage Project (No. 14861-002) on March 31, 2023. Comments on the draft EIS were due by June 6, 2023. In addition, Commission staff conducted two public meetings in Goldendale, Washington, on May 3, 2023. Statements made at the meetings were recorded by a court reporter and incorporated into the Commission's public record for the proceeding.¹⁹ The following entities filed comments on the draft EIS:

Commenting Entity	Date Filed
Bryce Campbell	April 24, 2023
Julie (no surname included)	May 2, 2023
Cameron Wilkinson	May 4, 2023
Jessica Metta	May 4, 2023
M.S. Jones	May 4, 2023
Jim Batterberry	May 10, 2023
Leslie Hiebert	May 10, 2023
Dana Peck	May 17, 2023
Seth Worley	May 22, 2023
Kim Clarkin	May 23, 2023
Lach Litwer	May 23, 2023
Mike Bridges	May 23, 2023
Mark Riker	May 24, 2023
Diana Winther	May 26, 2023
Diana Gordon	May 30, 2023
Joe Dabulskis	May 30, 2023
Jonathan Lewis	May 30, 2023
Dave McClure, Klickitat County Natural Resources and Economic Development Department	June 1, 2023
John D. Loranger	June 1, 2023
Matthew Hepner	June 1, 2023
Rebecca Sue Sonniksen	June 4, 2023
American Rivers	June 5, 2023
National Marine Fisheries Service (NMFS)	June 5, 2023; June 6, 2023
Oregon Department of Fish and Wildlife (Oregon DFW)	June 5, 2023
Columbia Riverkeeper, Washington Conservation Action, Sierra Club, and Friends of the White Salmon River (collectively, Environmental Groups)	June 6, 2023
Columbia Riverkeeper	June 6, 2023
Bob Carroll	June 6, 2023
Brent Stephens	June 6, 2023
Mayor Mike Canon, City of Goldendale	June 6, 2023

¹⁹ See transcripts of the May 3, 2023 draft EIS public meetings issued on June 1, 2023.

Commenting Entity	Date Filed
Cynthia M. George	June 6, 2023
David A. Myers	June 6, 2023
U.S. Department of the Interior (Interior)	June 6, 2023; August 4, 2023
U.S. Environmental Protection Agency (EPA)	June 6, 2023
Garth Bachman	June 6, 2023
James Oliver	June 6, 2023
Joseph Clare	June 6, 2023
Joseph Bond	June 6, 2023
Klickitat County Public Works Department	June 6, 2023
Marshall Wilson McGrady	June 6, 2023
Matthew Nosack	June 6, 2023
Michelle Murphy	June 6, 2023
Nate Stokes	June 6, 2023
Rye Development (on behalf of FFP Project 101, LLC)	June 6, 2023; August 11, 2023
Steve Hussey	June 6, 2023
Travis Swayze	June 6, 2023
Turlock Irrigation District (TID)	June 6, 2023
Uriah J. Chipman	June 6, 2023
Wayne Tanner	June 6, 2023
Washington Department of Fish and Wildlife (Washington DFW)	June 6, 2023
William Hodges	June 6, 2023
Public Utility District No. 1 of Klickitat County (Klickitat PUD)	June 7, 2023
Larry O. Moser	June 7, 2023
Les Perkins	June 7, 2023
Marcy Grail	June 7, 2023
Matt Smyth	June 7, 2023
Mike McArthur	June 7, 2023
Peter Ullrey	June 7, 2023
Rylan M. Grimes	June 7, 2023
Theone Wheeler	June 7, 2023
Confederated Tribes and Bands of the Yakama Nation (Yakama Nation)	June 7, 2023
Confederated Tribes of the Umatilla Indian Reservation (Umatilla Tribes)	June 16, 2023; January 23, 2024

Comments supporting (81 submittals) and opposing (41 submittals) the project were filed or made at the draft EIS public meetings. We do not address general comments supporting or objecting to the project, minor editorial changes, requests for a legal determination (e.g., recommendations for facilities to be considered licensed project works and enclosed within the project boundary, etc.), or reiterate a stakeholder's position or recommendation that has been previously provided. Rather, we

summarize the comments received on the draft EIS that pertain to the analyses; provide responses to those comments; and indicate, where appropriate, how we modified the final EIS. Below, we group the comment summaries and responses by topic for convenience.

GENERAL COMMENTS

Comment: The Environmental Groups state that the Commission should apply the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations that were in effect prior to the CEQ's July 16, 2020 final rule to revise the EIS.

Response: We prepared this EIS in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA),²⁰ the Council on Environmental Quality (CEQ) regulations for implementing NEPA,²¹ and the Commission's implementing regulations.²²

Comment: Jessica Metta, on behalf of the Mid-Columbia Economic Development District, states that the draft EIS should "consider the positive environmental impacts of cleaning up a very contaminated industrial site and utilizing it in a way that will help the region meet its clean energy goals over the next century."

Response: No modification to the EIS is required because the EIS already addresses these potential benefits.

Comment: EPA recommends the final EIS summarize and incorporate the section 401 Water Quality Certification conditions and commit to the conditions.

Response: The final EIS incorporates the Water Quality Certification (WQC) conditions. As a general matter, although the conditions of a valid Water Quality Certification are mandatory, we must still weigh the benefits and costs of these conditions as required by sections 4(e) and 10(a)(1) of the Federal Power Act (FPA). As we discuss in section 5.1, *Comprehensive Development and Recommended Alternative*, and in Appendix G, the recommended Staff Alternative includes all of the Water Quality Certification conditions.

Comment: EPA suggests that the EIS summarize the status of all permits or approvals needed by the project to help the public and responsible agencies understand the scope of work and assist with construction planning and scheduling, as well as measures to reduce risks to environmental resources.

Response: Appendix C of the final EIS describes the status of those statutory and federal regulatory requirements needed for the Commission to issue a licensing decision (e.g., FPA, Clean Water Act, Endangered Species Act (ESA), National Historic Preservation Act (NHPA),

²⁰ National Environmental Policy Act of 1969 amended (Pub. L. 91-190, 42 U.S.C. §§ 4321–4347, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, Pub. L. 97-258, §4(b), September 13, 1982, Pub. L. 118-5, June 3, 2023).

²¹ 40 CFR Parts 1500-1508

²² 18 CFR Part 380.

etc.). Any other regulatory requirements that do not relate to the Commission's licensing jurisdiction are beyond the scope of this EIS.

Comment: TID states that the Commission should hold the EIS process in abeyance until FFP demonstrates that it has: (1) secured the requisite property rights to construct the upper reservoir on property currently leased by Tuolumne Wind Project Authority (TWPA), which would include FFP obtaining TWPA's written consent to the construction of the project, as the proposed location for the project could change without such consent; (2) mitigated the adverse impacts on TWPA's wind farm caused by the project and TWPA has approved the mitigation measures; and (3) entered into an agreement with TWPA to compensate TWPA and other stakeholders for any adverse impacts that the project causes to the wind farm that are not mitigated, so that TID's ratepayers are not stuck paying the costs of such adverse impacts.

Response: Securing all the property rights needed to develop a project is not a prerequisite to receive a license. However, if a license is issued for the project, Standard License Article 5 requires that the licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project.

Regarding property damage mitigation, the Commission does not have authority to adjudicate claims for, or to require payment of damages for the project-induced adverse effects to property of others.²³ Should the project be licensed and constructed and TID believes that adverse project-related effects are occurring to its wind farms, they can seek redress with FFP in state court.²⁴

Regarding the potential for the proposed project to adversely affect operation of the wind farm, the EIS analyzes the compatibility of the proposed project with existing land uses (i.e., existing wind farms located adjacent to and near the project). The analysis in section 3.3.6.2, *Recreation and Land Use, Environmental Effects*, concludes that construction and operation of the project should not be incompatible with the adjoining wind farm's operation.

Comment: Columbia Riverkeeper requests that the response to comments section of the final EIS include a chart summarizing "each alternative and the impacts to endangered species, cultural resources, wetlands, air quality, water quality, drinking water, environmental justice, and wild and scenic rivers."

Response: The effects of constructing the project on environmental resources is discussed in section 5.1, *Comprehensive Development and Recommended Alternative*, and in Appendix G. Therefore, a summary table is not needed or required.

²³ See, e.g., *Ohio Power Co.*, 71 FERC ¶ 61,092, at 61,312 (1995) (citing *S.C. Pub. Serv. Auth. v. FERC*, 850 F.2d 788, 795 (D.C. Cir. 1988)).

²⁴ See *PacifiCorp*, 133 FERC ¶ 61,232, at P 163 (2010), *order on reh'g*, 135 FERC ¶ 61,064 (2011); *Portland Gen. Elec. Co.*, 107 FERC ¶ 61,158, at PP 27-33 (2004); *FPL Energy Maine Hydro, LLC*, 106 FERC ¶ 61,038, at PP 53-55 (2004).

PROJECT FACILITIES

Comment: Interior states that the Commission should determine and state in the EIS whether the intake pool and Klickitat PUD's existing pump station and two-mile-long water conveyance line should be project facilities and included in the project boundary because "delaying the definition of the project boundary affects the FWS's ability to adequately analyze the project impacts and provide meaningful protection, mitigation, and enhancement measures associated with the facilities' use and maintenance during the duration of the license." Interior states that FFP has not proposed any other alternative source of supply of water to fill and maintain the reservoirs; therefore, Klickitat PUD's facilities as well as the culvert within the railroad berm are clearly necessary for the operation and maintenance of the project. In addition, Interior and other commenters assert that the EIS must address the environmental effects of these facilities. Interior adds that the Commission has previously included within pumped storage project boundaries the lands on which water fill and conveyance systems occur, even if not owned by the applicant (citing *GB Energy Park LLC*, 157 FERC 62,196 (2016) (licensing order for the Gordon Butte Pumped Storage Project No. 13642, including within the project boundary the irrigation facilities of the private ranch used to obtain the water for the project). NMFS states that the Commission should "(1) clearly state that two iterations of the project boundary are being considered and (2) develop project alternatives that analyze both boundary iterations."

Response: As stated previously, a determination on whether certain facilities are considered licensed project works and enclosed within the project boundary will be made in the license order. In the final EIS, however, we evaluate the benefits and costs of measures recommended for the facilities in question (i.e., the culvert within the railway berm, intake pool, and Klickitat PUD's municipal intake, pump station, and water conveyance line) and provide staff recommendations, with certain caveats related to a project boundary determination. For example, section 5.1, *Comprehensive Development and Recommended Alternative*, and Appendix G state that if Klickitat PUD's existing water pump station, infiltration gallery, and conveyance pipe are determined by the Commission to be licensed project works, then FFP could be required to enclose these facilities within the project boundary, file updated project boundary exhibits, and maintain these facilities for the term of any license issued.

Comment: In comments provided at the draft EIS public meetings, Klickitat PUD clarified that Klickitat PUD currently draws water from the intake pool to serve three customers (one agricultural customer and two industrial customers including FFP).

Response: We have revised the final EIS accordingly.

Comment: Klickitat PUD and Klickitat County Natural Resources and Economic Development Department state that the intake pool is not owned or controlled by Klickitat PUD; rather, the intake pool is a "backwater slough formed as a result of a railroad berm being constructed to bridge a land feature and [to] support Burlington Northern Sante Fe Railway's (BNSF) railroad." state that the railway berm containing the culvert is not owned by or under the control of Klickitat PUD but is instead owned by BNSF.

Response: We have revised the final EIS accordingly.

Comment: Interior states that the draft EIS does not appear to indicate how the water used to supply the project would be conveyed.

Response: Section 2.2.1, *Existing Facilities to be used by the Project*, states that water for the project would be pumped up from the infiltration gallery at the intake pool and conveyed via an existing 2-mile-long industrial water conveyance line to a water supply vault at the former aluminum smelter site. Section 2.2.4.1, *Initial Reservoir Fill*, explains that FFP's new water fill line would connect through a shut-off and throttling valve to a new flanged water supply service connection in Klickitat PUD's municipal water supply vault. No modification to the EIS is required.

PURPOSE OF ACTION AND NEED FOR POWER

Comment: The Environmental Groups state that the Commission has failed to properly define the project's purpose and need and suggests that the true purpose of the project is to "facilitate the transition to Washington's clean energy future." The Environmental Groups also state that the Commission must assess all reasonable alternatives that will support this goal and that "to do less would be to artificially restrict the purpose and need for this project to no other end than to prevent the consideration of reasonable alternatives." Columbia Riverkeeper added that "we do not need the Goldendale Pumped Storage Project to meet the Northwest clean energy goal. Instead, we should look to the Columbia River Intertribal Fish Commission's Energy Vision Report, which provides an in-depth look at how to meet the region's clean energy goals while accounting for the rights of tribal nations."

In contrast, the Mayor of the City of Goldendale stated that the State of Washington's Clean Energy Transformation Act requires that all the state's 19 utilities supply non-global greenhouse electricity by 2045 and that it will be necessary to build new infrastructure like the Goldendale Project to supply this green energy.

Response: Section 1.2.1, *Purpose of Action*, explains that the purpose of the proposed project is to provide a new source of hydroelectric power that would be used to meet peak energy demands and provide ancillary services to the electrical grid, such as balancing load when power from renewables is not available. Section 1.2.2, *Need for Power*, acknowledges that pumped storage would also play a role in meeting the State of Washington's goal of transitioning to 100 percent clean electricity by 2045; however, the EIS also considers the needs in the operating region in which the project would be located and finds that power from the project would help meet demand for power for the region in both the short- and long-term, regardless of the State's renewable energy goal. If the Commission denies the license, 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. No modification of the EIS is required. We address alternative technologies that might be used to meet the state's goals below under the Proposed Action and Alternatives comment section.

Comment: EPA states the agency appreciates that section 1.2.2, *Need for Power*, discusses the regional energy needs but that it "would be useful to the public for the FEIS to address the potential impacts across the full temporal scope of the proposed license term (also, please clarify whether it is 30 or 50 years) in addition to the provided 10-year analysis."

Response: The North American Electric Reliability Corporation (NERC) annually forecasts electricity supply and demand nationally and regionally for a 10-year period. Trying to estimate supply and demand beyond these 10-year projections would be speculative. Regarding the temporal scope of a potential license term, the Commission established a 40-year default license term policy for original and new licenses, effective October 26, 2017. A decision on the term of the license would be discussed in the license order, should the project be licensed.

PROPOSED ACTION AND ALTERNATIVES

Comment: Jack Compton states that it seems illogical to license a project that would use 4.3 million megawatt-hours (MWh) annually to pump water to the upper reservoir but would generate for only 8 hours per day and produce only 3.5 million MWh per year.

EPA states it would also be useful to the public for the final EIS to “explain the functionality of the proposed project with additional context describing how this project will be integrated into the regional electrical grid (i.e., the local wind and solar facilities).”

Response: As described in section 4.0, *Developmental Analysis*, pumped storage projects are generally net energy consumers because they require more energy to pump water to the upper reservoir than is produced when generating. However, pumped storage projects have other benefits that help offset the higher costs of pumping including meeting peak energy needs and providing ancillary services to the transmission grid (such as spinning reserves, grid frequency regulation, voltage support and regulation, load following capability, peak shaving, and black-start capability). Currently, the electrical grid is balanced by regulating the various sources of power to provide additional power within a few minutes such that the need for electricity is met and both voltage and frequency of the electrical grid are kept constant. With the increased percentage of wind and solar power, which are intermittent and variable sources of power, there is a greater need for balancing power. The EIS already explains that power generated from pumped storage projects help stabilize power demand and grid stability when these intermittent resources are unavailable. Therefore, no modifications to the EIS are needed.

Comment: John D. Loranger states that “storage options that are less invasive like gravity storage should be explored.” The Environmental Groups state that the applicant admits that there are “other viable, least-cost energy storage options available” in addition to its preferred pumped storage technology; therefore, the Environmental Groups believe that the Commission is obligated to identify these alternatives (such as lithium-ion (Li-ion) batteries) and explore the relative environmental impacts of implementing these technologies to meet Washington’s goal of moving to all renewable electricity generation.

Eric Strid states that pumped storage directly competes with new battery technologies that are getting cheaper. Mr. Strid states that the “total cost of this type of project is around \$200 per kilowatt hour of energy stored. While lithium-ion batteries now cost about \$130 per kilowatt hour, it will be less than \$100 per kilowatt hour by 2030, when this project might be done.”

Response: Under NEPA, a federal agency may use the proposed project purpose and need of an applicant as the basis for evaluating alternatives. However, the purpose and need may not be tailored so narrowly as to preclude the consideration of an alternative, but an agency need only

consider alternatives that will bring about the ends of the proposed action, and the evaluation is “shaped by the application at issue and by the function that agency plays in the decisional process.” *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 199 (D.C. Cir. 1991). Further, alternatives may be eliminated if they will not achieve a project’s goals or are otherwise unreasonable. 42 U.S.C. § 4332(2)(C)(iii). As the Li-ion battery storage facility and other technologies are energy alternatives outside of the Commission’s jurisdiction, analyzing such alternatives go beyond NEPA’s “rule of reason” for an agency to identify and analyze technically and economically feasible alternatives and is not necessary to analyze the present proposal. Similarly, when analyzing the proposed project, we need not develop and analyze every potential location for the proposed action as they are not proposed by the applicant.

Regardless, as discussed in section 6.0 of Exhibit D of FFP’s license application, Li-ion batteries generally have excellent energy and power densities and round-trip efficiency; however, the average duration of Li-ion batteries is 4 hours, which limits their ability to support the integration of high percentages of renewable energy. FFP also points out that the relatively short cycle life of Li-ion batteries, which can range from 500 to 10,000 cycles depending on usage and the specific Li-ion chemistry used, translates into a 3- to 15-year lifespan, making Li-ion batteries an expensive choice for long-term grid applications. Whereas a pumped storage project can have a life of 100 years. There is insufficient information to determine whether the other technologies represent reasonable, technically, and economically feasible alternatives to a closed-loop pump storage project. Further, to adequately compare the environmental effects of the other technologies to the specifics of the Goldendale Project requires site-specific information about those technologies and their siting, which is not available for analysis. For these reasons, the EIS continues to decline to assess these technologies further (see Appendix D).

Comment: Several commenters request that the Commission include an alternative site location analysis in the final EIS.

Response: As stated in Appendix D, *Alternatives Considered But Eliminated From Detailed Analysis*, the Commission does not design or site projects. Rather, it determines whether a project as proposed by an applicant can be constructed and operated in a fashion that is in the public interest. No other specific alternative sites or locations for the proposed project are being considered by FFP; therefore, there is no basis on which to evaluate alternative site locations in the EIS. Our environmental analysis considered FFP’s proposal as well as measures recommended by stakeholders, including those that recommended operational design changes, or other measures designed to avoid or minimize impacts to specific resources.

Comment: The Environmental Groups state that “FERC neglected to analyze an alternative that would have powered the project exclusively with renewable energy. Such an alternative could include a power purchase agreement or other mechanism to ensure the project draws its power solely from renewable energy operations. At the minimum, FERC must explain why such an alternative is not feasible—particularly when this project touts itself as one that promotes renewable energy.”

Response: As stated in section 1.2.2, *Need for Power*, FFP proposes to use surplus renewable power for the project to pump water from the lower-elevation reservoir to the higher reservoir during low demand periods and generate power when grid operators need more energy to meet

demand or to balance sudden drop-offs in solar or wind production. Renewable power can include hydropower, wind, and solar. We have no reason to believe that FFP will not use renewable power. Given the project's design, renewables will make up the bulk if not all of that power, particularly as the state reduces its reliance of fossil fuels.

GEOLOGIC AND SOIL RESOURCES

Comment: American Rivers states that the removal of soils within the West Surface Impoundment (WSI) without an exhaustive cleanup plan for the WSI could have significant adverse impacts on Columbia River surface water and groundwater.

Response: As discussed in section 3.3.1, *Geology and Soils, Affected Environment*, the contents of the WSI have been determined not to be hazardous or dangerous. Therefore, it is reasonable to conclude that implementing FFP's proposed Draft Cleanup Action Plan (which includes methods for excavating and disposing of the site contents and addresses monitoring wells associated with the cleanup activities) and FFP's best management practices (BMPs) to control erosion, stormwater, and hazardous spills is sufficient to prevent adverse effects to surface and groundwater resources. A more "exhaustive and final cleanup plan" is not required at this time. As noted in the EIS, FFP will continue to coordinate with Washington DOE as part of the RCRA process to clean up the smelter site to ensure that the project's final construction plans do not interfere with cleanup of the site. This includes negotiating with Washington DOE to develop a Prospective Purchaser Consent Decree and a Revised Remedial Investigation and Feasibility Study to remediate contamination within the proposed project footprint.

Comment: Klickitat County Public Works Department states that FFP must do the following: (1) evaluate roads and bridges used for haul routes using Klickitat County's "Geotechnical Guidelines"; (2) prepare a "Bridge Load Rating Analysis" for any county bridges used as haul routes; (3) prepare a report of the findings that identifies the time of year that hauling for construction can occur and mitigation if the roads or bridges are not adequate to support construction loads; (4) complete a formal "Haul Route Agreement" with Klickitat County prior to the start of construction; (5) meet requirements of the most current versions of the "Washington State Department of Transportation, WSDOT, Standard Specifications for Road, Bridge, and Municipal Construction" for all materials placed on county roads; (5) obtain access permits prior to construction for any new driveways or intersections that access onto county roads; (6) obtain final security and a "Road Haul Agreement" prior to construction to address road maintenance issues and potentials damages that arise during construction; and (7) address dust concerns on their haul routes.

Response: As described in section 3.3.9.2, *Socioeconomics, Environmental Effects*, FFP proposes to work with Klickitat County to obtain an agreement for haul routes and other road use actions as needed for construction. FFP also proposes to develop a construction traffic management plan containing applicable traffic control measures and protocols for coordinating construction schedules, any temporary road or lane closures, and any traffic control measures with Washington Department of Transportation and Klickitat County to minimize disruption of traffic on public roads. However, the level of analysis for the bridges and haul roads recommended by Klickitat County Public Works is not necessary here because that level of

detail will depend on the project's final design. FFP will have to provide the requested information to obtain specific local permits from Klickitat County and the state.

Comment: Dan Hopter expressed concern with the existing fault lines near the project and the potential for flooding of farmers' and ranchers' homes from uncontrolled spill from the reservoirs.

Response: As discussed in section 3.3.1.1, *Geology and Soils, Environmental Effects*, previous geotechnical studies show that the faults in the vicinity of the proposed project are not capable of producing earthquakes that could lead to soil liquefaction or lateral spreading around the reservoirs. Further, 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 would mitigate the risk of dam failure and any subsequent adverse effects on the land and waters.

Comment: FFP clarified that 169,700 cubic yards of materials (rather than the 145,550 cubic yards reported in the draft EIS) would need to be removed from the West Surface Impoundment Site. FFP also states that it is preparing a Revised Remedial Investigation and Feasibility Study in cooperation with Washington DOE and parties involved in cleanup of the CGA smelter site, which is to be completed prior to mobilizing any equipment or personnel to the site.

Response: We revised the final EIS accordingly.

AQUATIC RESOURCES

Comment: FFP clarified that only 10 of the 15 groundwater monitoring wells associated with the rehabilitation of the closed smelter site would need to be decommissioned and replaced.

Response: We have revised the final EIS accordingly.

Comment: NMFS question's staff analysis in the draft EIS that states restricting the timing of water withdrawals would delay the initial fill. NMFS states that the EIS analysis should consider the consumptive water right limit that FFP would be operating under (i.e., 4,137 acre-feet per year) and the fact that FFP proposes to conduct the initial fill over two calendar years. NMFS states its current recommendation for FFP not to withdraw water for project purposes between April 1 and August 31 would still provide a seven-month window for FFP to complete its initial fill (September through March) and would straddle two calendar years. Therefore, NMFS believes its revised 10(j) recommendation to not withdraw water from the Columbia River for the initial fill or periodic make up water between April 1 and August 31 would not delay the initial fill. NMFS also clarifies that the agency is less concerned with the relatively small withdrawals needed for construction activities and is mainly concerned that the applicant avoids the larger withdrawals needed for filling the reservoirs (i.e., the initial fill and annual makeup fill) during salmon migration periods. Interior, American Rivers, and Washington DFW support the revised seasonal water withdraw restriction as recommended by NMFS.

Since issuance of the draft EIS, FFP has agreed not to withdraw water for initial fill any time from April 1 to August 31 consistent with NMFS's recommendation; however, it continues

to oppose any seasonal restriction on utilizing Klickitat PUD water for construction purposes or for refilling the reservoir each year.

Klickitat PUD and Dave McClure from Klickitat County Natural Resources and Economic Development Department state that water for the project will be provided by a service connection to Klickitat PUD's municipal water system and "curtailing use of Klickitat PUD's water right based on the purpose of use instead of priority date would be inconsistent with Washington State's water right framework, which is based on the doctrine of prior appropriation, first in time first in right." Further, Klickitat PUD and FFP state that Klickitat PUD's diversion of water from the Columbia River and exercise of its existing water right are not attributable to the proposed project, and as such they cannot be considered effects of the proposed project.

Response: We revised the final EIS to reflect NMFS's modified recommendations as well as FFP's proposal to adhere to the timing restriction for the initial fill only. As discussed in section 5.1, *Comprehensive Development and Recommended Alternative*, staff now recommends restricting the timing of Columbia River withdrawals for the initial fill to September 1 to March 31 as recommended by NMFS and agreed to by FFP because the restriction would prevent the project's withdrawal from contributing to further reductions in the Columbia River flow that could affect migrating listed salmon and, given FFP's agreement, would not unduly delay the initial fill. However, we also recommend refilling the reservoir outside the migration season to prevent further reductions in the Columbia River flows during the migration season. Accommodating the smaller amounts needed to refill the impoundment should be easier to achieve over the allotted seven-month timeframe than the initial fill. Restricting when the project can withdraw water to fill the reservoir does not affect Klickitat PUD's water right because Klickitat PUD would be free to continue to withdraw water to service its other customers.

Comment: Interior recommends that the final EIS include sufficient detail regarding the amount, timing, and duration of water withdrawals needed for construction activities, initial fill, and make-up water each year.

Response: FFP estimates that it will need 7,640 acre-feet to complete the initial fill, which it now proposes to complete over two calendar years from September 1 through March 31. FFP expects to need 360 acre-feet of water each year to replenish water lost through evaporation and seepage and proposes to maintain flexibility to withdraw that amount when needed (no timing restriction on annual make-up water). While the final EIS does not speculate as to the amount of water needed for construction activities, the amount is typically small and temporary such that it would have a negligible effect on Columbia River flows. In addition, NMFS notes in its June 6, 2023, comment letter that the smaller withdrawals for construction activities are not a major concern to NMFS.

Comment: NMFS states that because FFP does not propose to conduct any in-water work in the Columbia River, it no longer recommends a condition to restrict FFP from placing permanent structures or impoundments in the Columbia River or restrict pile driving.

Response: We have revised the final EIS accordingly. Because the basis of NMFS's initial recommendation to avoid in-water work and installing permanent structures in the Columbia

River was to prevent noise disturbance and predation of listed salmon, we removed the discussion of predation and noise effects from the final EIS.

Comment: NMFS states it recommended an intake pool entrainment study back in 2015 under a prior proposal in the same project area (i.e., filed under the John Day Pumped Storage Hydroelectric Project No. 13333). Therefore, NMFS believes Commission staff's determination in the draft EIS that NMFS's recommendation for an intake pool entrainment study is outside the scope of 10(j) of the FPA because the study should have been requested earlier is "invalid."

Response: NMFS' recommended intake pool entrainment study does not fall within the scope of section 10j, because it is a study that can be physically conducted prior to license issuance without the need for a licensing authorization to complete. Although the recommendation does not fall within the scope of section 10(j), the final EIS still considers NMFS's recommendation under the broad public interest standard of section 10(a)(1) of the FPA. In the final EIS, staff recommends that project water withdrawals occur outside of the peak smolt migration period, and therefore, the project is not likely to contribute to entrainment of smolts into the intake pool. Therefore, we conclude in Appendix G that we have no need for the information that would be generated from the recommended survey and do not recommend it.

Comment: NMFS states that the intake pool will be included in NMFS's action area for an ESA consultation regardless of whether the Commission decides it should be within the project boundary and continues to recommend in its revised 10(j) recommendations that FFP conduct a smolt entrainment study in the intake pool unless FFP and/or Klickitat PUD file a written commitment to screen the known culvert to NMFS's criteria. In its revised 10(j) recommendations, Interior recommends that FFP develop and file with the Commission a water flow and smolt monitoring plan that includes methods for monitoring the water flow rate through the culvert prior to and during water withdrawals, document smolt presence on the river side and intake pool side of the culvert, and provide reports to the agencies. Interior states this plan would be required in years when FFP needs to withdraw water within the smolt migration period (April 1 through August 31) and the culvert has not been screened in a manner consistent with NMFS's screening criteria and no fry and juvenile salmonid surveys have been conducted within the intake pool. American Rivers and the Yakama Nation also recommend that FFP conduct an intake pool entrainment study.

Washington DFW supports a plan to screen the culvert consistent with NMFS's screening criteria and states that this measure "would be sufficient to mitigate some project impacts to salmonid species." Further, Washington DFW states that "fish species documented within the intake pool include piscivorous species that could prey on smolts that become entrained by the culvert and would likely preclude the ability to document any present salmonids."

Klickitat County Natural Resources and Economic Development Department and Klickitat PUD state that they are not aware of any evidence that anadromous salmon are being entrained into the intake pool adjacent to the Columbia River. The County and Klickitat PUD also note that neither the intake pool nor the culvert between the intake pool and Columbia River are owned or controlled by Klickitat PUD. The culvert is potentially owned by the Burlington National Santa Fe Railway, which owns the berm which it penetrates. However, Klickitat PUD also expressed willingness to work with the BNSF Railway company to screen the culvert.

Response: We have revised the final EIS to indicate that Klickitat PUD does not own or control the intake pool or the culvert. Regardless, because we are now recommending that FFP not withdraw water to fill or refill the impoundment during the peak salmon migration period, any salmon that enter the pool and that might be lost to predators would not likely be the result of project operation. Consequently, we conclude in Appendix G that we have no basis for recommending the screening of the culvert, salmon smolt surveys within the pool, or development of a water flow and smolt monitoring plan.

Comment: Interior states that it assumes that Klickitat PUD has conducted periodic maintenance checks of its intake pump station, but that the final EIS should “directly address this assumption.” NMFS, Interior, and American Rivers recommend that FFP ensure that Klickitat PUD’s infiltration gallery is properly maintained and if operational issues are discovered or develop over time, Klickitat PUD and FFP should coordinate with the agencies to improve and/or replace the infiltration gallery with NMFS’s preferred screening methods outlined in NMFS’s 2023 Anadromous Salmonid Passage Facility Design Manual. Interior further recommends that FFP, in conjunction with Klickitat PUD, develop a plan for monitoring the effectiveness of the existing intake screen as well as any screens installed on the culverts within the railway berm over the license term.

The Environmental Groups state that the draft EIS does not adequately address potential impacts to fish species and that the Commission failed to gather “knowable information” such as potential presence of fish species entering the intake pool and potential for entrainment within the intake. They also state that because both FWS and Washington DFW have stated that Klickitat PUD’s intake does not meet NMFS’s criteria, the design “likely is not sufficient to ensure native fish are not entrained or impinged at the facility.” They also comment that “FERC’s approach to assume there is no impact runs counter to the goal of NEPA, which is to disclose the potential impacts and allow for the meaningful consideration of what the project will do to the environment, in contrast to other alternative courses of action.”

The Yakama Nation states that it will “not accept unenforceable promises of future intake screening or limited withdrawals during juvenile salmonid migration season as a fictional environmental evaluation for the purposes of expediting this DEIS with incomplete or inaccurate information.”

Response: As stated in the draft EIS and as a general matter, if a license is issued, the Commission will determine what facilities should be licensed and included within the project boundary. Appendix G states that if the Commission determines that Klickitat PUD’s infiltration gallery, pumping station, and the BNSF-owned culvert should not be included in the license as project facilities, the Commission would have no basis for requiring FFP to coordinate with the agencies to ensure that the infiltration gallery is maintained and meets NMFS’s screening criteria or to recommend a plan for monitoring the effectiveness of the existing infiltration gallery and any screens installed on the culvert. If the Commission determines that the infiltration gallery, pumping station, and culvert should be included as licensed project facilities, then FFP could be required to ensure that they are maintained. However, there is no information in the record that suggests that Klickitat PUD’s infiltration gallery is not operating as intended or would require repairs or modifications in the future. Regardless, fry and juvenile anadromous fish that enter the intake pool are unlikely to 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 which should be impenetrable to fry. In addition, we note that Interior states in its letter commenting on the draft EIS that "while [an] infiltration gallery is not the preferred method of fish screening, the FWS acknowledges that it has been reviewed by engineers and deemed sufficient to mitigate entrainment concerns, in this case." Therefore, we have no basis for recommending that the FFP modify Klickitat PUD's intake and infiltration gallery.

Comment: NMFS disagrees with the draft EIS's assertion that smolts that enter the intake pool would only be lost when the hydrologic connection between the pool and Columbia River is lost (i.e., when intake pool water level drops below the culvert elevation on the intake pool side). NMFS states that any smolts that enter the intake pool would likely be lost to predation, which it considers to be "take."

Response: Staff agree that any fish that enter the intake pool may be vulnerable to predation by piscivorous fish and birds and have revised the final EIS accordingly. However, that predation would likely occur regardless of whether the proposed project is constructed because Klickitat PUD is serving other customers from this facility, and it is reasonable to conclude that it will continue to seek other customers for its available water right regardless of whether the project is built. As discussed above, staff is now recommending that the initial fill and refill of the project reservoirs occur outside the peak juvenile salmon migration period; therefore, project operation would not likely contribute to entrainment of smolts within the intake pool.

Comment: NMFS requests that the Commission provide a source for the following statement: "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."

Response: As stated in 3.3.3.1, *Aquatic Resources, Affected Environment*, FFP described the existing fish community in the intake pool in its Pre-Application Document which was based on an aquatic reconnaissance survey it conducted on May 4, 2015, and anecdotal angling information. The EIS has been revised to clarify that how these fish enter the pool is unknown.

Comment: NMFS and Interior state that while there is one confirmed submerged culvert between the Columbia River and the intake pool, there is potentially a second submerged culvert that also provides a hydrologic connection between these two bodies of water. The agencies state that the EIS should be revised to clarify the potential existence of the second submerged culvert and the culvert diameter should be given along with the culvert length.

Response: Section 3.3.3.2, *Fisheries Resources, Environmental Effects*, clearly states that historical information from the BNSF railway company suggests the potential presence of two 42-inch culverts within the railway berm; however, FFP's visual inspections and an investigation with an underwater remotely operated vehicle could only locate one culvert in the railway berm. However, we have revised the final EIS to indicate that the diameter of the known culvert is 42 inches and that the approximate length of that culvert is 120 feet from end to end.

Comment: NMFS states that the minimum flow targets for the Columbia River system near the project are not set annually by the Technical Management Team as stated in section 3.3.3.2,

Fisheries Resources, Environmental Effects, but are instead set by the water supply forecast (i.e., the projected runoff volume).

Response: We have revised section 3.3.3.2 of the final EIS accordingly.

Comment: NMFS states that “FERC’s argument that NMFS has already accounted for the project’s consumptive use impacts on ESA-listed salmon and steelhead in the Columbia River because flow objectives were developed after KPUD’s water right priority date (2008 and 1969, respectively) is flawed and should be amended.” NMFS clarifies that the flow objectives for the Columbia River should be interpreted as a “minimum biological guideline” based on the biological response of juvenile salmon and steelhead to river flows and should not be interpreted as baseline conditions for the Columbia River system. Further, NMFS states that the flow guidelines are “designed to guide pre-season reservoir planning and in-season flow management decisions, not to justify the continued diminution of flows until thresholds are reached.”

Response: Section 3.3.3.2, *Fisheries Resources, Environmental Effects*, states that the water for the project would be purchased from Klickitat PUD under its existing water right that was in place prior to the minimum flow targets being established for the Columbia River. The purpose of this statement is to provide context showing that the project would not result in any new water appropriation, meaning that the water can be withdrawn by Klickitat PUD with or without the project. When analyzing the potential effects of project water withdrawals on Columbia River water quantity, staff compared the rate and volume of water needed for project purposes with the baseline conditions expected in the Columbia River using flow data from the nearest USGS gage, not minimum flow targets. Our analysis continues to find that even though the withdrawals would add to ongoing losses occurring from irrigation and other withdrawals in the basin, the project withdrawals are relatively small temporary withdrawals. Nonetheless, because, as discussed above, we are now recommending that FFP not fill or refill the impoundment between April 1 and August 31, project operation would not contribute to Columbia River flow reductions during the peak salmonid smolt migration period and thus would not impede ESA-listed salmon smolt migration.

Comment: NMFS states that the project will “further exacerbate the already substantial flow reductions” in the Columbia River and that the Commission’s analysis should be expanded to address the project’s impacts when added to the other existing water withdrawals. NMFS notes that there are many tools and resources available to help better understand, and even estimate, the impacts of Columbia River water withdrawals on salmon and steelhead smolt travel times and survival such as the Comprehensive Passage (COMPASS) Model developed by NMFS’s Northwest Fisheries Science Center. NMFS states that reduced spring/summer Columbia River flows increases the time and energy it takes juvenile salmonids to travel from their natal to ocean habitat, which increases their exposure to native and nonnative predators and reduces their survival rates (lower smolt-to-adult returns). Additionally, NMFS comments that reduced spring/summer flows can decrease access to shallow water habitat along the riverbank, decrease shoreline invertebrate prey availability, decrease turbidity which further increases vulnerability to visual predators, and decrease the size of the Columbia River plume, a key transitional habitat from the river to the nearshore oceanic environment. Further, NMFS states that because the intake pool is hydraulically connected to the Columbia River, a drawdown of the intake pool water level would “result in an increase in flow out of the Columbia River and into the KPUD

intake pool until the two bodies of water equilibrate” which would increase the likelihood of smolts entering the intake pool, particularly during periods when smolts are likely migrating. NMFS notes that “a daily average of 32,709 salmon and steelhead smolts are estimated to pass the section of the Columbia River immediately adjacent to the KPUD intake pool from 1 April to 31 August. This value can be as high as 445,165 smolts on a single day during this period of time.” NMFS also states that if the Commission were to adopt its recommendation to limit the timing of project water withdrawals, the project “would not contribute to the cumulative reduction in spring and summer flows in the lower Columbia River and additional, expanded analysis of this issue would not be necessary.”

The Yakama Nation also express concern with the 7,640 acre-feet of water that would be taken from the Columbia River “during periods of annual low water level where multiple ESA-listed species are already subject to unacceptably high mortality due to cumulative effects of higher water temperature, lower stream connectivity and available habitat, greater predation, and man-made migration obstacles.”

Response: For the reasons already discussed, we have adopted NMFS’s recommendation to limit the timing of withdrawal to fill and refill the reservoirs; therefore, the project would not contribute to flow reductions during the peak salmonid smolt migration period and no further analysis needed.

Comment: American Rivers and several citizens expressed concern with the release of turbid, nutrient-rich, warm, and potentially hazardous effluent into the river. American Rivers supports NMFS’s prior recommendation that FFP not be permitted to release any effluent discharge into the Columbia River during construction or operation. Further, American Rivers recommends that FFP “have an emergency plan in place to ensure that the project construction and operation does not result in discharge to the Columbia River.”

Interior states that the draft EIS does not appear to indicate how or where spilled water would be directed to the Columbia River.

Bryce Campbell states that the draft EIS did not appropriately address “mass releases of water from the storage pool” which he states could cause changes in downstream flow rates and affect turbidity in the Columbia River.

Response: Section 3.3.2.2, *Aquatic Resources, Environmental Effects*, addresses potential project effects on water quality. While FFP does not propose to discharge water in the Columbia River during the construction or operation phases, we cannot completely rule out the potential for an unanticipated discharge from occurring. However, FFP’s proposed standard erosion control, stormwater pollution prevention, and hazardous spill control measures during construction should minimize potential effects on water quality in the Columbia River and other surface waters. FFP’s proposed Dewatering Plan would allow FFP to collect and monitor groundwater during construction and ensure that its contents are not contaminated, and the proposed reservoir liners would minimize leakage and ensure that project contents do not degrade groundwater quality. Further, FFP’s proposed Reservoir 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. Regarding American Rivers' recommendation that FFP develop an emergency plan, we note that Emergency Action Plans (EAPs) are an integral part of the Commission's dam safety program and thus would be required to be filed prior to operation. Filing requirements for EAPs are described in Part 12, Subpart C of the Commission's regulations (*see also* <https://www.ferc.gov/industries-data/hydropower/dam-safety-and-inspections/eng-guidelines>). Therefore, no revisions to the final EIS are needed.

Comment: Delmar Elthad is concerned about the ecological effects of installing large pumps in the Columbia River for filling the reservoirs and the fact that there will likely be "massive water evaporation" in the summer months that would reduce generation in those months.

Theone Wheeler states that the draft EIS "does not fully consider the impacts of the pipeline going into the Columbia River and how that will affect all the endangered aquatic life."

Response: As discussed in section 2.2, *Applicant's Proposal*, FFP does not propose to install any new water pumps or water lines in the Columbia River but would instead utilize existing infrastructure owned and operated by Klickitat PUD to complete the initial fill and to replace water lost due to evaporation and seepage. Regarding make-up water, FFP anticipates needing approximately 360 acre-feet annually to replace reservoir water lost due to evaporation and/or seepage. Therefore, FFP does not anticipate losing the potential to generate during the warm summer months when evaporation rates are higher.

Comment: Interior recommends that Commission staff include a "robust analysis" of cumulative effects to water resources (including groundwater, water quantity, and water quality) in the final EIS.

Response: Staff addressed the potential effects of the proposed project on water quality, water quantity, and groundwater in section 3.3.2, *Aquatic Resources*. As discussed previously, the proposed project would not result in any new water appropriation, meaning that the water can be withdrawn by Klickitat PUD with or without the project. Staff's analysis of both the rate and volume of water needed for project purposes found that even though the withdrawals would add to ongoing losses occurring from irrigation and other withdrawals in the basin, the project withdrawals are relatively small, temporary withdrawals. However, as discussed above, FFP has agreed not to withdraw water for the initial fill during the salmon migration season and staff is now recommending that any water needed to refill the reservoirs also not be withdrawn during the salmon migration season. This will prevent project operation from contributing to flow reductions in the Columbia River when salmon are migrating and any concomitant cumulative effects on water quality. In addition, FFP's proposals to collect and monitor groundwater during construction and ensure that its contents are not contaminated as well as sealing and lining the reservoirs would prevent seepage into the groundwater and ensure that project contents do not degrade groundwater quality. FFP's proposed Reservoir 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. Thus, no changes to the final EIS are needed.

TERRESTRIAL RESOURCES

Comment: The Environmental Groups comment that the project would permanently destroy large segments of unique waterbodies (including waters of the U.S.) and cause downstream impacts to perennial waterbodies.

Response: We do not reach this conclusion in the final EIS. Potential effects of the project on wetlands and other surface waters are discussed in section 3.3.2.2, *Aquatic Resources, Environmental Effects*, and section 3.3.4.2, *Terrestrial Resources, Environmental Effects*. Construction of the upper and lower reservoirs would result in the filling and permanent loss of approximately 1.15 acres of ephemeral streams and associated stream buffers; however, FFP's proposed wetland mitigation measures such as establishing and rehabilitating a new stream course if possible and using construction BMPs to minimize adverse effects on downstream wetland functions and aquatic habitats would minimize adverse effects on streams and wetlands. Further, FFP's proposed erosion and sediment control plan, Spill Prevention Plan, and Stormwater Pollution Prevention Plan would contain standard provisions known to minimize construction-related effects on surface waters.

Comment: FFP states that the draft EIS contains outdated and/or inaccurate descriptions of Wetland A, Wetland B, Stream 1, and Stream 2. FFP's states that all references to these wetland and stream features should be removed from the EIS and recommends adding a footnote that says the following: "FFP states that while Wetland A, Wetland B, Stream S1 (also noted as Stream 1) and S2 (also noted as Stream 2) were resources contained in the original source material, they were later confirmed by additional studies including the USACE Jurisdictional Determination and the Washington DOE-approved Wetlands and Waters Delineation Report Rev 3 not to exist. The Applicant's consultant ERM's Wetlands and Waters Delineation Report Rev 3 as approved by the Washington DOE represents the most current and accurate descriptions of wetlands and waters within the project boundary."

Response: After reviewing FFP's Wetlands and Waters Delineation Report Rev 3 and updated jurisdictional wetland determination forms filed on October 10, 2023, we have revised the final EIS text to remove references to Wetland A, Wetland B, Stream 1, and Stream 2 and adjusted the numbers of project area wetlands and streams accordingly. However, because we used figures from Washington DOE's Final EIS that we could not modify, they still show the wetlands/streams determined not be jurisdictional.

Comment: Rebecca Sue Sonniksen states that, to mitigate wildfire risk, FFP must be required to have on-site firefighting equipment and pump trucks.

Response: Staff recommend in section 5.1, *Comprehensive Development and Recommended Alternative*, that FFP modify its proposed Vegetation Management Plan to include protocols for preventing and controlling wildfires during project construction and operation. The focus of such efforts is to ensure sufficient transmission line clearance, reduce wildfire fuel loads, and minimize potential for wildfire ignition. Licensees keep standard firefighting equipment (e.g, fire extinguishers) readily available during construction and operation. Pump trucks are specialized equipment that are not necessary to be kept on-site. Rather, licensees would

coordinate and timely notify local fire departments when such equipment is needed. Therefore, no changes to the EIS are needed.

Comment: American Rivers states that special status and culturally important plants described in section 3.3.4.1, *Terrestrial Resources, Affected Environment*, (such as smooth desert parsley, biscuitroot, and serviceberry important to the Yakama Nation) should also be analyzed in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*. American Rivers also recommends that FFP be required to consult with affected Tribes during the development of the Vegetation Management and Monitoring Plan.

Response: Potential effects of the project construction and operation on vegetation (including special status and cultural significant plants) is described in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*. Project construction would temporarily disturb 54.3 acres of vegetation and remove 193.6 acres of habitat, some of which could support culturally significant plants traditionally collected by Tribes for food and medicine gathering activities. Staff recommends in section 5.1, *Comprehensive Development and Recommended Alternative*, and in Appendix G that the Vegetation Management and Monitoring Plan include a provision to survey for state and federal listed plants in the spring and in the summer prior to beginning construction and to include shrubs and species of traditional cultural importance in the revegetation seed mix if they are available. We revised our recommendation to require FFP to develop the plan in consultation with the affected Tribes.

Comment: The Yakama Nation states that the EIS fails to address effects on ferruginous hawks. The Yakama Nation states that the project site is preferred habitat for ferruginous hawks and that these hawks could be directly impacted from wind turbine strikes and could be displaced by project construction if they nest in the area.

Response: The EIS identifies ferruginous hawks as a raptor species known to inhabit lands in the project vicinity and analyzes potential project effects to this species and other raptors. The effects on ferruginous hawks would be like those described for other raptors. Regardless, we revised our recommendation to specifically include pre-construction surveys for ferruginous hawks (in addition to surveying for peregrine falcons and other raptor species already identified in the plan) and to take steps to avoid disturbing nesting ferruginous hawks during construction if they are found. Further, monitoring the effectiveness of the wildlife deterrents and developing an avian protection plan for the project transmission line that includes procedures for monitoring bird fatalities and addressing problem poles would minimize adverse effects on ferruginous hawks and other raptors.

Comment: The Environmental Groups, the Yakama Nation, and TID comment that the draft EIS does not adequately address impacts to birds (e.g., peregrine falcons, golden eagles, prairie falcon) and bats. Columbia Riverkeeper states that “a thorough environmental study should be required to inventory all bird species, bats, mammals, reptiles, amphibians, and plant life.” The Environmental Groups state there is no analysis of the potential impact to bat and bat populations from construction activities and that the draft EIS is “devoid of any analysis of the scope or extent of the potential impacts on individual bats or the populations as a whole.”

Response: The EIS discusses potential project impacts to birds, raptors, bats, and other wildlife in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*. The analysis acknowledges that project construction would remove habitat that could be used by raptors and bats, displace nesting raptors, and create habitat that could attract raptors and bats that could potentially expose them to wind turbine strikes and barotrauma. The EIS also recommends a suite of measures to minimize the effects (e.g., pre-construction surveys and avoidance measures, use of shade balls on the reservoirs, avian protection plan, etc.). NEPA does not require a complete inventory of all plants and animals to identify and analyze the potential effects on wildlife. Rather, it requires that the analysis take a hard look at the project effects, which the EIS does. The commenters do not propose any specific effects or measures to birds, raptors, bats, and other wildlife that have not already been considered. Therefore, no changes to the final EIS are needed.

Comment: The Umatilla Tribes states that the wildlife protection measures for the project are important to the Tribe and request that the Tribe receive any monitoring reports of wildlife mortalities, and accounts of successes, failures, and any changes to the mitigation efforts.

Response: The final EIS recommends that the annual monitoring reports be provided FWS, Washington DFW, Oregon DFW, Yakama Nation, Umatilla Tribes, the Warm Springs Tribes, and Nez Perce Tribe;

Comment: TID states the increased presence of avian species and their prey due to the project reservoirs would increase bird and bat deaths leading to fines for TWPA, damage to the turbines, and likely cause TWPA to reduce or cease its operation of one or more turbines due to avian strikes. TID reiterates its recommendation that FFP be required to conduct a baseline and annual study investigating raptor and bird strikes and also recommends that the Commission require FFP to enter into an agreement with TWPA providing that, if the project reservoirs cause an increase in golden eagle strikes above the average that TWPA has experienced under the relevant baseline study data, FFP would be required to implement proactive measures to prevent these strikes from continuing to occur and “compensate TWPA for any losses, penalties, costs, or damages that TWPA experiences due to such strikes.”

Response: As discussed previously, the EIS already addresses potential effects of bird and bat attraction to the reservoirs and interaction with nearby wind turbines as well as appropriateness of FFP’s proposed wildlife deterrent measures. We continue to find that requiring FFP to revise the Wildlife Management Plan to include methods for monitoring and documenting bird and bat use before and after constructing and filling the reservoirs, metrics for evaluating the effectiveness of the FFP’s proposed deterrents (such as installing fences, shade balls in the reservoirs, etc.), criteria for deciding whether additional deterrents or modifications to the project are needed, and consulting with TID on any bird and bat fatality observed at the wind farm should be sufficient to determine whether the project is causing an increase in risk to eagles without requiring a baseline study and conducting annual monitoring for the life of the license as recommended by TID at an annualized cost of \$21,087. Therefore, no changes to the final EIS are needed. Regarding TID’s recommendation that FFP be required to “compensate TWPA for any losses, penalties, costs, or damages that TWPA experiences due to such strikes,” as stated previously, the Commission does not have authority to adjudicate claims, or to require payment of damages, for project-induced adverse effects to property of others. Rather, if TID or TWPA

believe that their turbines are being adversely affected by operation of the Goldendale Project, they can seek redress with FFP in state court.

Comment: Oregon DFW states it recommends FFP's measures to minimize avian electrocution and collision hazards with the project transmission line and staff's measure to develop an avian protection plan.

Response: We have revised the final EIS to indicate that Oregon DFW recommends these measures.

Comment: Rebecca Sue Sonniksen recommends that FFP arrange with Dr. Jean Cypher of Rowena Wildlife Clinic in Oregon for the emergency care of injured birds and wildlife.

Response: FFP proposes as part of its Wildlife Management Plan to develop a reporting system to document wildlife mortalities, injuries, nuisance activity, and other wildlife interactions. In addition, staff recommends that FFP develop an avian protection plan that includes procedures for documenting and reporting bird mortalities and problem transmission line poles consistent with APLIC guidelines. We recommend that FFP consult with Washington DFW, FWS, and Oregon DFW to revise the Wildlife Management Plan and to develop the avian protection plan. That consultation should identify the appropriate parties to notify when injured wildlife are encountered.

Comment: Friends of the White Salmon River state that FFP's proposal to acquire and manage 277 acres of off-site land for the benefit of golden eagles is "theoretical" because the acres have not been identified or purchased yet and, thus, there is no certainty that this mitigation will even happen. Similarly, the Environmental Groups state that any benefits from an undefined mitigation project that the applicant possibly may undertake for offsetting impacts are "purely speculative."

Response: As stated in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, FFP is working with Washington DFW and FWS to identify suitable lands and would select parcels to offset impacts to golden eagle habitat that would include a golden eagle nest and/or foraging habitat within 6 kilometers 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 Washington DFW lands. The project record indicates that such lands exist near the project. In section 5.1, *Comprehensive Development and Recommended Alternative* and in Appendix G, staff recommend that FFP develop a management plan for the mitigation land that would identify the parcels to be acquired, the habitat values of the land, and the habitat improvements that would be implemented on each parcel. Should these measures become conditions of any license issued for the project, then FFP would be required to acquire the rights to these lands and develop the management plan before it could begin construction. Therefore, the measures are not "theoretical" or "speculative."

Comment: The Environmental Groups comment that the draft EIS does not contain a meaningful analysis of impacts to terrestrial mammals (e.g., western gray squirrel). They state that the project has the potential to increase key identified threats to western gray squirrels in Washington State, including habitat destruction and degradation from development and forest

management, roadkill mortality, and wildfire risk. The Environmental Groups also state that the planned construction will occur during western gray squirrel breeding seasons and when juveniles are emerging from nests and that “such disturbance during these key periods in the squirrels’ life cycles could have significant impacts on the squirrel population in the region.”

Response: Section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, describes potential project effects on terrestrial mammals. As indicated in table 3.3.4-4 in Appendix B, populations of western gray squirrel are known to exist in the oak woodlands northeast of the project; however, as recently reported in Washington DOE’s EIS for the Goldendale Project, the Washington DFW states that the western gray squirrel is unlikely to occur in the project area because its habitat is not present. We concur. Because the western gray squirrel’s habitat is not present, project construction would not affect the western gray squirrel or contribute to its habitat destruction. We revised table 3.3.4-4 accordingly. No further analysis is needed.

Comment: Interior recommends the final EIS include a “cumulative effects discussion associated with direct, indirect, and cumulative impacts of adding transmission lines in the Columbia Basin and in the project vicinity.”

Response: The majority of the overhead project transmission line (3.13 miles of the 3.4 total) would use existing and available circuits on the existing Bonneville Power Administration (BPA) towers within an existing BPA right-of-way rather than installing new towers. As discussed in section 3.3.4.1, *Terrestrial Resources, Affected Environment*, most of the proposed transmission lines would be located within previously developed or disturbed land, including lands occupied by former Columbia Gorge Aluminum (CGA) smelter operations and crossed by major roads such as SR 14. We discuss the cumulative effects of the addition of the project transmission lines on raptors in section 3.3.4.3, *Terrestrial Resources, Cumulative Effects*. The discussion focuses on the adverse effects on raptors because of the additional electrocution and collision hazards for raptors. While the project would add additional conductors in the immediate project area, it would not significantly contribute to adverse effects of existing transmission lines for the reasons noted above. Interior’s comments do not explain what other effects should be considered. Thus, no changes to the final EIS are needed.

THREATENED AND ENDANGERED SPECIES

Comment: Interior states that the project is within the spring and summer occupancy zone for the western monarch butterfly, a candidate species under the ESA, which migrates to the Pacific Northwest to nectar, breed, and lay eggs on their host plant (milkweed). Interior notes that two milkweed species utilized as habitat for the butterfly (i.e., narrow-leaved milkweed and showy milkweed), are found along waterways in Klickitat County. Interior recommends that FFP conduct pre-construction surveys for the species and its habitat and if individual butterflies or milkweed habitat are found, the licensee work with the FWS and any other relevant resource agencies to develop a “monarch management plan” that includes mitigation for impacts to milkweed habitat.

Response: The EIS addresses potential project effects on the candidate monarch butterfly in section 3.3.5.2, *Threatened and Endangered Species, Environmental Effects*. The analysis acknowledges that it is unknown whether the project site contains the butterfly or milkweed that

would support the butterfly. Because the presence of the butterfly and milkweed can change annually, staff recommends that FFP survey for the butterfly and milkweed prior to construction. We also revised section 5.1, *Comprehensive Development and Recommended Alternative* and Appendix G to recommend that FFP develop a monarch butterfly management plan that includes 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.

RECREATION, LAND USE, AND AESTHETICS

Comment: Interior states that the project is located along and crosses portions of the Lewis and Clark National Historic Trail and the "Auto-Tour Route" for the trail (specifically State Route 14 in Washington along the north side of the Columbia River and Interstate 84 in Oregon along the south side of the Columbia River). To minimize potential visual and recreational impacts to the trail, Interior recommends that a copy of FFP's visual and recreation resource management plan be provided to the National Park Service for review and comment. Interior states that park service staff can advise FFP on textures, lines, colors, and forms of project components to minimize negative impacts to the Lewis and Clark National Historic Trail and has expertise with respect to location and content of interpretive signage and communications with the public/visitors.

Rebecca Sue Sonniksen states that FFP needs to provide details regarding its proposed interpretive facility and consult with Tribes on its content to ensure it communicates the "cultural heritage and significance of the area."

Response: Because the National Park Service and Tribes have unique expertise and experience that could further minimize the project's effects on the trail and improve public awareness of the Tribes, we have revised section 5.1, *Comprehensive Development and Recommended Alternative*, and Appendix G to recommend that FFP consult with the National Park Service and the Tribes in developing its visual and recreation resource management plan.

Comment: TID contends that the analysis in the draft EIS regarding compatibility of the project with existing wind energy development is "inaccurate because it inappropriately accepts the findings of 2021 WREA Study Report, which is fundamentally flawed." TID contends that FFP's wind resources effects analysis study report relies on "insufficient and inapplicable data," relies on "insufficient turbine generation data," and does not incorporate an uncertainty analysis, all of which lead to the report underestimating the anticipated effects of the project on wind patterns and wind turbine output. TID states "because the WRF model only used one year (2014) of 80-meter Met Tower data, and because the Met Tower is located at an elevation that is 100 meters or more below all but two of the turbines near the upper reservoir, this Met Tower data is worthless and cannot be relied upon." TID also states that had the study incorporated a larger dataset (rather than only two higher generation years), then average assumed wind speeds would have been much lower and the wind speed and wind direction changes identified in the model would have demonstrated a "more significant effect on these wind patterns" than what was presented in the study. Further, TID states "when the 2021 WREA Study Report's findings are applied to the power curves for TWPA's turbines, it is apparent that the GES Project will significantly reduce their energy output" and that the "2021 WREA Study Report's findings significantly understate the effects that the GES Project will have on TWPA's turbines because

these findings are based on extremely limited, ‘cherry picked’ and erroneous data, as well as faulty assumptions and unproven study methodologies.” For these reasons, TID states that the Commission should reject the 2021 wind resources effects analysis study report and require FFP to conduct a new, independent study. Additionally, TID states that when it applies the root mean square error identified in the report to the power curves for TWPA’s turbines, the reduction in wind speed caused by the upper reservoir would “reduce each affected turbine’s output by thousands of megawatt hours resulting in each experiencing hundreds of thousands of dollars in lost generation revenues.”

In reply comments, FFP states the wind and turbulence data sets showed some clear impacts on the winds near and below 40 meters with the greatest impacts occurring directly over the proposed reservoir and that these impacts on both wind and turbulence decreased with height and horizontal distance with minimal impacts found over the adjacent wind farm. FFP states that TID offers no new or different evidence or legal arguments for its assertion that the Commission should require FFP to conduct the new modeling study by a third party chosen by TID.

Response: The draft EIS considered the results of FFP’s Wind Effects Analysis Report as well as TID’s comments in the analysis of whether constructing and operating the project would result in changes to wind patterns (i.e., wind speed, direction, and turbulence) to a degree that adjacent areas would no longer support wind farm operation. The analysis in section 3.3.6.2, *Recreation and Land Use, Environmental Effects*, acknowledges that some increases and decreases in wind speeds and turbulence are likely due to the presence of the upper reservoir, but on average the changes are close to zero and would be confined to near the ground surface (below the elevation of the existing wind turbines) and that these changes are expected to decrease with height. While some changes to individual wind turbine output and/or efficiency cannot be completely ruled out (particularly for the two turbines located closest to where the upper reservoir would be built), it is reasonable to assume the project would not impact wind conditions to a degree that would make the project incompatible with the adjoining wind farm operation. For these reasons, we do not recommend further studies as recommended by TID.

Comment: TID states that the 2021 Wind Effects Analysis Report does not adequately analyze the project’s effects on golden eagles.

Response: These issues are addressed in in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, and further discussed above.

Comment: TID reiterates its concerns that the project reservoirs could saturate the foundations of the wind turbines which could damage the turbines, increase the need for maintenance and repairs, reduce the turbines’ design and service lives, and invalidate TWPA’s warranties on the turbines.

Response: As described in 3.3.2.2, *Aquatic Resources, Environmental Effects*, FFP would use a geosynthetic layer and a waterproof concrete liner on the lower reservoir and a hydraulic asphalt concrete (HAC) layer overlying an asphaltic base layer (ABL) on the upper reservoir to minimize leakage. 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 sumps located at the low

points of the reservoir, where the water would be monitored and pumped back into the reservoir. Furthermore, FFP proposes to develop a construction monitoring program during the project's final design in consultation with TID. These measures should minimize the potential for leakage that could damage wind turbine foundations. As discussed previously, if TID believes that adverse effects are occurring to its wind turbines, they can seek redress with FFP in state court.

Comment: TID recommends that the Commission require "one or more independent studies" that consider the potential damage to its existing wind turbines that could result from vibrations produced by the project's construction. TID states that construction vibrations could damage or interfere with the operations or output of the turbines during excavation or drilling. TID also recommends a process to be compensated if the mitigation measures identified in the new studies fail, causing them to suffer losses or other damages.

Response: As discussed in section 3.3.6.2, *Recreation and Land Use, Environmental Effects*, project construction would require drilling and blasting, which would create underground vibrations near some of the existing wind turbines, particularly one turbine that is currently located immediately above where the proposed headrace tunnel would be constructed. Much of the geotechnical information needed to determine at what level vibrations created during construction may affect nearby wind turbine foundations would be gathered during final design. Regardless, FFP's proposed construction vibration monitoring program would include a baseline survey and assessment of existing utilities, a map of existing utilities, vibration monitoring methods, criteria for evaluating vibration levels, and identifying potential mitigation measures based on the monitoring results. These measures should minimize vibration effects on nearby wind turbine foundations and would likely achieve the same outcomes of requiring TID's recommended study. For these reasons, we do not recommend a separate or duplicative vibration study in section 5.1, *Comprehensive Development and Recommended Alternative* and in Appendix G. As discussed previously, if TID believes that adverse effects are occurring to its wind turbines, they can seek redress with FFP in state court.

Comment: TID states that the draft EIS should be modified "to make construction of the project contingent on: (1) TWPA consenting to the project proceeding; (2) FFP demonstrating that it has taken the necessary actions identified by TID, TWPA, and Siemens to prevent the GES Project from invalidating Siemens' warranties on TWPA's turbines; and (3) FFP entering into an agreement with TWPA that would make FFP and the project liable for any damages or other losses resulting from the invalidation of Siemens' warranties due to the construction of the project."

Response: As discussed above, FFP's proposed measures are not expected to result in changes to wind patterns (i.e., wind speed, direction, and turbulence) to a degree that adjacent areas would no longer support wind farm operation. If TID believes that adverse effects are occurring to its wind turbines, they can seek redress with FFP in state court.

CULTURAL RESOURCES

Comment: The Yakama Nation, Interior, the Umatilla Tribes, Warm Springs Tribes, and several individuals state that the Commission has a duty to uphold the 1855 treaties between the United States government and local Tribes. Interior states "as part of the Yakama Treaty, the Treaty of

Walla Walla, the Nez Perce Treaty, and the Treaty with the Tribes of Middle Oregon, 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 Tribes protect the rights reserved by them in their respective treaties.”

During the draft EIS public meetings, several commenters emphasized the importance of traditional use of the project area, including gathering food and medicinal plants and spiritual activities. They also expressed frustration that landowners in the vicinity of the proposed project have not permitted them to gather plants due to trespass issues. Interior recommends that the project license require that Tribal access to the project area for traditional purposes is not “hindered, encumbered, or otherwise interfered with during all phases of project construction, operation, and maintenance.”

An individual citizen from the Yakama Nation states that the proposed project is “already on land where we have no access to” for root gathering and hunting activities and expressed general support for the potential employment opportunities the project would bring.

Response: Section 3.3.8, *Cultural Resources*, contains a discussion of the cultural context of the project area and describes the 1855 Yakama Treaty, the Treaty of Walla Walla, the Nez Perce Treaty, and the Treaty with the Tribes of Middle Oregon.

The 1855 treaties permit the Tribes to fish, hunt, and gather plant resources in all “usual and accustomed places” that are “open and unclaimed” lands. The lands on which the project would be constructed are privately held and are therefore not “open and unclaimed.” The Commission does not have the authority to require adjacent landowners that could contain resources important to the Tribes to provide access to their lands for traditional purposes.

Comment: The Yakama Nation and the Environmental Groups state that the Commission may not delegate its NHPA section 106 consultation responsibilities to the applicant. The Yakama Nation, Umatilla Tribes, the Environmental Groups, and Interior state that they do not believe that the Commission has conducted adequate government-to-government consultation with the participating Tribes. EPA commented that the final EIS should describe the opportunities that were provided to the Yakama Nation and other Tribes for direct government-to-government consultation. Interior states that the *ex parte* rules should include flexibility to conduct off-the-record consultation regarding sensitive Tribal issues. Julie from Eugene, Oregon (no surname listed), requests that Commission staff “define tribal consultation that is required by NEPA,” state whether tribal consultation was completed “as defined by NEPA,” and explain why the project is moving forward when there are “alternatives that have been recommended by tribes.” The Mid-Columbia Economic Development District, encourages “ongoing engagement between the Federal Energy Regulatory Commission and the four Treaty Tribes of the Columbia Gorge to ensure they are involved in the licensing process as Sovereign, including but not limited to access that respects traditional gathering areas.”

Response: Section 106 of the NHPA and its implementing regulations (36 C.F.R. § 800.2(c)(4)) allow the Commission to authorize an applicant for a new license to initiate consultation with the state historic preservation office (SHPO), Tribes, and others. However, as acknowledged in the

final EIS, the Commission remains ultimately responsible for all findings, determinations, and government-to-government consultation. As outlined in section 1.4, *Tribal Consultation*, Commission staff offered to meet with the affected Tribes during both the development of the license application (pre-filing) and after the application was filed. Commission staff also understand that the Yakama Nation does not feel that the Commission's efforts were sufficient. Commission staff are seeking ways to further those discussions so that the Commission can consider any more information that the Tribes may wish to offer. However, Commission staff are bound by our *ex parte* rules, which ensure that all parties to the proceeding are aware of the information that may have a bearing on the Commission's decision. On October 18, 2023, Commission staff sent a letter suggesting a way to consult with the Tribes that would be consistent with the Commission's *ex parte* regulations. After the Umatilla Tribes expressed a desire to meet, Commission staff issued a notice of the meeting on November 29, 2023, and met with the representatives of the Umatilla Tribes on December 13, 2023.

Comment: The Yakama Nation state that the draft EIS does not adequately address the significance of cultural resources within the project Area of Potential Effect (APE). The Umatilla Tribes state that it has demonstrated an ongoing cultural relationship to *Pushpum* and *T'at'aliyapa* and that if the project is constructed, it will sever that link which connects the traditions of the past to present tribal members.

Response: Section 3.3.8, *Cultural Resources*, describes traditional cultural properties (TCP) and historic use of the project area, including food gathering and ceremonial and spiritual practices by the Yakama Nation, Umatilla Tribes, and Nez Perce based on ethnographic studies completed by or in consultation with the respective Tribes. It also acknowledges that the Yakama Nation and Umatilla Tribes believe 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. If the Tribes wish to provide more information on the importance of the area, they can do so as described in our December 9, 2021 letter to the Yakama Nation. Without more, we have no basis to revise the EIS.

Comment: The Umatilla Tribe states that in the discussion of Effects on Access to Usual and Accustomed Gathering Sites, the draft EIS states that the project would not be located on land that is directly adjacent to the Columbia River and that through-traffic on John Day Dam Road, which is used to access a Tribal traditional fishing site, would not be limited at any time during both construction and operation. The Umatilla Tribe notes, however, that in the discussion of traffic effects, the draft EIS states that construction activities would result in increased traffic on area roads, leading to delays and changes in traffic patterns. The Umatilla Tribe seeks clearer assurance that the road(s) to traditional fishing areas will remain open and accessible without excessive disruption or delay, for the health and safety of Tribal Fishers and for the free exercise of their reserved Treaty Rights.

Response: The EIS has been revised to remove the sentence that states through-traffic on John Day Dam Road used to access the tribal fishing site would not be limited. The final EIS acknowledges that increased traffic could cause delays and traffic pattern and that 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. The Commission cannot guarantee there would not be any delay in reaching the tribal fishing site.

Comment: The Yakama Nation, Interior, EPA, and the Environmental Groups state that the draft EIS does not appropriately discuss the resolution of adverse effects to historic properties, including but not limited to avoidance or minimization of effects and that these issues should be resolved and included in the final EIS. The Environmental Groups state that finalizing the Historic Properties Management Plan (HPMP) should occur in consultation with the Tribes prior to the issuance of any license for the project. American Rivers comments that the proposed HPMP is inadequate to mitigate adverse effects. Interior recommends that the final EIS include measures which provide “higher levels of protection for trust resources and should be analyzed in the final EIS. These include providing more details regarding the resolution of known adverse effects, along with the protocols for future consultation between the Applicant, the Tribes, and appropriate consulting parties to address potential effects to historic properties arising from the future operation and maintenance of the proposed Project, post-review discoveries, and modifications of the proposed Project that would be covered under the new license.” The Umatilla Tribes request consultation with the Commission on the status of the Section 106 process and states it expects to be involved in any discussions pertaining to mitigation and drafting the Programmatic Agreement (PA).

Response: While preferable to resolve all adverse effects prior to issuing a license, section 106 of the NHPA and its implementing regulations (36 C.F.R. 800.14(b)(ii)) permit the Commission to enter into a PA to resolve adverse effects “when effects on historic properties cannot be fully determined prior to approval of an undertaking” and “where other circumstances warrant a departure from the normal section 106 process.” As discussed above, the EIS describes the significance of the historic properties and the adverse effects on those resources and proposes measures to address those effects. Staff-recommended measures include marking areas National Register-eligible cultural sites and avoiding those areas to the extent possible; revising FFP’s draft HPMP to include research design and site-specific data recovery or other treatment plans for those sites that cannot be avoided; and developing 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. The execution and implementation of the Commission’s proposed PA would allow for continued consultation with the Washington SHPO, Tribes, and others after license issuance to finalize the HPMP and to develop additional measures that may be acceptable to the Tribes.

As noted above, we are seeking ways to further consult with affected Tribes within the limitations of our *ex parte* rules and met with the Umatilla Tribes on December 13, 2023. We will seek concurrence on the PA from all affected Tribes.

Comment: The Umatilla Tribes states that the HPMP falls short in its efforts to address the adverse effects and could do more to minimize potential impacts. The Umatilla Tribes recommends that the five archaeological sites affected by the undertaking be inventoried using specially trained canines for historic and prehistoric human remains detection because it would help prevent a later inadvertent discovery during the construction phase of the project. The

Umatilla Tribes states that a company like the Institute for Canine Forensics can provide these services and that this type of inventory can be completed in a short period of time.

Response: The final EIS recommends requiring the recommended surveys.

Comment: The Umatilla Tribes also recommended changes to the HPMP and draft PA. Changes to the HPMP include (1) periodic checks/monitoring to ensure the project activities are damaging historic properties; (2) procedures addressing newly discovered archaeological materials during construction; (3) methods and procedures for contacting the appropriate state officials in Washington and Oregon if human remains are found; and (4) measures to mitigate for the effects under criteria A and B, not just D. The Umatilla Tribes also suggests that off-site mitigation may be the preferred way to mitigate adverse effects to the TCPs and it should be in the form of a mitigation property with the First Foods resources available for harvest and gathering by members of the Umatilla Tribe.

Response: The final EIS recommends modifying the HPMP in consultation with the Washington and Oregon SHPO to refine the methods for monitoring cultural sites and handling newly discovered cultural resources. As explained in section 3.3.8, acquiring off-site mitigation lands for “First Food” gathering may be a reasonable mitigation measure; however, there is insufficient information to evaluate the efficacy of the measure, its benefits, costs or the acceptance to all the affected Tribes. For example, it is not known whether there are mitigation properties that could be purchased from willing sellers for tribal ownership that would contain resources appropriate for conducting cultural activities. We recommend that these measures be developed and the HPMP approved prior to any land-disturbing activities.

Comment: EPA recommends that the final EIS consider, and that the Commission consult with the National Park Service’s Departmental Consulting Archaeologist regarding, the applicability of the Archaeological and Historic Preservation Act (AHPA). EPA asserts that the AHPA requires federal agencies to preserve historic and archaeological objects and materials that would otherwise be lost or destroyed as a result of their projects or licensed activities or programs.

Response: The AHPA requires federal agencies to notify Interior if it finds that activities associated with any federal construction project or federally licensed project, activity, or program “may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archaeological data.” In those instances, the agency may request that Interior undertake the recovery, protection, and preservation of the data or may undertake those activities itself. Separately, section 106 of the NHPA requires that federal agencies take into account the effects of their actions on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. Here, the Commission’s responsibilities under section 106 are ongoing. Given that the Commission has yet to conclude its section 106 consultation process and continues to evaluate the effects of its action on historic properties, Commission staff believes that any finding under the AHPA regarding data recovery efforts would be premature.

Comment: EPA recommends that the analysis provided in the footnote on page 85 of the draft EIS be included as part of the text in the final EIS so that the cumulative impacts of nearby infrastructure to subsistence practices are clearly explained. EPA states “it would be more direct

to explain in the FEIS that while the current use of *Pushpum* may be unknown to FERC, it is known that significant access restrictions have been placed upon the Yakama Nation in this area. For example, since 1997, a nearby unrelated programmatic agreement intended to ‘allow members of the Yakama to conduct traditional plant gathering activities and other traditional uses’ in the area, but that such access was never granted.” EPA adds that “it would be useful for the FEIS to be informed through government-to-government consultation if the current subsistence practices reflect the historic or preferred subsistence practices of the Yakama Nation.”

James Oliver states that “the destruction of cultural resources and the loss of access to traditional lands could lead to the loss of cultural identity for the Confederated Tribes of the Umatilla Indian Reservation.” The Environmental Groups emphasize the importance of the area to the Tribes by including the following quote from the Yakama Tribe’s comments submitted on Washington DOE’s Draft Environmental Impact Statement on August 9, 2022: “These plant resources include buckwheats, balsam roots, lomatiums, yarrow, sumac, lupin, dogbane, rose, onion, thistle, serviceberry, sagebrush, junipers, and many others. These plants and combinations of them are used by Yakama People to treat illness in the body and spirit. These plants have served for thousands of years as poultice, tea, bandages, pacifiers, drums, needles, rope, nets, and food. They are important to traditional ceremonies and religious practices.”

Response: Footnote 59 pertains to a PA executed in 1997 between BPA, the Washington SHPO, the Advisory Council, and the Yakama Nation regarding 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.” The footnote is provided to explain the Yakama Nation’s recommendation and comments, not as an analysis of the project’s effect on subsistence or cultural resources; therefore, it remains a footnote in the final EIS. Section 3.3.8.3, *Cultural Resources, Cumulative Effects*, discusses the cumulative effects of infrastructure development on access to lands for traditional purposes, which could include subsistence activities. Therefore, we have no reason to revise the EIS. Regardless, because the project is located on private lands, access for subsistence activities likely has not been available for many years.

Comment: EPA comments that the draft EIS should consider visual impacts to Tribal populations visiting TCPs in the area. Friends of the White Salmon River state that “the natural landscape of the Columbia Hills area has been modified by the installation of John Day Lock and Dam, CGA Smelter, Klickitat County pumping station, nearby wind farms and other associated infrastructure. Together, these industrial projects have diminished the nature of the area for traditional Tribal use.” Referring to section 3.3.8.3, *Cultural Resources, Cumulative Effects*, Ms. Arnold states that “reading this it is impossible for us to understand how FERC can contemplate allowing additional damage, in the face of the description of the damage that has already been done.”

Response: Section 3.3.8.2, *Cultural Resources, Environmental Effects*, and section 3.3.7.2, *Aesthetic Resources, Environmental Effects*, already address the visual effect of constructing and

operating the project on Tribal populations visiting the TCPs. Therefore, no revisions to the final EIS are needed.

ENVIRONMENTAL JUSTICE

Comment: EPA states that it has concerns with the conclusion in the draft EIS that project impacts “would result in disproportionately high and adverse effects on environmental justice (EJ) communities . . . at a level that is less than significant with appropriate mitigation.” EPA states that the draft EIS “underrepresents communities with EJ concerns; only analyzes EJ concerns on a limited number of environmental resources (e.g., noise, air quality, and aesthetics); and does not analyze the interrelated cultural, social, historical or other factors that may amplify the effect of the proposed action on communities with EJ concerns, e.g., the physical sensitivity of the community or population to particular impacts, the effect of any disruption on the community structure associated with the proposed action, and the nature and degree of the impact on the physical and social structure of the community.” To address these concerns, EPA recommends: (1) the Commission conduct targeted outreach and provide meaningful involvement opportunities for communities with EJ concerns, including Tribal and indigenous populations, who may visit or have cultural ties to the proposed project and include in the final EIS a summary of the meaningful engagement with Tribal and other communities with EJ concerns and how that engagement informed project decision-making, modifications, mitigation measures, or availability of alternatives; (2) the EJ analysis in the final EIS identify communities with EJ concerns, including Tribal and indigenous populations, residing outside the 5-mile radius who may visit the project area for traditional subsistence activities and cultural purposes and identify whether any of these communities with EJ concerns living outside the 5-mile radius include low-income populations; (3) the final EIS include an EJ analysis of direct, indirect, and cumulative cultural resources impacts, including disproportionate impacts, on Tribal and indigenous populations from within the 5-mile buffer and those visiting the project area from further away (i.e., transient populations); and (4) the final EIS include the identification, inclusion, and integration of Traditional Ecological Knowledge into the NEPA analysis.

Interior states that the record does not demonstrate that opportunities for public involvement were targeted at engaging environmental justice communities and “request that the Commission through the issuance of the final EIS create additional avenues targeted at these environmental justice communities.”

Response: Section 3.3.10.1, *Meaningful Measures and Public Involvement*, describes the opportunities given for public and Tribal involvement during the development and processing of the license application. As discussed previously, Commission staff invited the Yakama Nation, Umatilla Tribes, Warm Springs Tribes, and Nez Perce to participate in the licensing process, offered to meet with them and have met with members of the Yakama Nation, Nez Perce Tribe, and the Umatilla Tribe. A detailed consultation record with the Tribes is provided in section 1.4, *Tribal Consultation*. Commission staff are exploring additional opportunities for Tribal engagement that is consistent with the Commission’s *ex parte* rules. Absent any further discussion with the Tribes, the ethnographic studies completed by and in consultation with the Tribes provides a clear understanding of the importance of the project area to Tribal members.

Commission staff followed CEQ's and EPA's guidance for identifying EJ communities. The EJ analysis in the final EIS has been revised based on the most current American Community Survey 5-Year Estimates (2017-2021). The more current data indicates that there are four EJ communities within a 5-mile radius of the project. Of these four identified EJ communities, two meet the criteria for "minority population" and only one of these two communities are reported to contain American Indian populations (0.3%) (Census Tract 9501, Block Group 2 in Sherman County). A 5-mile radius around the project boundary was chosen for analysis because this is the extent of the construction and operation effects on noise, air quality, and visual resources that users of the project area would experience. While Tribal members from outside the analysis area may want to use the lands affected by project construction and operation, it is unclear whether they can do so because the lands are privately held. Regardless, the effects described in the EIS would be the same as those experienced by those residing within the 5-mile radius. Therefore, expanding the EJ analysis beyond the 5-mile radius to identify additional EJ communities and determine if they include low-income populations is not necessary.

Nonetheless, in accordance with EPA's *Promising Practices*, we recognize that the project's effects on TCPs and ceremonies represent a unique cultural vulnerability. Therefore, we have revised the EJ analysis in the final EIS to address direct, indirect, and cumulative effects on Tribal use of the project area.

Section 3.3.8, *Cultural Resources*, describes TCPs and historic use of the project area, including food gathering and ceremonial and spiritual practices, by the Yakama Nation, Umatilla Tribes, and Nez Perce based on ethnographic studies completed by or in consultation with the respective Tribes. Thus, the EIS already considers Traditional Ecological Knowledge.

Comment: EPA comments that while the draft EIS states that the project will benefit the State of Washington's energy goals, the adverse effects fall disproportionately on Tribal and Indigenous populations and that efforts to determine appropriate measures for addressing these disproportionate impacts are needed. The Environmental Groups state that the draft EIS fails to address the EJ impacts to Tribal communities, does not address the cumulative impacts of green energy development on Tribes, and ignores the detrimental impacts to Tribes.

Response: As discussed above, the EJ analysis has been revised to reflect the most current populations statistics and to address to address direct, indirect, and cumulative effects on Tribal use of the project area. The execution and implementation of the Commission's proposed PA would allow for continued consultation with the Washington SHPO and Tribes after license issuance to finalize the HPMP and to collaboratively develop mitigation measures that may be acceptable to the Tribes.

AIR QUALITY/GREENHOUSE GAS/NOISE

Comment: American Rivers states that the analysis in section 3.3.11.2, *Air Quality and Climate Change, Environmental Effects*, "fails to provide an analysis of anticipated [greenhouse gases (GHG)] to be emitted from project reservoirs over the lifecycle of the Project. Dams and reservoirs integral to hydropower production create and emit GHGs by altering the carbon balance of riverine ecosystems and adjoining lands, generally resulting in net emissions of

carbon dioxide and methane.” American Rivers requests that the Commission “assess the project’s net GHG emissions using the GHG Reservoir Tool (G-res Tool), a publicly available, web-based modeling tool used by researchers and hydropower companies to estimate and report GHG emissions from reservoirs” which it states can be found at <https://gres.hydropower.org/>. Additionally, American Rivers recommends that the results of the modeling should be validated by submitting model inputs to the G-res organization to ensure that the tool was used properly.

Response: The construction of new reservoirs on rivers results in the inundation of large quantities of organic matter. The subsequent aerobic and anaerobic decomposition of flooded organic matter results in the emission of GHGs. However, here, the project is not located on riverine system, construction would clear all vegetation from the reservoir sites, and the reservoirs would be lined with concrete and geosynthetic membrane liner. Because the project would be a closed-loop facility, future input of organic matter would be minimal. Therefore, the organic matter necessary for the creation of GHGs would be negligible. Thus, we do not expect any production of GHGs from the project reservoirs and there is no need further assess GHG production from the reservoirs using the G-res tool.

Comment: EPA comments that the final EIS should discuss GHG emissions and climate change similar to that found in Washington DOE’s analysis or summarize or incorporate by reference sections of Washington DOE’s analysis which included “assessments on air temperature; precipitation, snowpack, streamflow, and groundwater; water temperature, and wildfire occurrence and intensity; effects of climate change on the proposed project; and potential effects of climate change by resource, including environmental justice.”

Response: Section 3.3.11, *Air Quality and Climate Change*, describes climate trends for the Pacific Northwest Region. Washington DOE’s Final EIS summarizes climate trends in the Columbia River Basin. We revised the final EIS to incorporate that regional information. However, we do not incorporate Washington DOE’s analysis of project effects on climate change because we could not identify discrete physical impacts resulting from the project’s GHG emissions on the resources identified by EPA. Without the ability to determine discrete resource impacts, we are unable to assess the project’s individual contribution to climate change through any objective analysis of effects attributable to the project. Summarizing or incorporating Washington DOE’s analysis of general effects of future climate change on resources would not improve our ability to identify discrete project impacts or inform license conditions.

Comment: EPA recommends that project-related emissions be made available in tables and text in the final EIS.

Response: Project-related emissions are quantified and presented in the text in section 3.3.11.2, *Air Quality and Climate Change, Environmental Effects*, and included in table 3.3.11-3 in Appendix B. Therefore, no changes to the final EIS are needed.

Comment: EPA recommends that the final EIS include a summary of how the changing climate may affect the project’s infrastructure or the life of its operations, such as “the potential impact of increasing temperatures on the amount of water lost from the reservoirs due to evaporation” and “the potential impact of regional climate trends on the changes of water availability in the region to fill the reservoirs.”

Response: Regarding increasing temperatures on water availability, the project is estimated to need 360 acre-feet of make-up water each year to refill the reservoirs, with the greatest evaporation occurring during the summer months. Trends showing an increase in average annual temperatures could increase evaporation rates during the summer; however, FFP's estimate of make-up water demand assumes a future evaporation rate greater than measured in the historical record to account for this anticipated future with climate change. Therefore, increasing temperatures and evaporation rates should not affect project operation. Although climate trends suggest decreases in Columbia River flows because of climate change, the project would not create a new appropriation of water from the Columbia River because make-up would be provided by Klickitat PUD via its existing water right; however, the project's withdrawals, albeit small relative to the flow in the Columbia River, could contribute to increased regional competition for water. The small quantities of make-up water needed for operation should not affect the project's ability to operate. Should environmental conditions change in the future because of climate change, the Commission's regulations and the requirements of any license would include measures that would ensure the project continues to maintain its structural integrity and safe operating conditions over the term of the license. Additionally, if there is a need to modify project operation or facilities to accommodate changes because of climate change or related factors during the term of any license issued, and reliable data became available to justify such modifications, the Commission's standard reopener article gives the Commission the ability to respond to the impacts of climate change, should license conditions need to be altered to respond to unforeseen environmental impacts.

Comment: EPA states: "In our review of the project's DEIS and [State Environmental Policy Act (SEPA)] documents, we note that both FERC and Ecology analyze construction emissions and operations emissions. In both documents, the construction emissions estimates are the same. However, the operations emissions diverge significantly. The operations emissions in the DEIS are about 96,000 tons of CO₂e per year, while the SEPA document estimates about 1,780 tons of CO₂e per year. The SEPA Appendix D clarifies that the analysis does not include emissions estimates for most generation operations because the power will not be derived from 'emitting sources.' We agree with FERC that it is worthwhile to estimate the potential emissions from generation activities. However, since the Bonneville Power Administration will be administering the project, it may be more accurate to analyze the electricity generated and available within BPA's district rather than a statewide comparison to understand the estimated emissions associated with consumed electricity."

Response: In the draft EIS, Commission staff assumed that a proportion of the energy used to pump water to the upper basin would come from fossil fuel generation sources based on the resource mix available in the state of Washington. However, we believe that assumption was wrong because FFP proposes to use surplus energy from renewable sources to pump water to the upper reservoir; therefore, it reasonable to assume, as Washington DOE did, that the power used to pump water will not be derived from emitting sources. Consequently, there would be no emissions during operation except for the occasional use of trucks and other maintenance equipment that burns fossil fuels. We revised the final EIS accordingly.

The Commission will oversee any license that is issued for the project. A map of BPA's service area (available online at <https://www.bpa.gov/-/media/Aep/about/publications/maps/bpa-servicearea.pdf>) shows that BPA's territory includes the states of Idaho, Oregon, and

Washington, and extends into smaller portions of Montana, California, Nevada, Utah, and Wyoming. Section 3.3.11.2, *Air Quality and Climate Change, Environmental Effects*, compares the project's GHG emissions to both national and State of Washington GHG emission inventories as has been done in other NEPA analyses prepared by Commission staff. We believe this provides sufficient context for the project's anticipated emissions and thus see no reason to evaluate emissions in the context of BPA's service area.

Comment: EPA recommends that the estimate of construction emissions in the EIS include an estimate of the "embodied emissions due to construction materials." EPA states that "embodied emissions are the quantity of emissions, accounting for all stages of production including upstream processing and extraction of fuels and feedstocks, emitted to the atmosphere due to the production of a product per unit of such product." EPA further states that the federal government has a "Buy Clean policy" to promote use of construction materials with lower embodied emissions, taking into account the "life-cycle emissions associated with the production of those materials" and recommends the project consider use of construction materials with lower embodied emissions.

Response: If licensed, materials would be purchased and the project would be constructed by the non-federal licensee, not the Commission. However, the licensee would need to ensure that the materials selected are consistent with the Commission's dam safety requirements and that the project is constructed in accordance with the license's design requirements.

Comment: EPA states that the final EIS should describe in more detail the extent of planned mitigation measures to be integrated into the fugitive dust control plan. EPA states that a "robust fugitive dust control plan would include measures such as:

- A robust surface/roadway watering plan, possibly including chemical dust control and/or gravel roadway cover if necessary.
- A robust monitoring and response plan to identify and address periods of significant dust emission.
- Consideration of weather conditions including a threshold high windspeed for halt of material movement and processing to prevent significant dust emission events.
- Roadway speed limits to limit dust entrainment.
- Haul truck cleaning and load covering requirements.
- Identification of responsible officials and training procedures.
- Record keeping and reporting schedules.
- Community/citizen reporting forms/phone-line and contact information to report dust impact events."

Response: As discussed in sections 3.3.1.2, *Geology and Soils, Environmental Effects*, and 3.3.11.2, *Air Quality and Climate Change, Environmental Effects*, FFP proposes to develop a soil erosion and sediment control plan that includes best management practices for controlling wind and water erosion on project land. The plan would describe, in more detail, the extent of planned mitigation measures to control fugitive dust such as applying dust palliatives to limit air borne particles. Erosion control plans are usually developed during the final project design based on site-specific conditions and reviewed by the Commission's Division of Dam Safety

before any construction is authorized to begin. However, to make the plan more robust, we now recommend in section 5.1, *Comprehensive Development and Recommended Alternative*, and in Appendix G that the dust control measures in the erosion control plan include the detail recommended by EPA.

Comment: EPA states that the final EIS should disclose what construction permits would be required for the two concrete batch plants and summarize the control, monitoring, and reporting requirements that may be required under the permits and how these permit requirements would help protect the ambient air quality standards and limit impacts.

Response: As discussed previously, Appendix C describes the status of those statutory and federal regulatory requirements needed for the Commission to reach a licensing decision (e.g., FPA, Clean Water Act, ESA, NHPA, etc.). Defining all the necessary construction permits and their requirements is beyond the scope of the EIS. Regardless, if a license is issued, the licensee would be required to obtain all necessary permits and authorizations to commence construction within two years of any license issued. The conditions of those permits would dictate control, monitoring, and reporting requirements.

Comment: EPA disagrees with the following statement in section 3.3.11.2, *Air Quality and Climate Change, Environmental 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 [Prevention of Significant Deterioration (PSD)]/Title V programs. Therefore, construction phase criteria pollutant impacts would not result in significant air quality impacts.” EPA states that it unreasonable to conclude no significant air quality impacts simply because the emissions are not high enough to trigger PSD or Title V permitting requirements and requests the concluding statement be deleted from the EIS.

Response: Section 3.3.11, *Air Quality and Climate Change*, states that “While EPA’s [PSD] 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” (emphasis added). The analysis is intended to provide *a relative comparison to levels* that are recognized to have sufficient adverse effects to trigger PSD and Title V permitting requirements. Nonetheless, we clarified the text in section 3.3.11.2 to read as follows: “This suggests that construction phase criteria pollutant impacts would not likely result in significant air quality impacts.”

Comment: The Environmental Groups comment that the project would not meet its stated goal of meeting the states’ carbon reduction and environmental policy goals and would instead increase GHG emissions. The Environmental Groups state that the EIS: (1) fails NEPA’s “hard look” standard in its emission comparisons; (2) does not take a “hard look” at reasonably foreseeable climate impacts; (3) refuses to determine the significance of the project’s GHG emissions or the incremental nature of climate change; (4) does not consider the project’s promotion of fossil fuel energy; and (5) fails to consider a renewables-powered alternative.

Response: Section 3.3.11.2, *Air Quality and Climate Change, Environmental Effects*, estimates GHG emissions and compares the projected emissions during project construction to national and Washington State inventories. As explained previously, we revised the EIS to include more information on climate trends specific to the Columbia River Basin. However, we do not try to quantify the project effects on climate change and resources because we could not identify discrete physical impacts resulting from the project's GHG emissions on the discrete environmental resources. The project does not promote fossil fuel production as suggested by the Environmental Groups. It does the opposite by providing needed power when renewables such as wind and solar are not available. We revised the final EIS to indicate that because power for pumping would use surplus renewable power, it would not contribute to GHG production and further reduces reliance on fossil fuels.

Comment: James Oliver states that “the project could have a negative impact on air quality in the area. The construction and operation of the project could generate emissions of air pollutants, such as nitrogen oxides, sulfur dioxide, and particulate matter. These pollutants could contribute to respiratory problems, heart disease, and cancer.”

Response: Section 3.3.11.1, *Air Quality and Climate Change, Affected Environment*, acknowledges that criteria air pollutants can have adverse effects on public health, which is why EPA established National Ambient Air Quality Standards. The analysis in section 3.3.11.2, *Air Quality and Climate Change, Environmental Effects*, describes the project's emission levels relative to those standards.

Comment: EPA recommends the Final EIS reference and apply the CEQ NEPA Guidance on Consideration of GHGs and Climate Change to determine the potential climate-related impacts of the project. EPA adds that “The updated guidance . . . improves transparency in the reporting of greenhouse gas emissions, including the appropriate use of the social cost of greenhouse gases to disclose climate impacts, provides specific recommendations for renewable and low greenhouse gas projects to keep reviews focused, and makes projects more climate-smart and resilient while helping reach [our national] goal to achieve net-zero emissions by 2050.”

The Environmental Groups state that the Commission at a minimum should “quantify GHG emissions across alternatives; disclose the impact of those GHG emissions on the public via the use of the Interagency Working Group's (IWG) social cost of carbon dioxide and social cost of methane estimates; and assess whether continued and expanded fossil fuel production and the associated GHG emissions are consistent with our national goal of reducing GHG emissions by 50-52% by 2030 and to net zero by 2050.”

The Environmental Groups go on to request that the Commission “consider, discuss, and evaluate the climate science regarding past and present impacts from climate change to further contextualize the climate impacts from the cumulative emissions of GHGs associated with the proposed project.” The Environmental Groups suggest that the Commission consider using the following tools: (a) EPA's greenhouse gas equivalency calculator which can be used to express the estimated annual GHG emissions from the project in terms of the GHG emissions produced from gas-fueled vehicles driven for one year, or the emissions that could be avoided by operating wind turbines as an alternative energy source or offset by the carbon sequestration of forest land; (b) the social cost of greenhouse gases (SC-GHG) tool which can provide an estimate of the

monetized global damages associated with the incremental increases of GHGs; or the “MAGICC model” which can be used to evaluate the impact of GHG emissions associated with the proposed project on the remaining atmospheric capacity to take on further GHG emissions without exceeding different degrees of additional warming. For SC-GHG tool, the Environmental Groups urge the Commission to apply the Social Cost of Greenhouse Gas values contained in EPA’s September 2022 Report on the *Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances*, which they contend is a more accurate and up-to-date estimate of the costs of greenhouse gas production and consumption than the 2021 Interim Estimates of the Social Cost of Carbon, Methane, and Nitrous Oxide produced by the Interagency Working Group.

Response: As stated in the EIS, to date, Commission staff have not identified a methodology to attribute discrete, quantifiable, physical effects on the environment resulting from the project’s incremental contribution to GHGs. Additionally, Commission staff have not been able to find an established threshold for determining the project’s significance when compared to established GHG reduction targets at the state or federal level. Therefore, this EIS does not characterize the project’s GHG emissions as significant or insignificant.²⁵ However, to address EPA’s and the Environmental Group’s comment and to provide additional context, we revised section 3.3.11.2, *Air Quality and Climate Change, Environmental Effects*, to include an estimate of the social cost of GHGs associated with the reasonably foreseeable GHG emissions during construction. However, calculating the social cost of GHGs does not enable the Commission to determine credibly whether the reasonably foreseeable GHG emissions associated with a project are significant or not significant in terms of their impact on global climate change.²⁶ In addition, there are no criteria to identify which monetized values are significant for NEPA purposes, and we are currently unable to identify any such appropriate criteria.²⁷ Because both the EPA and

²⁵ See, e.g., *Driftwood Pipeline LLC*, 183 FERC ¶ 61,049, at P 63 (2023) (“[T]here currently are no accepted tools or methods for the Commission to use to determine significance, therefore the Commission is not herein characterizing these emissions as significant or insignificant.”)

²⁶ See *Mountain Valley Pipeline, LLC*, 161 FERC ¶ 61,043, at P 296 (2017), *aff’d sub nom.*, *Appalachian Voices v. FERC*, No. 17-1271, 2019 WL 847199 (D.C. Cir. 2019) (unpublished); *Del. Riverkeeper Network v. FERC*, 45 F.th 104, 111 (D.C. Cir. 2022). The social cost of GHGs tool merely converts GHG emissions estimates into a range of dollar-denominated figures; it does not, in itself, provide a mechanism or standard for judging “significance.”

²⁷ *Tenn. Gas Pipeline Co., L.L.C.*, 181 FERC ¶ 61,051, at P 37 (2022); see also *Mountain Valley Pipeline, LLC*, 161 FERC ¶ 61,043 at P 296, *order on reh’g*, 163 FERC ¶ 61,197, at PP 275-297 (2018), *aff’d*, *Appalachian Voices*, No. 17-1271, 2019 WL 847199 at 2 (“[The Commission] gave several reasons why it believed petitioners’ preferred metric, the Social Cost of Carbon tool, is not an appropriate measure of project-level climate change impacts and their significance under NEPA or the Natural Gas Act. That is all that is required for NEPA purposes.”); *EarthReports*, 828 F.3d 949, 956 (D.C. Cir. 2016) (accepting the Commission’s explanation why the social cost of carbon tool would not be appropriate or informative for project-specific review, including because “there are no established criteria identifying the monetized values that are to be considered significant for NEPA purposes”); *Tenn. Gas Pipeline*

CEQ participate in the IWG, Commission staff used the methods and values contained in the IWG's current draft guidance but note that different values will result from the use of other methods.²⁸

Comment: The Environmental Groups state that the Commission improperly frames and weighs the context and intensity factors for assessing the significance of reasonably foreseeable GHG emissions from the proposed project and its cumulative climate impacts. The Environmental Groups state that a comparison to estimated GHG emissions to national and state GHG emission inventories suggests that the GHG emissions from the proposed project are minimal in their view “precisely how the 2016 CEQ GHG Guidance and 2023 Interim CEQ Guidance directed federal agencies not to limit assessments of the significance of GHG emissions.” The Environmental Groups request that the Commission include a “more comprehensive comparison of the estimated GHG emissions associated with the proposed project to other emissions sources, including but not limited to fossil fuel leases, individual coal-fired and natural gas electric generating facilities, and individual concentrated animal feeding operations (CAFOs).”

Response: The National Renewable Energy Laboratory (NREL) published a fact sheet that provides estimates of GHG emissions based on a review of approximately 3,000 published life-cycle assessment studies on utility-scale electricity generation from wind, solar photovoltaics, concentrating solar power, biopower, geothermal, ocean energy, hydropower, nuclear, natural gas, and coal technologies, as well as Li-ion battery, pumped storage hydropower, and hydrogen storage technologies.²⁹ NREL reports that hydropower pumped storage produces a median value of 7.4 g CO₂e/kWh over the life of the plant. Li-ion battery and hydrogen fuel cells produced median values of 33 and 38 g CO₂e/kWh, respectively. Photovoltaic, solar, and wind produce median values of 43, 28, and 13 g CO₂e/kWh, respectively. Most of the emissions for these renewables are from construction and decommissioning of the plants. Ongoing non-combustion median values reported for hydropower pumped storage plants were 1.8 g CO₂e/kWh, hydrogen fuel cell was 2.5 g CO₂e/kWh, and Li-ion batteries had no report values in the literature. Median values for ongoing non-combustion for photovoltaic, solar, and wind were 10, 10, and 0.74 g CO₂e/kWh, respectively. In contrast, natural gas and coal technologies had reported total median life-cycle emissions of 486 and 1001 g CO₂e/kWh, respectively, with ongoing combustion rates of 389 and 1010 g CO₂e/kWh.

However, we have not included this information in the final EIS because we do not see how these comparisons help quantify physical effects on the environment resulting from the

Co., L.L.C., 180 FERC ¶ 61,205, at P 75 (2022); *see, e.g., LA Storage, LLC*, 182 FERC ¶ 61,026, at P 14 (2023); *Columbia Gulf Transmission, LLC*, 180 FERC ¶ 61,206, at P 91 (2022).

²⁸ Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990*, at 5 (Table ES-1) (Feb. 2021).

²⁹ *See* NREL, *Life Cycle Greenhouse Gas Emissions from Electricity Generation: Update*, <https://www.nrel.gov/docs/fy21osti/80580.pdf> (accessed October 30, 2023).

project's incremental contribution to GHGs or inform the licensing decision or what conditions to include in any license issued for the project.

Comment: The Environmental Groups state the following: "A speculative increase in renewable energy in the grid does not obviate the need for a hard look at the project's impact on the grid as it exists today. If the shift in power sources fueling the grid is not speculative, due to state policy, FERC must be more specific in analyzing the timeline of the expected phase-out of coal and natural gas-powered electricity. Overall, FERC must take a hard look at the reasonably foreseeable impacts this project will have on fossil fueled electricity generation."

Response: As discussed previously, we revised the analysis to indicate that project operation is unlikely to generate any GHGs. Thus, the analysis is not dependent on the expected phase-out of coal and natural gas-powered electricity but would assist in achieving those goals.

DEVELOPMENTAL ANALYSIS

Comment: American Rivers states that it has concerns regarding the economic viability of the project. Specifically, American Rivers notes the following conclusions from a commissioned Rocky Mountain Econometrics critique report prepared for the project: (1) the project is very unlikely to operate profitably; (2) the project will not be able to serve in its stated capacity for a large portion of each day; and (3) the project will have no control over the prices of the energy it buys and sells. Therefore, it is not clear that the benefits provided by the project will outweigh its adverse impacts. American Rivers requests that Commission staff review the Rocky Mountain Econometrics report provided as Appendix A to its comment letter.

Response: Commission staff reviewed the report and offers the following responses to each of American Rivers' points:

Regarding item #1, as explained in section 4.0, *Developmental Analysis*, the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,³⁰ is to compare 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). 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. It is not intended to determine whether the project would be profitable to operate as conditioned in the license. That decision is left to the licensee because there are many factors that a licensee might consider in deciding whether it makes financial sense to develop a project. Furthermore, while the analysis helps support an informed decision concerning what is in the public interest, project economics is only one of many public

³⁰ 72 FERC ¶ 61,027 (1995).

interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

Regarding item #2, this is characteristic of pumped storage systems: water is pumped to the upper reservoir during low demand periods and used to generate during higher-demand periods. As such, FFP states that the project would typically generate 8 hours per day and pump/refill during the remaining 16 hours of the cycle.

Regarding item #3, this is typical of any wholesale market such as the one in which the project would operate. This makes low demand energy less expensive and high-demand energy more expensive, which is the basis for the feasibility of a pumped storage project.

COMPREHENSIVE PLANS

Comment: EPA recommends that Commission staff consider and summarize “relevant state, tribal, or local adaptation plans.”

Response: Section 10(a)(2)(A) of the FPA,³¹ requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.³² As stated in section 5.4, *Consistency with Comprehensive Plans*, Commission staff reviewed comprehensive plans applicable to the Goldendale Project (Appendix I). After the draft EIS was issued, staff identified two comprehensive plans pertaining to the Lewis and Clark National Historic Trail that were not considered in the draft EIS. In the final EIS, we have added these two plans to the list in Appendix I and reviewed them. No inconsistencies were found. We are not aware of any other federal or state comprehensive plans that would apply to the Goldendale Project area.

³¹ 16 U.S.C. § 803(a)(2)(A).

³² Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2022).

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**APPENDIX M – WASHINGTON DEPARTMENT OF ECOLOGY WATER QUALITY
CERTIFICATION CONDITIONS (ISSUED MAY 22, 2023)**

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Water Quality Certification Conditions

The following conditions will be incorporated into the FERC license and the Corps permit and strictly adhered to by the Free Flow Power Project 101, LLC (c/o Rye Development).

Specific condition justifications and citations are provided below each condition.

A. GENERAL CONDITIONS

1. In this WQC Order, the term “Project Proponent” shall mean the Free Flow Power Project 101, LLC (c/o Rye Development) and its agents, assignees, and contractors.
 - Justification - Ecology needs to identify that conditions of this WQC Order apply to anyone conducting work on behalf of the Project Proponent to ensure compliance with the water quality standards and other applicable state laws.
 - Citation - 40 CFR 121.1(j), Chapter 90.48 RCW, RCW 90.48.080, RCW 90.48.120, RCW 90.48.260, Chapter 173-200 WAC, Chapter 173-201A WAC, and WAC 173-225-010.
2. All submittals required by this WQC Order shall be sent to Ecology’s Headquarters Office, Attn: Federal Permit Manager, via e-mail to fednotification@ecy.wa.gov and cc to lore.randall@ecy.wa.gov. The submittals shall be identified with WQC Order No. 21703 and include the Project Proponent’s name, FERC license number, Corps permit number, project name, project contact, and the contact phone number.
 - Justification - Ecology needs to identify where information and submittals are to be submitted to be in compliance with the requirements of this WQC Order.
 - Citation - Chapter 90.48 RCW, RCW 90.48.120, RCW 90.48.260, Chapter 173-201A WAC, and WAC 173-225-010.
3. Work authorized by this WQC Order is limited to the work described in the WQC request package received by Ecology on 5/23/2022, and the supporting documentation identified in Table 1.
 - Justification - Ecology has the authority to prevent and control pollution of state waters. By authorizing a discharge into a water of the state, through a WQC, Ecology is certifying the project as proposed will not negatively impact water quality. Therefore, it is imperative the project is conducted as it was presented during the review process. Any deviations from information within the WQC Request package and this WQC Order must be disclosed prior to the initiation of the planned work and may require a new WQC request.
 - Citation - 40 CFR 121.5, 40 CFR 121.10, 40 CFR 121.11, Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.120, RCW 90.48.260, Chapter 173-200 WAC, Chapter 173-201A WAC, Chapter 173-204 WAC, and WAC 173-225-010.

4. The Project Proponent shall provide Ecology documentation for review before undertaking any major changes to the proposed project that could significantly and adversely affect water quality, other than those project changes required by this WQC Order.
 - Justification - Ecology has independent authority to enforce our 401 certification conditions issued through this WQC Order pursuant to RCW 90.48, and has independent state authority to ensure protection of state water quality. To ensure the project will comply with water quality standards in the event of any major changes, Ecology must be able to review the scope of work involved in the construction and operation of the project, otherwise all work must stop and a new 401 certification pre-filing meeting, followed by a new WQC request (after requisite 30-days) is required.
 - Citation - 40 CFR 121.1(k) and (n), 40 CFR 121.3, 40 CFR 121.5, 40 CFR 121.11, Chapter 90.48 RCW, and Chapter 173-201 WAC.
5. The Project Proponent shall keep copies of this WQC Order on the job site and readily available for reference by Ecology personnel, the construction superintendent, construction managers and lead workers, and state and local government inspectors.
 - Justification - All parties (including on-site contractors) must be aware of and comply with the WQC Order for the protection of water quality.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-201A WAC, and WAC 173-225- 010.
6. The Project Proponent shall hire third party personnel, with a Certified Erosion and Sediment Control Lead (CESL) certification, to:
 - a. Conduct site inspections and monitoring during construction.
 - b. Provide notification required by this WQC Order and other water quality permits.
 - c. Ensure that all plans and reports are submitted to Ecology as required by this WQC Order and other water quality permits.
 - d. Submit (per A.2.) monthly written project status reports of the construction activities and changes that occurred on site. The frequency of these reports may be adjusted as the project evolves.
 - Justification - Ecology must have a third party person on site that has the authority to oversee the project to prevent and control pollution of state waters. Requiring a third party will allow for a neutral party to oversee the work and reports back to Ecology thus ensuring work is conducted in a manner that meets this WQC Order and water quality requirements.
 - Citation - 40 CFR 121.5, 40 CFR 121.10, 40 CFR 121.11, Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.120, RCW 90.48.260, Chapter 173-200 WAC, Chapter 173-201A WAC, Chapter 173-204 WAC, and WAC 173-225-010.

7. The Project Proponent shall provide access to the project site upon request by Ecology personnel for site inspections, monitoring, and/or necessary data collection, to ensure that conditions of this WQC Order are being met.
 - Justification - Ecology must be able to investigate and inspect construction sites and facilities for compliance with all state rules and laws.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.090, RCW 90.48.120, Chapter 173-201A WAC, and WAC 173-225-010.
8. The Project Proponent shall ensure that all project engineers, contractors, and other workers at the project site with authority to direct work have read and understand relevant conditions of this WQC Order and all permits, approvals, and documents referenced in this WQC Order. The Project Proponent shall provide Ecology a signed statement (see Attachment A for an example) before construction begins.
 - Justification - Ecology needs to ensure that anyone conducting work at the project, on behalf of the Project Proponent, are aware of and understand the required conditions of this WQC Order to ensure compliance with the water quality standards and other applicable state laws.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-201A WAC, and WAC 173-225-010.
9. This WQC Order does not authorize direct, indirect, permanent, or temporary impacts to waters of the state or related aquatic resources, except as specifically provided for in conditions of this WQC Order.
 - Justification - Ecology has the authority to prevent and control pollution of state waters, and to protect designated uses. By authorizing a discharge into a water of the state, through a water quality certification, Ecology is certifying the project as proposed will not negatively impact state water quality and will comply with the state's water quality requirements. Therefore, it is imperative the project is conducted as it was presented during the review process, and as conditioned herein.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.120, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300(2)(e)(i), WAC 173-201A-310, WAC 173-204-120, and WAC 173-225-010.
10. Failure of any person or entity to comply with the WQC Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the state's water quality standards and the conditions of this WQC Order.
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses. Ecology has independent state authority to ensure protection of state water quality. Civil penalties and other enforcement actions are the primary

means of securing compliance with water quality requirements.

- Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.037, RCW 90.48.080, RCW 90.48.120, RCW 90.48.140, RCW 90.48.142, RCW 90.48.144, and WAC 173-225-010.

11. The Project Proponent shall send (per A.2.) a copy of the final Federal license and permit to Ecology's Federal Permit Manager within two weeks of receiving it.

- Justification - This condition is needed to ensure that all the conditions of the WQC Order have been incorporated into the federal permit.
- Citation - 40 CFR 121.10, 40 CFR 121.11, and Chapter 90.48 RCW.

12. This WQC Order will automatically transfer to a new owner or operator if:

- a. A Request for Transfer of Order form is completed between the Project Proponent and new owner or operator with the specific transfer date of the WQC Order's obligations, coverage, and liability and submitted to Ecology per condition A.2. Link to form: <https://apps.ecology.wa.gov/publications/SummaryPages/ECY070695.html>;
 - b. A copy of this WQC Order is provided to the new owner or operator.
 - c. Ecology does not notify the new Project Proponent that a new WQC Order is required to complete the transfer.
- Justification - Ecology has independent state authority to ensure protection of state water quality. Ecology needs to ensure that anyone conducting work at the project, including any new owners or operators, are aware of and understand the required conditions of this WQC Order to ensure compliance with the water quality standards and other applicable state laws.
 - Citation - 40 CFR 121.5, Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-201A WAC, and WAC 173-225-010.

B. PERMITS OR AUTHORIZATIONS

1. This Certification does not authorize any discharge of waters that cause or tend to cause pollution, as determined by Ecology, to waters of the state, including the Swale Creek drainage and discharges to groundwater. All applicable water quality permits required under the Water Pollution Control Act (RCW 90.48), or the federal Clean Water Act, must be obtained by the project proponent prior to discharge.

- a. The project proponent must submit a complete application to Ecology for a National Pollutant Discharge Elimination System (NPDES) discharge permit, per WAC 173-220, at least 180 days prior to any discharge of wastewater to the Swale Creek Drainage.

- b. If proposing to discharge wastewater to ground, the proponent must submit a complete application to Ecology for a State Waste Discharge permit, per WAC 173-216, at least 60 days prior to discharging to ground.
 - c. The Project Proponent must provide all known, available, and reasonable methods of prevention, control, and treatment to any discharge of waters from the reservoir, per WAC 173-216, and as approved by Ecology prior to discharge, irrespective of any additional requirements to obtain applicable water quality permits.
 - Justification - Ecology must protect waters of the state and prevent potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, RCW 90.48.260, Chapter 173-200 WAC, WAC 173-200-040, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, Chapter 173-216 WAC, Chapter 173-220 WAC, and WAC 173-225-010.
 2. The Project Proponent shall obtain and comply with the conditions of the following permits for this project:
 - a. Construction Stormwater General Permit and a Companion Order to address known contamination in the vicinity of the lower reservoir.
 - b. Sand and Gravel General Permit, unless a portable concrete batch plant with a current permit will be used.
 - Justification - Ecology requires general permits to limit the discharge of pollutants to surface waters and limits the discharge of pollutants to surface and ground water. Ecology must prevent potential discharges of pollution that can affect water quality and protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, RCW 90.48.260, Chapter 173-200 WAC, WAC 173-200-040, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-220, and WAC 173-225-010.
 3. The Project Proponent shall obtain and comply with a Surface Reservoir Permit for this project prior to filling the reservoirs.
 - Justification - Ecology must promote and protect the interests of the public waters of the state and preserve its natural resources and aesthetic values. A reservoir permit will be required whenever it is proposed to construct a barrier across a stream, channel, or water course, and which will actually retain for a beneficial use a portion of the annual runoff of the stream or water course. This will also apply to a reservoir adjacent to a stream channel when water will be required to fill the reservoir in addition to constant diversion to keep it full.
 - Citation - Chapter 90.03 RCW, RCW 90.03.005, Chapter 90.48 RCW, RCW

90.48.030, RCW 90.48.080, RCW 90.48.260, Chapter 90.54 RCW, Chapter 173-201A WAC, WAC 173-201A-300-330, WAC 173-204-120, WAC 173-225-010, Chapter 508-12 WAC, and WAC 508-12-260.

4. The Project Proponent shall implement an Ecology approved Cleanup Action Plan in accordance with the schedule as required under a Model Toxics Control Act order or decree prior to conducting any ground-disturbing construction activities within the CGA Site.
 - Justification - Ecology will require any cleanup action be protective of human health and the environment, including setting appropriate soil, groundwater, sediment, and surface water cleanup levels (where applicable). This includes requiring that all applicable, relevant, and appropriate requirements are met – which includes the state’s water quality standards.
 - Citation - Chapter 70A.305 RCW, Chapter 70A.300 RCW, Chapter 90.48 RCW, Chapter 173- 200 WAC, Chapter 173-201A WAC, Chapter 173-204 WAC, Chapter 173-303 WAC, and Chapter 173-340 WAC

C. WATER QUALITY CRITERIA AND MONITORING

1. This WQC Order does not authorize the Project Proponent to exceed applicable water quality standards beyond the limits established in Chapter 173-201A WAC, except as authorized by this WQC Order.
 - Justification - This condition ensures compliance with water quality standards to protect surface waters of the state. Ecology must protect waters of the state from potential discharges of pollution that can affect water quality and protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
2. Water Quality of the reservoir water to be discharged to Swale Creek shall meet the following limits, along with the specified water quality criteria within the NPDES permit for this discharge.
 - a. Temperature - February 15 through June 1, the 7-day average daily maximum temperature value must not exceed 16°C (60.8°F).
 - b. pH – pH shall be within the range of 6.5 to 8.6 with a human-caused variation within the above range of less than 0.2 units.
 - c. DO – 10 mg/l or 95% saturation.
 - Justification - This condition ensures compliance with water quality standards to protect surface waters of the state. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to

protect aquatic life and beneficial uses.

- Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, WAC 173-204-400, and WAC 173-225-010.
3. The Project Proponent shall conduct water quality monitoring as described in the WQMP Plan, identified in Table 1 (hereafter referred to as the WQMP), unless otherwise required in the WQC Order or NPDES permit(s) issued for this project.
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution and prevent exceedances of the water quality standards that protect aquatic life and beneficial uses.
 - Citation - RCW 90.48, RCW 90.48.030, Chapter 173-201A WAC, 173-201A-300-330 and WAC 173-225-010.
 4. The Project Proponent shall revise the Draft Water Quality Monitoring Plan (Plan), identified in Table 1, to be consistent with the conditions of this WQC Order and with any NPDES permit issued for this project. The revised Plan shall be submitted to Ecology's Federal Permit Manager (per Condition A.2 of this Order) for review at least 30 days prior to beginning any work covered by this WQC Order.
 - Justification - This condition is necessary to ensure that the monitoring and BMPs that are proposed by the Project Proponent and authorized by Ecology are conducted to protect water quality. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
 5. Monitoring results shall be submitted annually or as required by the NPDES permit(s) to Ecology's Federal Permit Manager, per condition A.2 and the requirements of the permit(s).
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution and prevent exceedances of the water quality standards that protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
 6. Ecology may ask or could use its discretionary authority to require the Project Proponent to provide mitigation and/or additional monitoring if the monitoring results indicate that the water quality standards have not been met.

- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution and ensure that aquatic life and beneficial uses are protected.
- Citation - RCW 90.48, RCW 90.48.010, RCW 90.48.030, RCW 90.48.080, RCW 90.48.120, Chapter 173-201A WAC, 173-201A-300-330 WAC, and Chapter 173-204 WAC.

D. PLANS TO BE IMPLEMENTED BY THE PROJECT PROPONENT

1. Revised or additional plans are required from the Project Proponent throughout this document. These plans shall be provided to Ecology for review (Per A.2.), either prior to commencing construction or as specified for each plan below. It is the Project Proponent's responsibility to provide the information in a timely manner.
 - Justification - Ecology needs to be aware of any proposed changes to the project by reviewing any updated or new plans to ensure that the conditions of this WQC Order and the water quality standards and other applicable state laws are met.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-201A WAC, and WAC 173-225- 010.
2. The Project Proponent shall finalize the following plans and implement them once Ecology has provided written notification that our review has been completed:
 - a. Goldendale Draft Mitigation and Planting Plan Rev 2
 - b. Goldendale Draft SWPPP (CSGP) Rev 2
 - c. Goldendale Draft Dewatering Plan Rev 2
 - d. Goldendale Draft WQ Monitoring Plan Rev 2
 - Justification - Ecology needs to be provided the final plans for the project to ensure that the conditions of this WQC Order can be and the water quality standards and other applicable state laws are met.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-201A WAC, and WAC 173- 225-010.
3. The Project Proponent shall prepare plans describing the cleanup actions and WSI closure in accordance with the requirements and schedule put forth in the Model Toxics Control Act order or decree. These plans at a minimum shall meet the requirements of WAC 173-340-400 and Chapter 173-303 WAC, and include detailed engineering design documents and specific protocols for implementation of the Cleanup Action Plan.
 - Justification - Ecology must ensure that the cleanup actions are designed, constructed and operated in a manner that is consistent with the Cleanup Action

Plan, accepted engineering practice, and the requirements of applicable or relevant and appropriate state and federal law.

- Citation – Chapter 70.105 RCW, Chapter 70A.305 RCW, Chapter 90.48 RCW, Chapter 173-201A WAC, Chapter 173-225 WAC, Chapter 173-340 WAC, and Chapter 173-303 WAC.

E. NOTIFICATION REQUIREMENTS

1. The following notifications shall be made via phone or e-mail (e-mail is preferred) to Ecology's Federal Permit Manager via e-mail to fednotification@ecy.wa.gov and cc to loree.randall@ecy.wa.gov. Notifications shall be identified with WQC Order No. 21703, FERC No. 14861, Corps Reference No. NWS-202100572, and include the Project Proponent name, project name, project location, project contact and the phone number.
 - a. Immediately following a violation of state water quality standards or when the project is out of compliance with any conditions of this WQC Order;
 - b. At least ten (10) days prior to all pre-construction meetings;
 - c. At least ten (10) days prior to starting construction; and,
 - d. At least thirty (30) days prior to operation.
 - Justification - Ecology must be aware of when a project starts and ends and whether there are any issues. This allows Ecology to evaluate compliance with the state water quality requirements.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.120, Chapter 173-201A WAC, WAC 173-201A-300 - 330, Chapter 173-204 WAC, and WAC 173-225-010.
2. In addition to the phone or e-mail notification required under D.1.a. above, the Project Proponent shall submit a detailed written report to Ecology within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.
 - Justification - Ecology has independent state authority to ensure protection of state water quality. This condition is intended to assure the Project Proponent remains in full compliance with state water quality requirements for the duration of the project.
 - Citation - Chapter 90.48 RCW, RCW 90.48.120, Chapter 173-201A WAC, and WAC 173-225- 010.
3. If the project construction has not started within 13 months of issuance of this WQC Order, the Project Proponent shall submit per Condition A.2 a written construction status report and submit status reports every 12 months until construction begins.

- Justification - Ecology must be aware of when a project starts and ends and whether there are any issues. This allows Ecology to evaluate compliance with the state water quality requirements.
- Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.120, Chapter 173-201A WAC, WAC 173-201A-300 - 330, Chapter 173-204 WAC, and WAC 173-225-010.

F. TIMING

1. This WQC Order is effective upon issuance of the FERC license for this project and will remain valid for the duration of the associated license for the project.
 - Justification - Certifications are required for any license or permit that authorizes an activity that may result in a discharge or fill material into waters. This WQC Order is not valid until the Federal agency issues a permit. Additionally, Ecology needs to be able to specify how long the WQC Order will be in effect.
 - Citation - Chapter 90.48 RCW, Chapter 173-201A WAC, and WAC 173-225-010.
2. It is estimated that the initial fill quantity of 7,640 acre-feet at a rate of 21 cubic feet per second (cfs) will take approximately 6 months. The Project Proponent must plan for this to occur across a 2-calendar-year period (e.g., about 3 months at the end of one calendar year, and the first 3 months of the subsequent calendar year) to comply with the consumptive use quantity authorized by the KPUD water right.
 - Justification - Ecology must promote and protect the interests of the public waters of the state and preserve its natural resources and aesthetic values. Currently available consumptive portions of KPUD's water right total 4,137 acre-feet per year, thus requiring the reservoir to be filled across two or more calendar years.
 - Citation - Chapter 90.03 RCW, RCW 90.03.005, Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, RCW 90.48.260, Chapter 90.54 RCW, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, WAC 173-225-010, Chapter 508-12 WAC, and WAC 508-12-260.

G. CONSTRUCTION

GENERAL CONDITIONS

1. Construction stormwater, sediment, and erosion control Best Management Practices (BMPs) suitable to prevent exceedances of state water quality standards shall be in place before starting construction and shall be maintained throughout the duration of the activity.
 - Justification - Disturbed areas without appropriate BMPs and construction methods can discharge excess sediment to waters of the state and degrade water quality. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.

- Citation - Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300-330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.
2. All clearing limits, stockpiles, staging areas, and trees to be preserved shall clearly be marked prior to commencing construction activities and maintained until all work is completed for each project.
 - Justification - Ensures that the project proponent preserves sensitive areas from discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
 3. Within the project limits³³ all environmentally sensitive areas including, but not limited to, wetlands, wetland buffers, riparian buffers and mitigation areas shall be fenced with high visibility construction fencing (HVF), prior to commencing construction activities. All field staff shall be trained to recognize HVF, understand its purpose and properly install it in the appropriate locations. HVF shall be maintained until all work is completed.
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
 4. No petroleum products, fresh concrete, lime or concrete, chemicals, or other toxic or deleterious materials shall be allowed to enter waters of the state.
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
 5. All construction debris, and other solid waste material shall be properly managed and disposed of in an upland disposal site approved by the appropriate regulatory authority.
 - Justification - Ecology must be assured that the Project Proponent is managing and

³³ Project limits include mitigation sites, staging areas, borrow sources, and other sites developed or used to support project construction.

disposing of material to protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.

- Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
6. Applicant shall ensure that fill (soil, gravel, or other material) placed for the proposed project does not contain toxic materials in toxic amounts.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300-330, WAC 173-204-120, and WAC 173-225-010.
7. If seeding is used for temporary erosion control, it must be a seed mix consisting of native, annual, non-invasive plant species.
- Justification - Establishment of native species are a necessary element of wetland mitigation. Planting mixes must not contain non-native, invasive species, including noxious weeds since they will inhibit the success of the mitigation site and plan. Noxious weeds are a subset of invasive species that have been classified according to the seriousness of the threat they pose. Governments and landowners are required to control them.
 - Citation - 40 CFR 131.12, Chapter 16-228-1400 WAC, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A-300, WAC 173-225-010, and WAC 173-226-110.

EQUIPMENT AND MAINTENANCE

8. Stock piles and staging areas must be located a minimum of 25-feet, from waters of the state, including wetlands and their buffers, unless otherwise requested by the Project Proponent.
- Justification - Requiring a minimum setback ensures that material will not end up in waters of the state. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.

9. Equipment used for this project shall be free of external petroleum-based products while used around the waters of the state, including wetlands. Accumulation of soils or debris shall be removed from the drive mechanisms (wheels, tires, tracks, etc.) and the undercarriage of equipment prior to its use around waters of the state, including wetlands.
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
10. Trucks hauling soil or contaminated media off site shall implement protective measures to avoid dust escaping or leaching.
 - Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 70.105D RCW, RCW 90.48, 90.48, RCW 90.48.030, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300-330, Chapter 173-204 WAC, and WAC 173-225- 010.
11. No equipment shall enter, operate, be stored, or parked within any sensitive area except as specifically provided for in this WQC Order.
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
12. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills.
 - Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, Chapter 173-200, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
13. Wash water containing oils, grease, or other hazardous materials resulting from washing of equipment or working areas shall not be discharged into state waters. The Project Proponent

shall set up a designated area for washing down equipment.

- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
14. A separate area shall be set aside, which does not have any possibility of draining to surface waters, for the wash-out of concrete delivery trucks, pumping equipment, and tools.
- Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
15. Concrete process water shall not enter waters of the state unless treated to meet the requirements of the Construction Stormwater General Permit or the Sand and Gravel General Permit, whichever is most protective. Any concrete process/contact water discharged from a confined area with curing concrete shall be contained and treated to meet state water quality standards or applicable permit requirements prior to discharge.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, Chapter 173-220 WAC, and WAC 173-225-010.
16. All excavated sediment shall be disposed upland in an approved disposal site, unless otherwise authorized by this WQC Order.
- Justification - Ecology must be assured that the Project Proponent is managing and disposing of sediment to protect water quality and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.

DEWATERING

17. Turbid de-watering water associated with construction shall not be discharged directly to

waters of the state, including wetlands, unless it meets the limitations set in applicable discharge permits.

- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, C Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, Chapter 173-220 WAC, and WAC 173-225-010.
18. Clean de-watering water associated with construction activities that has been tested and confirmed to meet water quality standards may be discharged directly to waters of the state including wetlands. The discharge outfall method shall be designed and operated so as not to cause erosion or scour in the stream channel, banks, or vegetation.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
19. Dewatering water may not be discharged to waters of the state unless it meets Water Quality Standards (Chapter 173-201A WAC and Chapter 173-200 WAC) or permit limits at the point of discharge, unless otherwise authorized by this WQC Order. Dewatering water from the CGA Site may not be discharged to waters of the state unless it meets Model Toxics Control Act cleanup levels including those for surface water and sediment (Chapter 173-340 and Chapter 173-204).
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation – Chapter 70A.305 RCW, Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204- 120, WAC 173-225-010, and WAC 173-340.
20. The dewatering outfall or method of discharge shall be designed and operated so as not to cause erosion or scour in state waters, banks, or vegetation.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.

- Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.

21. All equipment associated with dewatering activities shall be properly operated and maintained.

- Justification - Maintained equipment is less likely to fail or leak pollutants. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
- Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.

CONTAMINATED MATERIAL MANAGEMENT

22. Contaminated materials are known to be present within the project site. Contaminated materials shall be managed in accordance with the detailed cleanup plans specified in Condition D.3 of this WQC Order.

- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
- Citation - Chapter 70.105D RCW, Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300 - 330, Chapter 173-204 WAC, and WAC 173-225-010.

23. Remedial actions to address contaminated materials shall be implemented per the requirements of this WQC Order, water quality permits, Cleanup Action Plan and implementing MTCA order or decree, and the detailed cleanup plans specified in Condition D.3 of this WQC Order. Contaminated materials shall be managed and disposed of in accordance with state and local regulations.

- Justification - Ecology must be assured that the Project Proponent is managing and disposing of contaminated materials to protect water quality and beneficial uses.
- Citation - Chapter 70.105D RCW, Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300 - 330, Chapter 173-204 WAC and WAC 173-225-010.

24. Post-removal soil sampling shall be conducted per the Cleanup Action Plan, implementing MTCA order or decree, and detailed cleanup plans specified in Condition D.3 of this WQC Order.

- Justification - This condition is necessary to ensure that contaminated materials with the potential to impact water quality and beneficial uses have been addressed.

- Citation - Chapter 70.105D RCW, Chapter 90.48 RCW, RCW 90.48.030, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300 - 330, Chapter 173-204 WAC and WAC 173-225-010.
25. If new information regarding contamination at the project site is discovered, including the nature, quantity, migration, pathway, or mobility of hazardous substances, it must be reported to Ecology (per A.2.). Ecology will direct additional remedial action under the MTCA order or decree.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 70.105D RCW, RCW 90.48, 90.48, RCW 90.48.030, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 173-201A-300-330, Chapter 173-204 WAC, and WAC 173-225- 010.

H. AQUATIC RESOURCE MITIGATION CONDITIONS

1. The Project Proponent shall mitigate aquatic resource impacts as described in Draft Mitigation and Planting Plan Rev 2 (hereafter called the “Mitigation Plan”) as identified in Table 1 or as required by this WQC Order.
 - Justification - Alteration of water quality necessitates the use of mitigation as a method of controlling pollution. When adequate mitigation is provided, the impacts are not considered significant enough to water quality, at least in the long-term. The water quality standards, along with mitigation, protect wetlands as well as permitting some level of degradation where unavoidable or necessary.
 - Citation - 33 CFR 332, 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A-300, and WAC 173-225-010.
2. The Project Proponent shall have a qualified professional at the Aquatic Resource mitigation site to supervise during construction and planting.
 - Justification - Mitigation success is critical to achieving control of pollution. Supervision of qualified professionals helps ensure success.
 - Citation - 40 CFR 131.12, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A- 300, and WAC 173-225-010.
3. Unless otherwise authorized by this WQC Order, the Project Proponent shall begin the compensatory mitigation project concurrently with, impacting aquatic resources S7 and S8. Otherwise, Ecology may require the Project Proponent to provide additional compensation to account for additional temporal loss of aquatic resource functions.

- Justification - Mitigation that is not emplaced concurrent with impacts will result in degradation of existing beneficial uses of the wetlands affected by the proposed action.
 - Citation - 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii, WAC 173-201A-300, and WAC 173-225-010.
4. To minimize sediment releases, re-introduction of water into the mitigation stream channel shall be done gradually, and at a rate not higher than the normal flow.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300-330, WAC 173-204-120, and WAC 173-225-010.
5. The Project Proponent shall not use hay or straw on exposed or disturbed soil at the mitigation site(s), unless otherwise provided for in the Mitigation Plan.
- Justification - Straw can be a source of noxious weeds which are a subset of invasive species that have been classified according to the seriousness of the threat they pose. Governments and landowners are required to control them. Noxious weeds can inhibit the success of a mitigation site. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - WAC 16-228-1400, WAC 173-225-010, and WAC 173-226-110 WAC.
6. Aquatic herbicides can be used or applied only by certified applicators or persons under the direct supervision of a certified applicator, and only for those uses covered by the certified applicator's license category.
- a. Applicators are required to be permitted under Ecology's Noxious Weed Control Permit.
 - b. Applicators shall comply with all conditions of the Noxious Weed Control Permit.
- Justification - Noxious weeds are a subset of invasive species that have been classified according to the seriousness of the threat they pose. Governments and landowners are required to control them. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - WAC 16-228-1400, WAC 173-225-010, and WAC 173-226-110.
7. If weed-barrier fabric is used on the site, the Project Proponent shall use only water-

permeable, fully biodegradable, non-toxic weed-barrier fabric for the entire-site and/or individual plant weed control. If use of non-biodegradable plastic weed-barrier fabric is proposed in the mitigation plan approved by Ecology, it shall be used only at the base of individual plants and shall be removed before it starts to break down, before it interferes with plant growth, or before the end of the monitoring period, whichever comes first.

- Justification - The establishment of hydrophytic vegetation and substrate characteristics, is a necessary element of the mitigation plan and is promoted by weed suppression. Suppression of weeds is necessary until hydrophytic vegetation is established, after which time the presence of the fabric will hinder vegetation establishment and may affect mitigation success.
 - Citation - 40 CFR 131.12, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A- 300, and WAC 173-225-010.
8. If solid or mesh plant protector tubes are used on the mitigation site(s), Ecology strongly recommends that the Project Proponent use fully biodegradable options. If non-biodegradable plant protection options are used, they shall be removed before they interfere with plant growth or before the end of the monitoring period, whichever comes first.
- Justification - This requirement provides assurance that the mitigation site has the best chance at being successful in achieving wetland conditions. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - 40 CFR 131.12, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), and WAC 173- 201A-300.
9. Treated water added to the mitigation stream alignment from the upper reservoir shall be discharged in a manner and at a rate not higher than the normal flow to prevent erosion or scour to the channel, banks, or vegetation.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.

MITIGATION SITE MONITORING AND MAINTENANCE

10. After completing construction and planting of the mitigation sites(s), the Project Proponent shall submit to Ecology (see A.2) an as-built report, including plan sheets, documenting site conditions at Year Zero. The as-built report must:

- a. Be submitted within 90 days of completing construction and planting.
 - b. Include the information listed in Attachment B (Information Required for As-built Reports).
 - Justification - This condition is necessary to ensure the mitigation site was constructed and planted per the approved mitigation plan and serves as a baseline for monitoring performance standards, which must be met to ensure success of the mitigation site.
 - Citation - 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A-300 and WAC 173-225-010.
11. The Project Proponent shall water and maintain all mitigation site plantings so as to meet the Mitigation Plan's performance standards. If an irrigation system is installed, it shall be removed by the end of year three unless otherwise provided for in the Mitigation Plan.
- Justification - Designing and implementing an appropriate maintenance plan is crucial to the success of a mitigation site.
 - Citation - 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A-300, and WAC 173-225-010.
12. The Project Proponent shall monitor the mitigation site for a minimum of five (5) years. The Project Proponent shall use the monitoring methods described on pages 14-26 of the Mitigation Plan.
- Justification - A monitoring plan describes the methods used to collect and analyze data needed to show that performance standards are being met. Monitoring plans are necessary to track environmental changes at mitigation sites to ensure success of the mitigation site.
 - Citation - 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A-300 and WAC 173-225-010.
13. The Project Proponent shall submit to Ecology (see A.2) monitoring reports documenting mitigation site conditions annually for years 1, 2, 3, and 5. The monitoring reports must:
- a. Be submitted by December 31 of each monitoring year.
 - b. Include the information listed in Attachment C (Information Required for Monitoring Reports).

- Justification - Monitoring reports track the environmental progress of the mitigation site, and are necessary to track environmental changes at mitigation sites to ensure success of the mitigation site.
 - Citation - 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A- 260 (3)(i-ii), WAC 173-201A-300 and WAC 173-225-010.
14. Prior to implementing contingency measures not specified in the Mitigation Plan, the Project Proponent shall consult with Ecology.
- Justification - A contingency plan is necessary in case the actions undertaken for the mitigation fail or only partially succeed. A contingency plan contains corrective measures that will be taken if monitoring indicates that performance standards are not being met. The contingency plan should outline the steps that will be taken for each performance standard if it is not met.
 - Citation - 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i- ii), WAC 173-201A-300 and WAC 173-225-010.
15. When necessary to meet the mitigation performance standards, the Project Proponent shall replace dead or dying plants with the same species, or an appropriate native plant alternative, during the current or upcoming planting season and note species, numbers, and approximate locations of all replacement plants in the subsequent monitoring report.
- Justification - Performance standards must be met to ensure success of the mitigation site.
 - Citation - 40 CFR 131.12, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A- 300 and WAC 173-225-010.
16. If the Project Proponent has not met all compensatory mitigation conditions by the end of the monitoring period, Ecology may require additional monitoring, additional mitigation, or both. Conditions include specifications in the approved Mitigation Plan, such as performance standards for the mitigation site.
- Justification - If the mitigation site is not meeting all compensatory mitigation conditions, then the water quality impacts will not be offset by the mitigation.
 - Citation - 40 CFR 131.12, 40 CFR 230, subpart J, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i- ii), WAC 173-201A-300 and WAC 173-225-010.
17. While construction is occurring, the project proponent shall have a qualified wetland professional, use the currently approved federal wetland delineation manual and appropriate regional supplement to delineate wetlands W6, W1, and W2 every year during the wettest

portion of the growing season and for five years after construction has been completed to ensure the wetlands' hydrology is not impacted by the project. Wetland delineation reports must be submitted to Ecology each year by December 31 for review.

- Justification - Ecology must ensure that the construction of the project does not impact unintended waters of the state in order to ensure and protect our states water quality standards.
- Citation - 40 CFR 131.12, Chapter 47.85.040 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A WAC, WAC 173-201A-260 (3)(i-ii), WAC 173-201A- 300 and WAC 173-225-010.

I. EMERGENCY/CONTINGENCY MEASURES

1. The Project Proponent shall provide a Spill Control Plan for review by Ecology 30 days prior to commencing construction. The Spill Control Plan shall include protocols for handling and containing hazardous material during project construction, operation, and maintenance. The Spill Control Plan shall address potential issues resulting from spills during construction operation, or maintenance. The plan shall include:
 - a. a description of project operations;
 - b. the general types of oil or hazardous materials in use and stored;
 - c. a project plan map indicating hazardous substance storage areas;
 - d. materials handling procedures and storage requirements;
 - e. spill cleanup procedures for areas and processes in which spills may occur;
 - f. training of key training of key personnel in the implementation of the plan;
 - g. the posting of summaries of the plan around the project to facilitate implementation of response actions;
 - h. revising the plan as conditions or operations change at the project (e.g., from construction to operations);
 - i. 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.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life

and beneficial uses. Any hazardous material spills or equipment leaks at this site could allow contaminants to migrate into surface waters, which could degrade water quality and adversely affect fish and wildlife.

- Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, RCW 90.48.260, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, and WAC 173-225-010.
2. The Project Proponent shall have adequate and appropriate spill response and cleanup materials available on site to respond to any release of petroleum products or any other material into waters of the state.
- Justification - Ecology must have assurance that the Project Proponent has the material readily available in WQC Order to address any spills that might occur to protect waters of the state. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, RCW 90.56.280, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, WAC 173-225-010, and WAC 173-303-145.
3. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters.
- Justification - Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, RCW 90.56.280, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, WAC 173-225-010, and WAC 173-303-145.
4. Discharges of oil, fuel, or chemicals into state waters or onto land with a potential for entry into state waters is prohibited. If such work, conditions, or discharges occur, the Project Proponent shall notify Ecology's Federal Permit Manager, per condition A.2, and immediately take the following actions:
- a. Cease operations at the location of the non-compliance.
 - b. Assess the cause of the water quality problem and take appropriate measures to correct the problem and prevent further environmental damage.
 - c. In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible, taking precedence over

normal work. Cleanup shall include proper disposal of any spilled material and used cleanup materials.

- d. Immediately notify Ecology's Regional Spill Response Office and the Washington State Department of Fish and Wildlife with the nature and details of the problem, any actions taken to correct the problem, and any proposed changes in operation to prevent further problems.
- e. Immediately notify the National Response Center at 1-800-424-8802, for actual spills to water only.
 - Justification - This condition is necessary to prevent oil and hazardous materials spills from causing environmental damage and to ensure compliance with water quality requirements. The sooner a spill is reported, the quicker it can be addressed, resulting in less harm. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, RCW 90.56.280, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, WAC 173-225-010, and WAC 173-303-145.
5. Notify Ecology's Regional Spill Response Office immediately if chemical containers (e.g., drums) are discovered on-site or any conditions present indicating disposal or burial of chemicals on-site that may impact surface water or ground water.
 - Justification - Oil and hazardous materials spills cause environmental damage. The sooner a spill is reported, the quicker it can be addressed, resulting in less harm. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.
 - Citation - Chapter 90.48 RCW, RCW 90.48.030, RCW 90.48.080, Chapter 90.56 RCW, RCW 90.56.280, Chapter 173-201A WAC, WAC 173-201A-300 - 330, WAC 173-204-120, WAC 173-225-010, and WAC 173-303-145.

Attachment B

Information Required for As-built Reports

Goldendale Energy Storage Project Ecology Order # 21703

And

Corps Reference # 202100572

Ecology requires the following information for as-built reports submitted under this Order. Ecology will accept additional information that may be required by other agencies.

Background Information

1. Project name.
2. Ecology Order number and the Corps reference number.
3. Name and contact information of the person preparing the as-built report. Also, if different from the person preparing the report, include the names of:
 - a) The applicant
 - b) The landowner
 - c) Qualified professional on site during construction of the mitigation site(s).
 - d) Date the report was produced.

Mitigation Project Information

4. Brief description of the **final** mitigation project with any changes from the approved plan made during construction. Include:
 - a) **Actual** area of stream and buffer establishment.
 - b) Important dates, including:
 - i. Start of project construction.
 - ii. When work on the mitigation site began and ended.
 - iii. When different activities such as grading, removal of invasive plants, installing plants, and installing habitat features began and ended.
5. Description of any problems encountered and solutions implemented (with reasons for changes) during construction of the mitigation site(s).
6. List of any follow-up actions needed, with a schedule.
7. Vicinity map showing the geographic location of the site(s) with landmarks.
8. Mitigation site map(s), 8-1/2" x 11" or larger, showing the following:
 - a) Boundary of the site(s).
 - b) Topography (with a description of how elevations were determined).
 - c) Installed planting scheme (quantities, densities, sizes, and approximate locations of plants, as well as the source(s) of plant material).

- d) Location of habitat features.
- e) Location of permanent photo stations and any other photos taken.

Include the month and year when each map was produced or revised. The site map(s) should reflect on-the-ground conditions after the site work is completed.

- 9. Photographs taken at permanent photo stations and other photographs, as needed. Photos must be dated and clearly indicate the direction from which each photo was taken. Photo pans are recommended.

Attachment C

Information Required for Monitoring Reports

Goldendale Energy Storage Project Ecology Order # 21703

And

Corps Reference # 202100572

Ecology requires the following information for monitoring reports submitted under this Order. Ecology will accept additional information that may be required by other agencies.

Background Information

- 1. Project name.
- 2. Ecology Order number and the Corps reference number.
- 3. Name and contact information of the person preparing the monitoring report. Also, if different from the person preparing the report, include the names of:
 - a) The applicant
 - b) The landowner
 - c) The party responsible for the monitoring activities
- 4. Dates the monitoring data were collected.
- 5. Date the report was produced.

Mitigation Project Information

- 6. Brief description of the mitigation project, including area and mitigation type(s) (re-establishment, rehabilitation, creation, enhancement, preservation, upland, buffers).
- 7. Description of the monitoring approach and methods. For each performance standard being

measured provide the following information:

- a) Description of the sampling technique (e.g., monitoring point for soil or hydrology, line or point intercept method, ocular estimates in individually placed plots). If you are using a standardized technique, provide a reference for that method.
 - b) Size and shape of plots or transects.
 - c) Number of sampling locations and how you determined the number of sampling locations to use.
 - d) Percent of the mitigation area being sampled.
 - e) Locations of sampling (provide a map showing the locations), how you determined where to place the sampling locations (e.g., simple random sample), and whether they are permanent or temporary.
 - f) Schedule for sampling (how often and when).
 - g) Description of how the data was evaluated and analyzed.
8. Summary table(s) comparing performance standards with monitoring results and whether each standard has been met.
 9. Discussion of how the monitoring data were used to determine whether the site(s) is meeting performance standards.
 10. Goals and objectives and a discussion of whether the project is progressing toward achieving them.
 11. Summary, including dates, of management actions implemented at the site(s), for example, maintenance and corrective actions.
 12. Summary of any difficulties or significant events that occurred on the site that may affect the success of the project.
 13. Specific recommendations for additional maintenance or corrective actions with a timetable.
 14. Photographs taken at permanent photo stations and other photographs, as needed. Photos must be dated and clearly indicate the direction the camera is facing. Photo pans are recommended.
 15. Vicinity map showing the geographic location of the site(s) with landmarks.
 16. Mitigation site map(s), 8-1/2" x 11" or larger, showing the following:
 - a) Boundary of the site(s).
 - b) Location of permanent photo stations and any other photos taken.

- c) Data sampling locations, such as points, plots, or transects.
- d) Approximate locations of any replanted vegetation.
- e) Changes to site conditions since the last report, such as areas of regrading, shift in habitat features, or a change in water regime.
- f) Include the month and year when each map was produced or revised. The site map(s) should reflect on-the-ground conditions during the most recent monitoring year.

Document Content(s)

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