RECLAMATION

Managing Water in the West

Finding of No Significant Impact

Final Environmental Assessment

Grand Coulee G1 through G18 Generating Units Modernization and Overhaul

Grand Coulee Project, Washington

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region Office
Boise, Idaho

August 2018

U.S. DEPARTMENT OF THE INTERIOR

The mission of the U.S. Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to tribes.

BUREAU OF RECLAMATION

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Finding of No Significant Impact
and Decision
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Modernization and Overhaul

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PN FONSI 17-03

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Introduction

The Bureau of Reclamation has prepared this Finding of No Significant Impact (FONSI) to comply with the Council on Environmental Quality's regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA). This document briefly describes the proposed action, the alternatives considered, the environmental consequences expected from implementation of the alternatives, the scoping process, Reclamation's consultation and coordination activities, and Reclamation's finding. The final Environmental Assessment (EA), attached, fully documents the analysis.

Background

The purpose of the Project is to replace and upgrade existing components of the left and right powerhouses that are exhibiting substantial age-related wear and to increase the operational reliability and flexibility of the powerhouses. The need for the action is to ensure continued operation to provide electrical power while maintaining hydraulic capacity. Many of the plant's principal components are being operated far beyond their intended service life, which may lead to increased hardware failures and forced outages and increasingly challenging repairs resulting from obsolescence and lack of spare parts. In order to avoid unplanned outages for repair, Reclamation proposes to address the needed overhaul in a planned approach.

Decision

Based on the analysis in the EA, it is my decision to select for implementation the Preferred Alternative (Alternative B). This action will best meet the Purpose and Need identified in the EA.

Alternatives Considered

The EA analyzed three alternatives for the Project: Alternative A – No Action, Alternative B – Grand Coulee G1 through G18 Modernization and Overhaul – Work on Two Units at a Time (Preferred Alternative); and Alternative C – Grand Coulee G1 through G18 Modernization and Overhaul – Work on One Unit at a Time.

Alternative A – No Action

Under the No Action alternative, Reclamation would continue operating the G1 through G18 generating units with no scheduled component modernization and overhaul. The 18 units would continue generating power until a failure occurs, at which time the generating unit would be taken offline and overhaul would be done. Because the modernization and overhaul work would not be planned under this Alternative, units may be offline for extended periods. Repair costs and time needed to obtain replacement parts would likely continue to increase based on the aging technology and the scarcity of parts. Age-related wear issues would remain and may become worse over time. Unit components would be modernized and overhauled as failure occurred.

Alternative B – Grand Coulee G1 through G18 Modernization and Overhaul – Work on Two Units at a Time – Preferred Alternative

Under Alternative B, Reclamation would overhaul the 18 generating units in the left and right powerhouses. The modernization and overhaul work would include work on the generators, windings, stator core, penstocks, exciters, iso-phase bus, and internal and external cranes. The objective would be to repair and restore these machines for reliable operation for an additional 30 years in a timely manner while maintaining hydraulic capacity at Grand Coulee. Work would occur on two of the 18 units at a time (in the left powerhouse and right powerhouse combined). All work would progress in a coordinated manner. Reclamation anticipates the construction portion of the Project would occur from 2018 to 2029, but unforeseen circumstances (for example, equipment breakdown, unexpected outages, or manufacturing delays) could delay completion.

Alternative C – Grand Coulee G1 through G18 Modernization and Overhaul – Work on One Unit at a Time

This alternative would be similar to the Alternative B, but rather than completing work on two generating units at a time, work would only occur on one unit at a time. This would extend the work out an additional 6 or 7 years, depending on the speed of completion.

Summary of Environmental Consequences

The following is a summary of the environmental consequences of the Preferred Alternative, inclusive of direct, indirect, and cumulative effects. The attached EA contains a full description of the environmental consequences.

Fisheries

Under the Preferred Alternative, no effects to the fisheries in Franklin D. Roosevelt Reservoir (Lake Roosevelt) or in the Columbia River downstream of Grand Coulee Dam are expected. Reclamation is not proposing to change reservoir operations or hydropower operations under the Preferred Alternative. Aquaculture operations and fish collection facilities below the dam and any fishing opportunities in the surrounding area would not be affected by this Project.

Comment letters received on the draft EA expressed concern about the Project's impact on the potential reintroduction of anadromous salmon at Grand Coulee and potential passage facilities. Because the Project is not changing operations or configuration at Grand Coulee, Reclamation determined that there would be no impact or new limitations to any future reintroduction or passage projects. Modifications that would hinder or promote either reintroduction or passage were not proposed.

Water Resources/Hydrology

No changes to surface or groundwater quality, quantity, or surface flows are anticipated under the Preferred Alternative. Because operations are not changing, reservoir management inclusive of water levels would remain the same.

Hazardous or Toxic Wastes

Established worker safety standards and contract specifications adequately address the potential worker exposure to generated hazardous/dangerous wastes. Waste management standard operation procedures, contract specifications, and Federal, State, and local environmental regulations ensure that the potential for the release of hazardous/dangerous wastes to the environment is minimal. It is anticipated that the proposed modernization represents a minimally elevated potential for impact to human health or the environment.

Cultural Resources

The proposed modernization would not have any impact on archeological resources or properties of traditional cultural or religious significance to tribes. The Project would have an adverse effect on the National Register of Historic Places (National Register) eligible Grand Coulee Dam historic district as a result of the replacement of the G1-G6 floor-mounted exciters, five bridge cranes, and four gantry cranes. When an undertaking is found to have an adverse effect, Section 106 requires consultation with the State Historic Preservation Officer (SHPO) and other interested parties regarding appropriate avoidance, minimization, or mitigation measures. The product of consultation would be a Memorandum of Agreement,

per 36 CFR 800.6(c), among Reclamation, SHPO, and the Tribal Historic Preservation Officer (THPO). Under NEPA, these adverse effects would be identified as minor impacts.

Environmental Justice

The existing demand for rental housing in the Grand Coulee area is generally considered to be high relative to the currently available supply, and the Project would be expected to contribute to that demand; however, it is not reasonably foreseeable that this would result in adverse impacts that could disproportionately affect minority and low-income populations.

Indian Sacred Sites

Based upon the review of existing information and consultations with the Confederated Tribe of the Colville Reservation Tribal Historic Preservation Office, implementation of the Preferred Alternative would not result in direct or indirect impacts to Indian sacred sites.

Indian Trust Assets

The Preferred Alternative would not result in any significant negative effects on Indian Trust Assets. The project would not involve actions on trust lands, and it would not reduce the ability of Indians to hunt, fish, and boat in the Colville or Spokane Reservations or associated trust lands. The project would not affect the amount of water available in the Columbia River, and therefore would not affect any water rights that might be claimed by the Colville or Spokane Tribes.

Transportation

Delivery truck traffic and worker commuter traffic would increase slightly during implementation of the Preferred Alternative, but not enough to generate more than negligible impacts on local traffic. Parking would be provided in a temporary contractor parking lot north of the powerhouses. Anticipated minor changes in transportation patterns and minor traffic volume increases resulting from the Preferred Alternative are not expected to result in increased risk of vehicular collisions in the vicinity of the Project.

Compliance with contract specifications and Federal and State requirements for transport of oversized loads would ensure there are no significant adverse transportation impacts associated with large loads. There would be no permanent increase in traffic with the Project.

Socioeconomics

Regional Economic Effects

The anticipated economic impact of the Preferred Alternative would occur throughout the five-county regional study area. These regional impacts would not occur uniformly each year; instead, they would vary year to year proportionate to annual regional expenditures. The majority of the output, employment, and income effects are due to the expenditures of the wages earned by the workforce involved in the modernization activities. Regional economic impacts related to modernization expenditures are estimated to result in an increase in the output of sales, regional employment, and labor income. Regional employment and

income will increase, but, when compared to the five-county region as a whole, the Project will represent less than 0.1 percent of total employment.

Local School Enrollments

The majority of the Preferred Alternative would likely be completed by contractor workforces that would be on-site and in the community only for the duration of their specific work assignment. Often, transient tradesmen and workers in these situations do not relocate their families to the temporary job location. However, in order to evaluate additional enrollment for the Grand Coulee Dam School District that could potentially result from new workers relocating to the area, Reclamation conservatively estimated that 17 to 33 new students could be enrolled in the school district as a result of this project. Unless student-based State and Federal funding levels were increased in response to the added student population, this would result in a decrease in average funding level per student of about 2.3 to 4.5 percent. It also could increase the student-to-instructional-staff ratio similarly, depending on the grade distribution of the added students. While this is an important consideration for the District's short- and long-range planning and budgeting, the majority of the funding lag is expected to be temporary (less than one academic year), and the low magnitude means that it does not rise to the level of a significant impact.

Agency Consultation and Coordination

National Historic Preservation Act of 1966

The National Historical Preservation Act (NHPA) was enacted in 1966 and requires Federal agencies to consider project-related impacts to historic properties, which includes prehistoric and historic-period archeological sites, traditional cultural properties, and elements of the built environment. The process for implementing the NHPA is defined in Federal regulations (30 CFR 800) and includes consultation with SHPO, THPO, and Advisory Council on Historic Preservation (ACHP) about Federal findings regarding project effects.

Reclamation initiated consultation under Section 106 of the NHPA with the Washington SHPO and Colville THPO regarding this Project. Information regarding consultation is provided in the attached EA and appendices.

Tribal Government Coordination and Consultation

Reclamation sent letters to the Spokane Tribe of Indians and the Confederated Tribes of the Colville Reservation notifying them of the release of the draft EA for comments and the Project was discussed in meetings and phone conversations. In addition to scoping letters received from both Tribes, Reclamation received comments from the Spokane Tribe regarding the draft EA. Our response is included in Appendix E, and the EA was edited to address comments where appropriate. Many of the comments from the Spokane Tribe focused on the discussion of how this Project intersects with potential future maintenance projects at Grand Coulee, such as drum gate overhaul, and the environmental impact

statement for Columbia River Systems Operations. Changes were made in the EA to address the Tribe's comments.

Public Involvement

Reclamation used several mechanisms to inform the public about the Project and encourage local residents, Tribal members, and agencies to engage with Reclamation during and following the scoping period. The public scoping period was from October 7, 2016, to November 21, 2016. The public was encouraged to identify issues and concerns with regard to the Project. Notices were sent to media outlets and letters were sent to Federal, State, and local agencies, elected officials, Indian tribes, and interest groups. The public scoping was also announced on Reclamation's website.

The draft EA was released to the public on April 13, 2017, for a 30-day comment period that ended on May 14, 2017. The comment letters and responses are included in Appendix E.

Changes to the Final EA

The Cultural Resources and Socioeconomics sections have been amended to include updated consultation information and reflect changes from public comments. Other edits to the final EA were made to provide additional process and background information and to comply with Deputy Secretary of the Interior Order 3360.

Finding

Based on a thorough review of the comments received and analysis of the environmental impacts as presented in the final EA and this FONSI, Reclamation has determined that implementing the Preferred Alternative will have no significant effect on the quality of the human environment or natural resources. Reclamation, therefore, concludes that preparation of an environmental impact statement is not required, and that this Finding of No Significance Impacts satisfies the requirements of NEPA.

Recommended:

8/10/18

Sonja Kokos
Ecosystems Services Program Manager
Pacific Northwest Regional Office, Boise, Idaho

Approved:

14 AUG 2018

Coleman Smith
Power Manager
Grand Coulee Power Office, Grand Coulee, Washington

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Acronyms and Abbreviations

Acronym or Abbreviation	Description
ºF	degrees Fahrenheit
ACHP	Advisory Council on Historic Preservation
APE	area of potential effect
BPA	Bonneville Power Administration
CBP	Columbia Basin Project
CEQ	Council on Environmental Quality
CTCR	Confederated Tribes of the Colville Reservation
cfs	cubic feet per second
EA	environmental assessment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FCRPS	Federal Columbia River Power System
FRM	flood risk management
FTE	full-time equivalent
GCDSD	Grand Coulee Dam School District
GCPO	Grand Coulee Power Office
ITA	Indian Trust Assets
LPH	Left Powerhouse
MT CO_2e	metric tons of CO_2 equivalent
MW	megawatts
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NOAA	National Oceanic and Atmospheric Administration
NPCC	Northwest Power and Conservation Council
NRHP	National Register of Historic Places
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PDO	property damage only
PEL	Permissible Exposure Level
Reclamation	Bureau of Reclamation
RPH	Right Powerhouse
SEPA	State Environmental Policy Act (Washington State)
SHPO	State Historic Preservation Office
SR	State Route
STOI	Spokane Tribe of Indians
TERO	Tribal Employment Rights Ordinances
THPO	Tribal Historic Preservation Officer
TCP	Traditional Cultural Property
TPP	Third Powerplant
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

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Chapter 1. Purpose and Need

1.1 Proposed Action

The Bureau of Reclamation (Reclamation) is proposing to modernize and overhaul the Left and Right Powerhouses (LPH and RPH) at Grand Coulee Dam while maintaining current reservoir operations for flood risk management (FRM) and hydropower. Many components of the powerhouses are original and have been in use since the project was first put into service. This Environmental Assessment (EA) for the Grand Coulee G1 through G18 Generating Units Modernization and Overhaul Project (Project) examines the human and natural environmental consequences of the different action alternatives to address the proposed action.

1.2 Purpose of the Action

The purpose of the action is to modernize and overhaul the power-generating units G1 through G18 in the LPH and RPH at Grand Coulee Dam, by refurbishing or replacing key components. Reclamation would maintain current operations for FRM to protect communities and generate hydropower while the project is being implemented. Current hydrologic operations would be maintained, and the Project would have no impacts on water, hydrology, or fisheries resources in the river or reservoir.

1.3 Need for the Action

The need for the Grand Coulee G1 through G18 Modernization and Overhaul Project (Project) in the LPH and RPH is to ensure continued operation and to reliably provide electrical power while maintaining hydraulic capacity. Many of the plants' principal components are being operated far beyond their intended service life, and Reclamation needs to modernize and overhaul aging components. In particular, the G1 through G18 units show problems stemming from age and wear that result in increased hardware failures and forced outages, as well as increasingly challenging repairs resulting from obsolescence and lack of spare parts. In order to avoid unplanned outages for repair, Reclamation proposes to address the needed overhaul in a planned approach.

1.4 Objectives of the Proposed Action

Reclamation has identified the following objectives for this Project:

- Replace the generating windings and stator cores of the main-unit generators,
- Install new static digital excitation systems for the main-unit generators,
- Install digital governor control systems, local unit controls, and generator relay protection systems,
- Modernize the three station service generators (LS-1, LS-2, LS-3) in the LPH,

- Replace or refurbish the iso-phase bus and circuit breakers for the 18 main-unit generators,
- Repair or replace the penstock linings, and
- Replace or overhaul the nine cranes, which service the powerhouses.

The following are operational objectives of the Project:

- Assist Grand Coulee in providing reliable hydropower generation for the long term,
- Have no impact on current hydrologic operations of the reservoir,
- Continue to generate hydropower within the LPH/RPH during Project implementation.

1.5 Background

The Columbia Basin Project (CBP) is a multipurpose development on the Upper Columbia River in central Washington. The major facilities of the CBP are Grand Coulee Dam and its impoundment (Lake Roosevelt), the Grand Coulee Powerplant complex that includes the John W. Keys III Pump-Generating Plant, Banks Lake, and Potholes Reservoir. The CBP began with fund allocation pursuant to the National Industrial Recovery Act of June 16, 1933. Grand Coulee Dam, located approximately 90 miles west of Spokane, Washington, is the primary storage and diversion structure for the CBP. The dam, one of the largest concrete structures ever constructed, is 550 feet high and 5,223 feet long. The dam was constructed from 1933 to 1941 and was modified from 1967 to 1975 by constructing a 1,170-foot-long and 210-foot-high forebay dam along the right abutment as part of the construction for the Third Powerplant (TPP) powerhouse.

Lake Roosevelt has an elevation of 1208.0 feet at minimum pool and 1290.0 feet at full pool. Lake Roosevelt has a total storage capacity of 9.4 million acre-feet (5.2 million acre-feet of active space) and extends more than 150 miles upstream to the Canadian border at full pool. The Bureau of Reclamation (Reclamation) operates Grand Coulee Dam in coordination with other projects in the Columbia River Basin to provide system flood risk management (FRM) space in Lake Roosevelt to help manage flow of the Columbia River at The Dalles.

The Grand Coulee Powerplant complex consists of three powerhouses: the Left Powerhouse (LPH) and the Right Powerhouse (RPH) located on either side of the spillway looking downstream, and the TPP on the right bank of the dam. The LPH and RPH have a total of 18 units of 125 megawatts (MW) capacity, plus three units of 10 MW capacity (a total capacity of 2,280 MW). The TPP contains three units of 690 MW capacity and three units of 805 MW capacity. The three 690 MW units will be upgraded to 770 MW when they are overhauled from 2020 to 2027. This will result in a total capacity for the TPP of 4,725 MW.

1.6 Location and General Description of Affected Area

Grand Coulee Dam and the Left and Right Powerhouses are located in north-central Washington State, just south of where the counties of Douglas, Grant, and Okanogan meet on the Columbia River. A portion of the east side of the Grand Coulee Dam and the TPP is

located within Okanogan County; its boundary is also a joint boundary for the Colville Indian Reservation. The west side of the dam is located between the communities of Coulee Dam and Grand Coulee in Grant County. There are two other smaller communities in the area, with Elmer City just north of Coulee Dam in Okanogan County, and Electric City just west of Grand Coulee in Grant County. Washington State Highway 155 connects all four communities and the site of Grand Coulee Dam. The junction of State Highways 155 and 174 is on the westerly edge of the community of Grand Coulee. Grand Coulee Dam forms the western end of the Lake Roosevelt National Recreation Area.

1.7 Authority

The CBP began with fund allocation for Grand Coulee Dam pursuant to the National Industrial Recovery Act of June 16, 1933. The Project was specifically authorized for construction by the Rivers and Harbors Act, approved August 30, 1935. The Columbia Basin Project Act of March 10, 1943 (57 Stat. 14), reauthorized the CBP, bringing it under the provisions of the Reclamation Project Act of 1939.

Congress authorized Reclamation to operate Grand Coulee Dam for the multiple purposes of FRM, navigation, generation of electricity, storage and delivery of water for irrigation, under the 1902 Reclamation Act. Congress has directed that Reclamation enter into contracts with project water users. These contracts set out, among other things, Reclamation's obligations to store and deliver project water to irrigation districts, municipalities, and other entities. Additionally, the 1902 Reclamation Act requires that Reclamation comply with state law with regard to control, appropriation, use, and distribution of waters. Water can be stored and delivered by a project only for authorized purposes for which Reclamation has asserted or obtained a state water right, in accordance with Section 8 of the Reclamation Act of 1902 and applicable Federal law. Reclamation must honor senior or prior water rights in storing and diverting project water.

Table 1. Feature and Authorized Purposes

Feature	Authorization
Construction of Grand Coulee Dam	Congress allocated funds under National Industrial Recovery Act of June 16, 1933
Columbia Basin Project	Public Law 74-409 on August 30, 1935 Reauthorized Public Law 78-8 to bring provisions under the Reclamation Project Act of 1939
Units 7, 8, and 9 of RPH	Approved by the Secretary on January 5, 1949
TPP	Public Law 89-448 on June 14, 1966, and Public Law 89-561 on September 7, 1966

1.8 Scoping and Issues

National Environmental Policy Act (NEPA) provides the opportunity for public involvement and comment during the preparation of an environmental assessment (EA). This section will summarize the public involvement and agency coordination activities that have been conducted to date for this EA.

A 30-day public scoping period was held from October 7, 2016, to November 7, 2016, and was extended to November 27, regarding Reclamation's intent to prepare an EA and requesting public comment. Information is included in Appendix A.

A 30-day public comment period for the Draft EA was held from April 13, 2017 to May 14, 2017. Information is included in Appendix B. The Final EA has been edited to incorporate comments or more information as appropriate.

1.8.1 Issues Carried Forward for Alternative Development

From the public scoping, Reclamation identified the following issues that helped frame the development of action alternatives:

- Potential impacts to fish in Lake Roosevelt and below the dam
- Potential changes in operations and how this may impact tribal fisheries resources below the dam
- Potential impacts to cultural resources
- Hydropower generation during Project implementation and potential impacts to power supply and subsequent 181D payments
- Socioeconomic impacts to the regional economy

1.8.2 Other Concerns Identified During Scoping

Some public concerns were determined to be outside the scope of this EA because they were not pertinent to the decision to be made and therefore lack a cause-and-effect relationship associated with the Project; or they would be addressed separately from this Project. These comments and Reclamation's responses are included in Chapter 4.

1.9 Regulatory Compliance

Along with the Secretarial and Congressional authorizations cited above, various laws apply to the Preferred Alternative and are summarized below.

1.9.1 National Environmental Policy Act

NEPA requires that the action agency use a public disclosure process to determine whether there are any environmental impacts associated with proposed federal actions. If there are no significant environmental impacts, a Finding of No Significant Impacts (FONSI) can be signed to complete the NEPA compliance.

1.9.2 Endangered Species Act (1973)

The Endangered Species Act (ESA) requires that Federal agency actions do not jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat. If the action may affect any listed species, the agency must consult with the USFWS or NOAA Fisheries.

1.9.3 National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires that Federal agencies consider the effects that their projects have on properties eligible for or on the National Register of Historic Places (NRHP). The 36 CFR 800 regulations provide procedures that Federal agencies must follow to comply with the NHPA. Federal agencies are required to consult with the State Historic Preservation Office (SHPO), Native American tribes with a traditional or culturally significant religious interest in the study area, the interested public and, in certain cases, the Advisory Council on Historic Preservation (ACHP).

1.9.4 Executive Order 13007: Indian Sacred Sites

Executive Order 13007, dated May 24, 1996, instructs Federal agencies to promote accommodation of access to and protect the physical integrity of American Indian sacred sites.

1.9.5 Secretarial Order 3175: U.S. Department of the Interior Responsibilities for Indian Trust Assets

Indian Trust Assets (ITA) are legal interests in property held in trust by the U.S. (with the Secretary of the U.S. Department of the Interior [Interior] acting as trustee) for Indian tribes or Indian individuals.

The U.S. has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and executive orders. This trust responsibility requires that officials from Federal agencies, including Reclamation, take all actions reasonably necessary to protect ITAs when administering programs under their control.

1.9.6 Executive Order 12898: Environmental Justice

Executive Order 12898, dated February 11, 1994, instructs Federal agencies, to the greatest extent practicable and permitted by law, to make achieving environmental justice part of its mission by addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

1.10 Other Related Actions and Activities

The following actions are related but separate because they are being done on various portions of the Grand Coulee Project and serve different purposes and needs. Separate NEPA documents have been or will be completed for the following.

1.10.1 Third Powerplant Overhaul

On April 28, 2010, a FONSI was signed authorizing the TPP overhaul and modernization, which includes work on the six generating units, turbines, shafts, and auxiliary equipment at the Grand Coulee TPP. The main portion of the overhaul work is being completed within the confines of the TPP. The following link provides documents and information regarding the TPP Project: http://www.usbr.gov/pn/programs/ea/wash/tpp/index.html.

1.10.2 John W. Keys III Pump-Generating Plant Modernization Project

On March 12, 2012, a FONSI was signed authorizing the overhaul and modernization of the John W. Keys III Pump-Generating Plant. The main portion of the overhaul work will be completed within the confines of the John W. Keys III Pump-Generating Plant. The overhaul and modernization is scheduled for completion in 2034. The following link provides documents and information regarding the Project: http://www.usbr.gov/pn/programs/ea/wash/jkpgp/index.html.

1.10.3 New Fire Station

On November 23, 2015, a FONSI was signed authorizing the construction of a new fire station at the Grand Coulee Dam facility. The following link provides documents and information regarding the Fire Station Project: https://www.usbr.gov/pn/programs/ea/wash/firestation/.

1.10.4 Drum Gate Overhaul

Reclamation anticipates needing to conduct drum gate overhaul at Grand Coulee in the near future. Due to the nature of the gates and their importance with impounding the reservoir, extensive maintenance has not been possible. The gates are reaching an age and condition which will require them to be overhauled to ensure their service for decades to come. The NEPA process for this project will begin in the next 1 to 5 years.

1.10.5 Columbia River Systems Operation

Reclamation, the Corps, and Bonneville Power Administration are preparing an Environmental Impact Statement (EIS) on the system operations and maintenance of 14 Federal multi-purpose dams and related facilities located throughout the Columbia River basin, including Grand Coulee Dam. Information can be found on the Project website, http://www.crso.info/.

Chapter 2. Description of Alternatives

2.1 Introduction

This chapter presents the alternatives being considered for the Project. They are:

- Alternative A – No Action
- Alternative B – Grand Coulee G1 through G18 Modernization and Overhaul – Work on Two Units at a time (Preferred Alternative). Under this alternative, Reclamation would complete the needed work on two generating units at a time. The work would take approximately 10 years to complete and would commence in 2019 or later, depending on contracting, design, material acquisition, emergencies, or other delays.
- Alternative C – Grand Coulee G1 through G18 Modernization and Overhaul – Work on One Unit at a time. Under this alternative, Reclamation would complete the needed work on only one generating unit at a time. The work would take approximately 17 years to complete and would commence in 2019 or later.

Figure 1 shows the location and facilities associated with the Project.

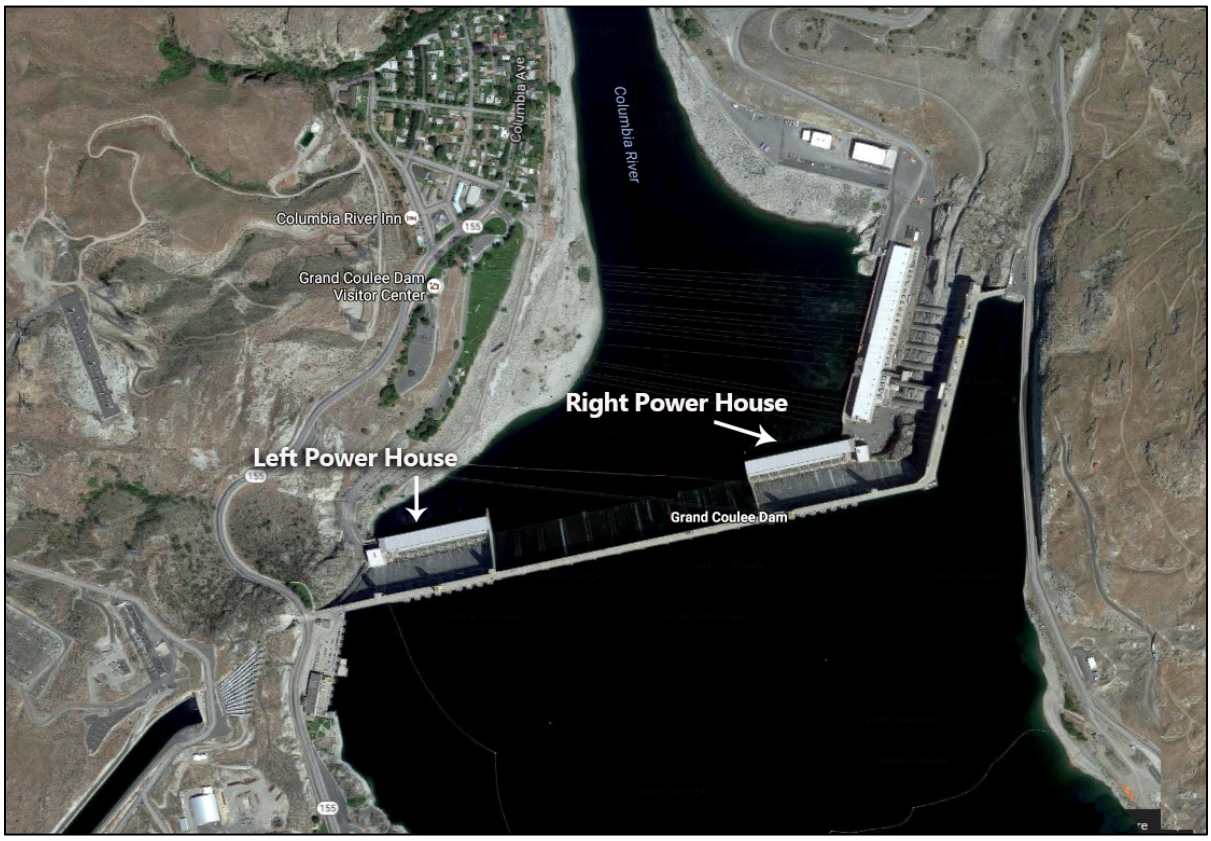


Figure 1. General Overview of Left and Right Powerhouses

2.2 Alternative A – No Action

Under the No Action alternative, Reclamation would continue operating the G1 through G18 generating units with no scheduled component modernization and overhaul. The 18 units would continue generating power until a failure occurs, at which time the generating unit would be taken offline and overhaul would be done. Because none of the modernization and overhaul work would be planned under this Alternative, units may be offline for extended periods. Repair costs and time needed to obtain replacement parts would likely continue to increase based on the aging technology and the scarcity of parts. Age-related wear issues would remain and may become worse over time. Unit components would be modernized and overhauled as failure occurred.

2.3 Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time (Preferred Alternative)

Under Alternative B, Reclamation would overhaul 18 generating units; G1 through G9 in LPH and G10 through G18 in RPH. The modernization and overhaul work would include work on the generators, windings, stator core, penstocks, and internal and external cranes. The objective would be to repair and restore these machines for reliable operation for an additional 30 years in a timely manner while maintaining hydraulic capacity at Grand Coulee. Work would occur on two of the 18 units at a time (in the LPH and RPH combined). All work would progress in a coordinated manner. Reclamation anticipates the construction portion of the Project to occur from 2018 to 2029, but unforeseen circumstances (for example, equipment breakdown, unexpected outages, or manufacturing delays) could delay completion. The overhaul work would include:

- Replacement on the generator windings and stator cores of the main-unit generators
- Installation of new static digital excitation systems for all 18 main-unit generators
- Digital governor control systems, local unit controls, and generator relay protection systems for all 18 main-unit generators
- Penstock lining repair or replacement for all 18 main-unit generators
- Replacement or modernization of the nine cranes servicing the powerhouses
- Modernization of three station service generators (LS 1 through LS 3) in the LPH
- Replacement or refurbishment of the iso-phase bus and circuit breakers for all 18 main-unit generators

Nine cranes—five inside the powerhouse and four gantry cranes on the powerhouse exteriors and on the top of the dam—will be replaced or modernized as part of this Project. These cranes are aging and provide essential services to the dam and associated facilities. Work on the cranes would proceed in an efficient manner to minimize potential impacts associated with one or more cranes being out of service.

The staging area is shown in Figure 2 on previously disturbed land. Waste material would be recycled and/or taken to an approved disposal facility. Spill prevention and containment would follow the Grand Coulee spill management plan.

Very little parking is available for contractors and workers at Grand Coulee. Therefore, contractors may be required to carpool from the staging area to the Project site.

Figure 2. Location of Staging Area (red) and Parking Area (green)

2.4 Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a time

This alternative would be similar to the above alternative, but rather than completing work on two units at a time, work would occur on only one unit at a time. This would extend the work out an additional 6 or 7 years, depending on speed of completion (Denton 2017c).

2.5 Process for Alternative Development

The alternatives were developed by identifying the key components and auxiliary features of the powerhouses that required modernization, overhauling, or replacing. Subsequently, alternative schedules were developed in accordance with the objectives for the proposed action (Section 1.4). The key objective that framed the sideboards for alternative development is that Grand Coulee would maintain current operations and hydraulic capacity of the reservoir. This means Reclamation would have no change over baseline to water quality, hydrology, or fisheries resources due to implementation of the Project. This objective was echoed in the public concerns brought forward during scoping.

The alternatives also were required to take into account the floor and work space available in the powerhouses. Limited physical space for machinery, equipment laydown, and storage of

existing machinery parts within the LPH and RPH restricted the opportunity to perform work in parallel.

2.6 Alternatives Considered but not Analyzed in Detail

Reclamation considered an alternative that would have proposed work exceeding the current operational limitations. This alternative was eliminated from further consideration because it would have changed current operations and likely resulted in impacts to hydrology and fisheries that Reclamation sought to avoid during implementation.

Chapter 3. Affected Environment and Environmental Consequences

3.1 Introduction

This chapter provides background information and a description of the study conducted for key resources potentially affected by the Project. It describes the affected environment of various resource areas within the Project area and vicinity, and evaluates the potential effects of constructing and operating the two action alternatives and the No Action Alternative. Cumulative impacts, which may result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, also are evaluated. Related actions are discussed in Section 1.7 and are included in the evaluation of cumulative impacts.

Information necessary to develop the affected environment discussion was obtained through a combination of online data review; meetings, discussions, and reports from agencies; field investigations; scoping comments; and a review of available aerial photography.

The Affected Environment referred to in each section, unless specifically mentioned otherwise, is the area potentially affected by the Federal action and includes Reclamation's property at the Grand Coulee Dam site, the staging and laydown areas, and the local/regional transportation system used to construct and supply the Project. Furthermore, the Affected Environment includes other elements of the human and natural environment directly or indirectly impacted by the current and proposed operations of the generating facility.

3.1.1 Resource Areas Not Discussed in Detail

Preliminary analysis indicated that the modernization and upgrade of the generating units has no potential to affect certain resource areas or is anticipated to affect certain resources to such a limited extent that a detailed discussion of those areas is not justified. These resource areas are soils and geology, water resources and hydrology, fisheries, vegetation, wildlife, Federally protected species, wetlands, land use, visual resources, energy, noise, wild and scenic rivers, air quality, and recreation. Because there is either no effect or very limited potential for effect, these resource areas would not influence the decision to be made regarding the Preferred Alternative and are not discussed in detail. The rationale for eliminating these resource areas from detailed discussion and further consideration is provided in the following sections.

Soils and Geology

Earth-disturbing activities on soil or geologic resources would not occur under either action alternative; therefore, soils and geology will not be addressed further in this EA.

Water Resources/Hydrology

No changes to surface or groundwater quality, quantity, or surface flows would occur under either action alternative or cumulatively. No increased spills are predicted with implementation of the Project under either action alternative, inclusive of the Preferred Alternative, and when considered with other projects occurring at Grand Coulee (see Section 1.7); therefore, there would be no cumulative effects. Because operations are not changing, reservoir management inclusive of water levels would remain the same for all alternatives. Water resources and hydrology will not be addressed further in this EA due to no effects.

Fisheries

Because no changes in the dam operations, reservoir operations or water conditions would occur, no impacts on fisheries resources would occur under either action alternative. Similarly, any aquaculture operations or fish collection facilities below the dam and any fishing opportunities in the surrounding area would be unaffected by this Project. There would be no cumulative effects, as no effects to fisheries are expected with implementation of related actions. Therefore, fisheries will not be addressed further in this EA.

Under this Project, Reclamation is proposing to change some of the electrical components of the powerhouses, as well as some physical and mechanical components (penstocks and cranes). Work is not being proposed on the mechanical components of the turbines, nor is turbine replacement proposed. It is technically infeasible to make Francis turbines fish-friendly and, because of head pressure at Grand Coulee, using Kaplan turbines would not be possible.

Comment letters received on the Draft EA expressed concern about Project impact on the potential reintroduction of anadromous salmon at Grand Coulee and potential passage facilities. Because the Project is not changing operations or configuration at Grand Coulee, Reclamation determined that there would be no impact or new limitations to any future reintroduction or passage projects. Modifications that would hinder or promote either reintroduction or passage were not proposed.

Vegetation

Earth-disturbing activities would not occur. The laydown and staging areas are on previously disturbed sites. Impacts on vegetation resources would not occur under either action alternative. There would be no cumulative effects, as no effects to vegetation are expected with implementation of related actions. Therefore, vegetation will not be addressed further in this EA.

Wildlife

No disturbance to intact habitat would occur under either action alternative. Only disturbed habitat at the laydown and staging area would be affected. There may be temporary displacement of wildlife that frequent these types of areas, but an abundance of disturbed areas are adjacent to the Project for displaced wildlife to use. Therefore, wildlife impacts are

minimal. There are no wildlife impacts associated with the related actions; therefore, wildlife will not be addressed further in this EA.

Federally Protected Species

No potential impacts to Federally protected species (migratory birds, marine mammals, and bald and golden eagles) or species listed under the ESA were identified. On March 20, 2017, Reclamation requested from USFWS a list of ESA-listed species that may occur within the Project area. The official species list is derived from a list of species that occur within a county and should be considered in an effects analysis (biological assessment) for the Project. The list of ESA-listed species that occur within the counties include: yellow-billed cuckoo, bull trout, Spalding's catchfly, and North American wolverine. No critical habitat is designated within the affected environment. Reclamation determined that the Project would have no effect on ESA-listed species and they will not be addressed further in this EA.

Wetlands

There are no wetlands within the areas to be used by the Project under either action alternative and no wetlands are impacted by related actions; therefore, wetlands will not be addressed further in this EA.

Land Use

Land use would not change under either action alternative or with implementation of the related actions; therefore, land use will not be addressed further in this EA.

Recreation

River flows and sportsman access will not be affected by the Project. The Visitor Center will remain open during construction. There are no campgrounds in the Project area. The related actions would have no recreation impacts. Therefore, there will be no impact on recreation, and recreation will not be addressed further in this EA.

Visual Resources

There may be a temporary change to visual resources when the external cranes on top of the dam are upgraded under either action alternative. This impact is considered temporary and minimal. Visual resources are addressed in more detail as they relate to historical resources in Section 3.3, Cultural Resources. Therefore, visual resources will not be impacted and will not be addressed further in this EA.

Energy

Under Alternative A – No Action, unplanned maintenance and repair work could potentially affect power generation by resulting in unplanned and unpredictable outages. However, no disruption of power supply would occur under either action alternative. Energy supplies would also not be impacted by the related actions. Therefore, energy will not be addressed further in this EA.

Noise

The majority of construction activities will occur within the dam, which will contain the noise. There will be a slight increase in traffic noise and vibration as a result of supplies and material movement and worker transportation. Workers will be transported from the staging area in buses or vans, minimizing this disturbance. Material delivery will occur during normal business hours to avoid adverse impacts. The high ambient-noise levels and the mitigation measures discussed above would result in minimal noise impacts. The related actions will also have no noise impacts; therefore, noise will not be addressed further in this EA.

Wild and Scenic Rivers

There are no wild and scenic rivers in the Project area; therefore, wild and scenic rivers will not be addressed further in this EA.

Air Quality

There will a slight increase in exhaust emissions from construction vehicles and worker transport. Proper maintenance of equipment would prevent any increase in regulated air-quality parameters over established limits. Best Management Practices implemented as part of the Project would avoid measurable air quality impacts. Examples of appropriate best management practices would include dust suppression during construction, maintaining construction equipment exhaust emission controls according to manufacturer's instructions, and reducing emissions through carpooling of workers.

3.2 Hazardous or Toxic Wastes

3.2.1 Affected Environment

The GCPO is identified as a Large Quantity Generator of Hazardous/Dangerous Wastes in 2016 as a result of a lack of a disposal contract (DeWinkler 2017a). The facility's status will revert to Medium Quantity Generator in 2017 (DeWinkler 2017a). These wastes are generated as part of the facility's operations and maintenance (O&M) activities and include waste paints, solvents, used oils, lead, and asbestos. The lead and asbestos are accumulated as part of O&M activities associated with generation units.

As identified through sampling and ongoing efforts to dispose of polychlorinated biphenyl (PCB) electrical equipment, the RPH and LPH are generally considered to have a non-PCB operational status. Regardless of this consideration, the RPH and LPH continue to manage, for disposal, oil-filled capacitors as PCB items. Other oil-filled electrical equipment for which sampling cannot be performed or the manufacture date is not discoverable are also managed for disposal as PCB items.

The RPH and LPH have 18 generation units, identified as G1 through G18. All of these units were previously equipped with asbestos-containing brake pads. The brake pads were removed from all the units and all accessible areas were abated of brake dust (DeWinkler 2017b). Other areas are accessible only after the units are dismantled and may contain asbestos-contaminated dust. Gaskets to be removed and replaced are known to contain asbestos. Lead contamination is also evidenced in the dust, since many of the metal components were originally coated with lead-based paint. Because of these facts, all LPH and RPH units are managed with the presumption that they contain asbestos and lead dust.

The U.S. Environmental Protection Agency has expressed concerns regarding the potential for PCBs to be included in paints or caulks manufactured prior to 1979 (VERSAR 1979). As a result of these concerns, all painted surfaces scheduled for paint removal as part of any O&M activity would be sampled for both PCBs and lead.

Colville Tribal Law and Order Code, Chapter 4-13 Solid Waste, regulates solid and hazardous waste storage and disposal on CTCR lands. According to Grand Coulee Solid and Hazardous Waste program management, no solid or hazardous wastes are authorized for disposal on Tribal lands.

It has been found through inspection and air monitoring that the asbestos and lead dust is trapped in an oily film that covers virtually all internal surfaces of the units. Personal air monitoring results have not revealed any airborne concentrations of asbestos within an order of magnitude of the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) (greater than 0.1 fiber per cubic centimeter of air as an 8-hour time-weighted average). Personal air sampling for airborne concentrations of lead-contaminated dust also revealed concentrations well below the PEL for lead (0.050 milligrams per cubic meter). Health hazards associated with these contaminated dusts are perceived to be minimal (DeWinkler 2017c).

All workers receive annual lead awareness training and asbestos training/certification commensurate with their assigned duties. The Grand Coulee Powerplant Safety Office has established work planning steps to ensure that O&M activities are performed to ensure worker health and safety. Work supervisors are instructed to adhere to the Reclamation Safety and Health Standard, Section 4, to ensure that all known and foreseeable hazards are identified and mitigated prior to beginning work. Past O&M work activities have been preceded by a thorough cleaning of accessible surfaces (DeWinkler 2017c).

3.2.2 Environmental Consequences

Significance Criteria

Based on a qualitative analysis, a significant impact would occur if human health and the environment are predicted to be negatively impacted from management of hazardous wastes generated during the implementation of the Preferred Alternative or alternatives.

Alternative A – No Action Alternative

Reclamation would continue operating the RPH and LPH generating units. Current maintenance and production schedules would be adjusted as necessary to meet operational parameters and contractual obligations for power generation. Hazardous materials and waste would continue to be managed as they are at this present time. Used oils, lead- and asbestos-contaminated dusts, and potential PCB and lead-based paints would continue to be analyzed for content and removed and disposed of as determined by the O&M schedule.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a time

The internal parts of generating units within the RPH and LPH are coated with a thin film of oil that has encased dust particles potentially containing lead, asbestos, and PCBs. Potential exists for the exposure of GCPO employees and contractor employees working in the RPH and LPH during the dismantling and refurbishing of the generating units via inhalation and ingestion of contaminated dusts.

Regulated hazardous wastes would be generated as part of the Preferred Alternative in quantities greater than those generated during regular O&M activities. Modernization of the generator unit components would generate additional quantities of used oils, solvents, and detergent-based wastes that may contain lead, asbestos, and PCB-contaminated dust. Generation of sandblast media containing lead-based paint chips, waste paints, PCBs, and solvents may result from the removal of paint. Removed paint would be replaced with non-lead-based paints. The elevated amount of waste generation has the potential to increase worker exposure through inhalation, ingestion, and dermal absorption.

There will be a small increase in solid and hazardous wastes transportation as the increased waste generated as part of the Preferred Alternative is sent to recycling or disposal locations. Hazardous and dangerous waste management is tightly regulated through Federal Resource Conservation and Recovery Act and State of Washington Dangerous Waste Regulations. There are strict controls regulating its generation, transportation, and disposal or recycling, commonly referred to as cradle-to-grave management. Contingency and emergency response planning is required throughout all phases of the management process. In addition, the quantities potentially generated would not impact the available hazardous/dangerous waste disposal capacity in the region.

Contract specifications will protect contractors and GCPO workers from exposure to hazardous/dangerous waste through criteria that ensures worker health and safety and the proper treatment, temporary storage, and disposal of hazardous/dangerous wastes. Contract specifications require either a Negative Initial Exposure Assessment or the implementation of appropriate engineering controls for any contracted work area where the potential exists for airborne concentrations of lead or asbestos. OSHA PELs for worker exposure to hazardous substances are not to be exceeded.

Further safeguards are provided through Reclamation Manual Policy (ENV P01) and Directives and Standards (ENV 02-02; ENV 05-01) requiring that Reclamation must ensure

that hazardous/dangerous wastes generated on Reclamation property through its own or contracted activities are properly treated, stored, and disposed of in accordance with applicable environmental rules, regulations and standards, and that hazardous/dangerous wastes are recycled whenever possible.

Implementation of established worker safety standards and contract specifications will protect workers from potential exposure to hazardous/dangerous wastes. Release of hazardous/dangerous wastes to the environment would be prevented by implementation of waste management standard operation procedures, contract specifications, and Federal, state, and local environmental regulations. The Preferred Alternative represents a minimal increased potential for human or environmental exposure to hazardous/dangerous wastes. However, the measures discussed above will prevent exposure that would result in a significant impact.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a time

Environmental consequences would be the same as for Alternative B, but would extend over a longer period of time.

3.2.3 Mitigation

Alternative A – No Action

No mitigation is proposed.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a time

Established worker safety standards and contract specifications adequately address the potential worker exposure to generated hazardous/dangerous wastes. Waste management standard operation procedures, contract specifications, and Federal, state, and local environmental regulations ensure that a minimal potential exists for the release of hazardous/dangerous wastes to the environment. It is anticipated that the Preferred Alternative represents a minimally elevated potential for impact to human health or the environment, as contaminants may be airborne that wouldn't be without the Project. Apparent or alleged impacts to human health or the environment are currently being adequately addressed through administrative and engineering controls. The slightly elevated potential for impact to human health or the environment does not require additional controls or mitigation.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a time

Mitigation for Alternative C is the same as for Alternative B.

3.2.4 Cumulative Impacts

The TPP Overhaul has hazardous waste impacts similar to impacts associated with Alternatives B and C of this EA. However, those activities would occur in a separate and

isolated location and would not interact with activities associated with Alternatives B and C. The small amount of waste generated with the TPP Overhaul project will not prevent the hazardous waste recycling or disposal activities associated with this Project. Therefore, there will be no cumulative impacts as a result of implementation of Alternatives B or C.

3.3 Cultural Resources

This section addresses the affected environment and environmental consequences of the Project on cultural resources. Cultural resources include cultural landscapes, ethnographic resources, historic places, properties of traditional and cultural importance, artifacts and documents, buildings, structures, archaeological sites, districts, and objects. The Project is being reviewed following the Section 106 of the NHPA process, which encourages close coordination with NEPA and requires Federal agencies to take into account the effects of their actions on properties listed or eligible for listing on the NRHP.

Chapter 3.5 (Indian Sacred Sites) provides additional information about the existing conditions and potential environmental consequences to properties of traditional and cultural importance to Native American tribes. As part of the Section 106 process, Reclamation consulted with the Washington SHPO and Tribal Historic Preservation Officer (THPO) for the CTCR regarding the Project and archaeological and built environment areas of potential effects (APE). Appendix C contains copies of this correspondence and other Section 106 correspondence with the responsible historic preservation officers.

Regulations implementing Section 106 of NHPA, 36 CFR Part 800.8, encourage the coordination of two processes: (1) the review of possible impacts on the environment under NEPA, and (2) the assessment of effects of undertakings required under NHPA. Reclamation will provide opportunities to comment on the impacts the Project may have on cultural resources to the Washington SHPO, Native American tribes, and other interested parties.

Reclamation, as the lead agency responsible for compliance with Section 106 of the NHPA, is responsible for ensuring that the appropriate cultural resource studies have been conducted, including Class I literature reviews and Class III pedestrian inventories. These literature reviews and pedestrian inventories have been completed, sites have been recorded, and draft reports have been submitted to Reclamation. These surveys provided the location of cultural resource sites within the Project area.

Avoidance of cultural resources through project design remains the preferred method for mitigating impacts on cultural resources. Cultural resource impacts would be avoided, and best management practices would be implemented, including completion of Section 106 consultation, continuation of Native American consultation, and development of an avoidance strategy.

3.3.1 Affected Environment

Reclamation has identified historic properties that could be impacted by the Project. To be eligible for inclusion in the NRHP, a property must meet the requirements of at least one of the four primary NRHP criteria (National Park Service 1991).

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded or may be likely to yield, information important in prehistory or history.

Properties must retain enough integrity to demonstrate their significance under the criteria. The NRHP recognizes seven aspects of integrity: setting, feeling, association, location, materials, design, and workmanship. Even if a property meets the eligibility criteria, it must retain integrity to be eligible for listing in the NRHP. Properties generally must be at least 50 years of age to be eligible for the NRHP, unless they are proven to have exceptional importance (National Park Service 1991).

Archaeology

The chronology used here draws on a chronology developed for the Kettle Falls area, located about 100 miles upstream from Grand Coulee Dam (Berryman et al. 2011; Galm 1998). Pouley (2010b) has created a new chronology for the Kettle Falls site and surrounding areas based on re-analysis and interpretation of the data, and a comparison to other regional chronologies (Chance et al. 1986). Terminology for his chronology is based on major figures in local oral history and includes data from radiocarbon dates from new and curated samples. Pouley's (2010a) revised Kettle Falls Chronology Periods include Coyote (8,000 to 4,800 B.P.), Salmon (4,800 to 3,500 B.P.), Eagle (3,500 to 2,200 B.P.), and Turtle (2,200 to 200 B.P.). As with other culture history models, Pouley argues for a gradual shift on the Plateau from foraging, to optimal foraging, to collector-based societies.

The following cultural chronology is also synthesized from the investigation for the John W. Keys III Pump-Generating Plant Modernization Project at Grand Coulee Dam (Berryman et al. 2011), and developed from the investigations for Chief Joseph Dam (also known as Lake Rufus Woods) (Ames et al. 1998; Andrefsky 2004; Campbell 1985; CTCR 2006). Chief Joseph Dam lies approximately 20 miles downstream on the Columbia River from the Grand Coulee Dam area. The following cultural chronology incorporates the tripartite period divisions advocated by Galm (1998) and other scholars: Early Period (11,250 to 6,000/4,000 B.P.), Middle Period (4,000 B.P. to 2,500/2,000 B.P.), and Late Period (2,500/2,000 B.P. to 500 B.P.).

Paleoindian Period (circa 12,000 B.P. to 7,000 B.P.)

Clovis projectile points have been found approximately 70 miles southwest of the Project area in association with volcanic ash dated to 11,250 B.P. Fluted and large-stemmed Paleoindian projectile points have been found throughout north-central Washington, with finds concentrated along permanent lakes and rivers. Sites in the region have produced little evidence of extensive exploitation of Pleistocene megafauna, as seen on the northwest Plains, with the population apparently following a more generalized subsistence strategy focusing on root crops and salmon (Galm 1998).

Kartar Phase (7,000 B.P. to 4,000 B.P.)

The Kartar phase is comparable to Pouley's (2010a) Coyote Period (8,000 to 4,800 B.P.) and spans the Early Archaic and part of the Middle Archaic or Middle periods. During this phase, there was a greater variety of ground stone tools than the preceding Paleoindian period, including mortars and edge-ground cobbles used for food processing (Pouley 2010a). Small groups of three to four semi-subterranean pithouses were common in the later part of the phase. Sites associated with the Kartar phase are concentrated on tributaries of the Columbia River (Berryman et al. 2011).

Hudnut Phase (4,000 B.P. to 2,000 B.P.)

The Hudnut phase occupies the later part of the Middle Archaic or Middle period. The material culture of the Hudnut phase generally resembles that seen in the preceding Kartar phase, with a wide variety of ground-stone tool forms; however, projectile points shifted to smaller side- and corner-notched dart points. Sites along the Columbia and its major tributaries are generally larger than those found in other locations (Berryman et al. 2011). The Eagle Period (3,500 B.P. to 2,200 B.P.) also overlaps with the Hudnut Phase and includes the adoption of a collector strategy, evidenced by a further increase in the use of pithouse and storage features, as well as a 60 percent increase in salmon in the archaeological record (Pouley 2010a).

Coyote Creek Phase (2,000 to 250 B.P.)

The Coyote Creek phase spans the entirety of the Late Period and is comparable to Pouley's (2010a) Turtle Period (2,200-200 B.P.) Most of the elements of material culture observed by ethnographers is present by the start of this phase. Although no sites of this phase have been identified in the Project area, it is possible that some of the sites with talus pits, pictographs, and other stone features found in the general Grand Coulee Dam area may date to this period (Berryman et al. 2011).

Euro-American Period (250 B.P. to Present)

Although European exploration did not enter the Grand Coulee Dam area until the early 19th century, word of the Russian and Spanish exploratory expeditions along the Pacific Coast spread to the area in the 1600s, with trade goods following shortly thereafter. Horses appear to have been introduced to the area in the 1740s and had a significant effect on tribal organization. The first Christian missionaries arrived in areas occupied by local tribes as early as the late 1830s (Bouchard and Kennedy 1984; Ray 1977). The Indian Appropriations

Act of August 19, 1890, opened any unassigned lands to white settlers for settlement. Shortly afterwards, the north half of the Colville Reservation was ceded to the United States by an act of Congress in 1892 (27 Stat. 62). This resulted in the opening of 1.5 million acres of the northern half of the Colville Reservation—which at the time extended all the way north to the Canadian border—to non-Indian settlement in 1892 (Hess 2010). In 1898, reservation lands were opened to miners and prospectors, resulting in destructive environmental effects that can still be seen along the Columbia River (Bouchard and Kennedy 1984). The CTCR formally united 12 Indian tribes with diverse political traditions and distinct linguistic roots with ties to the lands of the Colville Reservation (Ray 1974; 1977). This confederation comprises the Salishan-speaking Sanpoil (or Snpui·´lux), Nespelem (Snspi·´ləm), Southern Okanagan (or Isankuafli), Colville (or Shwoyelpi or Skoyelpi), Lakes (or Sinixt), Columbia (or Moses-Columbian, or Sinkaiuse), Methow, Chelan, Entiat, and Wentachi (or P'squosa) tribes, the Nez Perce speaking Wallowa-Imnaha band, and Sahaptin-speaking Palus (or Palouse) tribe. Except for the Wallowa Nez Perce, whose ancestral lands were in northeastern Oregon, and the Palus, who migrated from southeastern Washington, all of the Confederated Tribes have had a "long, continuous, and stable occupation" (Ray 1977) of the Columbia River Basin area spanning anywhere from 10,000 (Ray 1977) to 14,000 years or more (Hess 2010).

By 1900, up to 75 percent of the lowlands in the valley bottom had been planted in orchards, with small communities like Peach, Plum, Daisy, Gifford, Kettle Falls, and Marcus forming to supply local farmers (Roulette et al. 2001). The desire to expand farming beyond the fertile valley onto the adjacent arid uplands created a push for large irrigation projects starting in the late 19th. These demands eventually helped spur creation of Grand Coulee Dam (Berryman et al. 2011).

Archaeological Resources within the Project Area

Although most of the work for the proposed upgrade is occurring inside the generating units, staging and laydown will be required to facilitate construction. The affected area for the proposed staging and laydown encompasses nine staging areas, as shown in Figure 2. These locations would be used temporarily for storage supplies and equipment during construction. Use of these areas would have no impact on built environment resources and have been evaluated for archaeological effects.

Much of the Project area is designated as very high risk/probability for archaeological materials by the Washington Statewide Predictive Model, with a recommendation to survey; however, the resolution of the model does not account for many site-specific, on-the-ground variables.

A records search for archaeological resources within 1 mile of the archaeological APE identified 15 archaeological sites. The only cultural resource or historic property identified within the archaeological APE was the Grand Coulee Dam historic district. Of the 15 resources within the study area, nine are pre-contact sites and six are historic sites. There are two NRHP-eligible historic properties within the study areas: 45GR146, a pre-contact site,

and 45GR662, a historic site. The other 13 archaeological sites within 1 mile of the APE remain unevaluated for NRHP eligibility at this time.

Investigation of proposed staging areas, including archaeological survey, was conducted as part of compliance with NHPA section 106 (Mcfarland and Ferry 2016). Pedestrian survey confirmed extensive ground disturbance from construction and following demolition and removal of materials. Open areas that at first appeared undeveloped were in fact heavily disturbed. No pre-contact resources were identified during investigation, but non-contributing historic debris and post-demolition fragmentary infrastructure associated with the dam and construction of the TPP were noted.

Traditional Cultural Properties

According to ethnographic research and additional information provided by the CTCR THPO, there are numerous named landforms with Salish place-names in and near the Grand Coulee area. While the majority of traditional places are present outside Grand Coulee Dam, one named place overlaps with the Project area. The CTCR THPO has, in correspondence for the Project, indicated that "Grand Coulee Dam, and therefore, in a sense, both of the powerhouses under discussion, are located within skx̌ʷ'əcín, a place associated with a trail passing by the mouth of Grand Coulee and an adjacent camp and fishing area. Recently, Reclamation partially mitigated impacts to skx̌ʷ'əcín by establishing a tribal fishing site below Grand Coulee Dam. For cultural resources, we consider the fishery created below the Grand Coulee Dam as adequate treatment for this specific undertaking for the traditional site" (Moura 2016). In the same correspondence, the CTCR THPO indicated the CTCR had no traditional concerns with areas previously disturbed by dam construction.

The Grand Coulee Dam project area has undergone extensive construction-related disturbance over the past 70-plus years (see the Cultural Resources section above). As such, the physical integrity of any TCPs or other properties of traditional religious and cultural importance to tribes in this area would have been severely compromised by the transformation of the landform into Grand Coulee Dam. Additionally, as a part of its security procedures, Reclamation has been obligated to limit access to lands within the Project area over the past decades. One recent exception to this statement is the separate (but in process) action to upgrade security measures and allow expanded access to the fishery (associated with the named place skx̌ʷ'əcín) near the north parapet wall of the TPP on the reservation side (right side) of the river below the dam.

A literature review of previous TCP studies was completed as part of the Section 106 investigations. There are five previously documented TCPs and named places within approximately 2 miles of the proposed APE. Some of these are named places, and some are archaeological sites with cultural relevance to the area tribes. The most visible of these locations, from the southernmost location of the APE, is the landform "Set in between" (for more information, see John W. Keys III Pump-Generating Plant Modernization Project, Grand Coulee Dam: Finding of Effect on Traditional Cultural Properties [Moreno and Curti 2011]). Although the Project, including staging locations, is located within the viewshed of

several of these places, the Project occupies lands previously heavily disturbed by Grand Coulee Dam construction activities. Because of the industrial use as part of the larger Grand Coulee Dam complex, additional effects to TCPs are not anticipated as part of the Project. At this point, there are no plans to add equipment to the exterior of the industrial complex, and use of the potential staging areas does not currently involve plans for any permanent visible construction.

Buildings and Structures

In consultation with SHPO and THPO, Reclamation identified the APE for historic-era buildings and structures to include the LPH, RPH, and Dam. The Project will require the replacement of equipment associated with Grand Coulee Dam, which is the largest hydroelectric power producer in the U.S. and is one of the largest concrete structures in the world (Reclamation 2015). In 2006, SHPO concurred with the finding that the Grand Coulee "dam, power plants, pumping plants, industrial area [southwest of dam] and associated facilities" are part of the historic complex eligible for listing in the NRHP (Reclamation 2006). Reclamation is currently working to delineate the boundaries of the historic district and provide supporting historical significance documentation in the form of a NRHP nomination.

The Grand Coulee Dam complex is eligible for the NRHP at the national level as a historic district that meets NRHP criteria A and C. It is eligible under NRHP Criterion A for its expansion of regional power production, flood control and irrigation, and reflected the "aspirations, capabilities and priorities" of the United States beginning in the 1940s (Roise 2015). The Grand Coulee Dam complex is also eligible as a historic district under NRHP Criterion C for its method of construction. The dam is one of the largest concrete structures in the world and reflects Reclamation's move from creating dams for agricultural and flood control purposes to multipurpose projects that included hydroelectric power production. Although equipment upgrades have occurred to keep pace with changing technology, the complex has retained integrity. Constructed during a period of rising standardization, the mechanical systems have not been identified as particularly innovative. Overall, the concrete dam and powerplant have retained their original organization, materials, and finishes. Located on the downstream (north) side of the dam, the LPH and RPH flank the spillway and are mirror images of one another.

The Project impacts 11 different types of elements associated with the historic dam and powerhouses. The elements of the NRHP-eligible Grand Coulee Dam Historic District that would be replaced or repaired are summarized in Table 2.

Table 2. Grand Coulee Dam Historic District elements located within the APE of the G1-G18 Modernization Project

No.	Element	Location	Description
1	Windings and Cores (G1-G3, G6, G8-18)	LPH/RPH	Surrounds generator rotor, which generates electricity by moving to induce current in the stator's copper windings.

No.	Element	Location	Description
2	Governors (G1-G18)	LPH/RHP	Mechanical regulating equipment controlling the flow of water through the turbines.
3	Floor-mounted Exciters (G1-G6)	LPH	Motor-generated exciter on floor next to generating unit, which provides necessary direct current needed to energize the generator's magnetic field.
4	Top-mounted Exciters (G7-G18)	LPH/RPH	Exciter located on top of generating unit to provide necessary direct current needed to energize the generator's magnetic field.
5	Bridge Cranes	LPH/RPH	Located in powerhouse generator halls above units as a means to hoist heavy equipment.
6	Gantry Cranes	LPH/RPH	Two 150-ton cranes each on top of LPH and RPH used for lifting gates; two 14-ton Cyclops Cranes on concrete ledge below powerhouse windows used to lift draft tube gates.
7	Penstocks (G1-G18)	LPH/RPH	Enclosed pipes carrying water from upstream side of dam into the turbines.
8	Station Service Windings and Cores	LPH	Surrounds generator rotor, which generates electricity by moving to induce current in the stator's windings (location not illustrated).
9	Iso-phase Bus	LPH/RPH	Conduit used for carrying very large currents between generator and transformer.
10	Relays (G1-G18)	LPH/RPH	Device that detects the fault and initiates the operation of the circuit breaker to isolate the defective element from the rest of the system.

3.3.2 Environmental Consequences

Significance Criteria

Historic properties were analyzed under both NEPA and NHPA for how the Project might affect them. NEPA analysis refers to project impacts, and the NHPA analysis refers to project effects.

Under NEPA, direct impacts to historic properties are those that are caused by the action and occur at the same time and place. They are not limited to physical impacts to the property; they can also include impacts to the setting. The context and intensity of impacts must be considered. The intensity of an impact refers to the degree to which the action may impact or cause loss or destruction to significant cultural resources. This intensity may be categorized as Minor, Not Significant, or Significant. Indirect impacts are caused by the action and are later in time or farther removed in distance but still are reasonably foreseeable, such as changes in land use patterns and related effects on air quality. Cumulative impacts result from the Preferred Alternative's incremental impact when added to those of other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Direct impacts to archaeological resources may result from ground-disturbing activities such as construction, staging, or laydown associated with upgrading the generating units. Although changes in reservoir level during repair of the generating units could constitute a

direct effect on reservoir shoreline sites, this fluctuation will not be in excess of what occurs during normal operation of the dam, and so cannot be considered an impact separate from routine operating procedures.

Indirect impacts may include disturbance, destruction, and/or increased damage to pre-contact and historic archaeological sites because of increased public use or activities in the resource area.

The ACHP regulations implementing Section 106 of the NHPA create a process through which Criteria of Adverse Effect are applied. These criteria are used to determine whether the Project could change the characteristics that qualify a property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. There are three findings for effects on historic properties: No Historic Properties Affected, No Adverse Effect, or Adverse Effect. Adverse effects include, but are not limited to, the following: Demolition or alteration of the property; introduction of visual, audible, or atmospheric elements that are out of character with the setting of the historic property; and physical encroachment upon an archaeological site. NEPA requires mitigation for significant impacts and may also include mitigation as integral components of the design to avoid or lessen potentially significant effects. In the spirit of both NEPA and Section 106, the alternatives were designed to avoid or minimize impacts on historic properties and other sensitive cultural resources.

Alternative A – No Action

Archaeology

Alternative A, the No Action alternative, would have no adverse effect and no significant impact to NRHP-eligible archaeological resources.

TCPs

Alternative A, the No Action alternative, would have no adverse effect and no significant impact to TCPs.

Buildings and Structures

Alternative A, as the No Action alternative, would have no adverse effect and no significant impact to historic properties. If no action occurred, Reclamation would find it progressively more difficult and expensive to maintain the equipment identified for replacement under Alternatives B and C.

No historic properties would be affected by Alternative A, No Action.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a time

Archaeology

Alternative B, completing work on both units simultaneously, would have no effect and no impact to NRHP-eligible archaeological resources. No NRHP-eligible archaeological

resources were identified within any of the proposed staging and laydown areas that would be used to support Alternative B.

TCPs

Alternative B, completing work on both units simultaneously, would have no effect and no impact to TCPs. No TCPs were identified within any of the proposed staging and laydown areas that would be used to support Alternative B.

Buildings and Structures

The Project would have an adverse effect on the NRHP-eligible Grand Coulee Dam historic district as a result of the replacement of the G1-G6 floor-mounted exciters, five bridge cranes, and four gantry cranes. When an undertaking is found to have an adverse effect, Section 106 requires consultation with the SHPO and other interested parties regarding appropriate avoidance, minimization, or mitigation measures. The product of consultation would be a Memorandum of Agreement, per 36 CFR 800.6(c), among Reclamation, SHPO, and THPO. Under NEPA, these adverse effects would be identified as minor impacts. No adverse effects or significant impacts to historic properties would occur from generator winding and core replacements, G1-G18 governor replacements, G7-G18 top-mounted exciter replacements, or recoating of the penstocks. Table 3 identifies the proposed changes, lists the location of proposed modifications, describes if the change will be visible or not, and lists the change's effect to historic properties under Section 106 of NHPA.

Table 3. G1-G18 Modernization Project Alternative B NHPA Finding of Effects under NHPA

Action No.	Proposed Change	Location	Visible (location described) or Not Visible	Effect
1	Windings, cores, and spare replacement	LPH/RPH	Not visible	No adverse effect
2	G1-G18 governor replacement	LPH/RPH	Visible (in cabinet within governor gallery)	No adverse effect
3	G1-G6 floor-mounted exciter replacement	LPH	Visible (from within the generator hall)	Adverse effect
4	G7-G18 top-mounted exciter replacement	LPH/RPH	Not visible	No adverse effect
5	LPH (2), RPH (2), and Station Service (1) bridge crane replacements	LPH/RPH	Visible (from within the generator halls)	Adverse effect
6	Gantry (4) crane replacements[a]	LPH/RPH	Visible (from exterior of dam and powerhouses)	Adverse effect
7	G1-G18 penstock recoating	LPH/RPH	Not visible	No adverse effect
8	Station service generator winding and modernization	LPH	Not visible	No adverse effect

Action No.	Proposed Change	Location	Visible (location described) or Not Visible	Effect
9	G1-G18 iso-phase bus evaluation	LPH/RPH	Visible (from within transformer bus gallery)	No adverse effect
10	G1-G18 relay replacement	LPH/RPH	Visible (through glass door of cabinet in governor gallery)	No Adverse Effect

[a] If Alternative B results in updating rather than replacing cranes, this could result in a no adverse effect.

Reclamation identified that no adverse effects would occur from the replacement or repair of standard equipment being modified for the continued operation of Grand Coulee Dam. Furthermore, many of the changes determined to have no adverse effect on historic properties are not easily visible as they occur in remote equipment galleries or are buried or underwater when in use, such as the penstocks.

G1-G6 Floor-mounted Exciter Replacement

The existing floor-mounted exciters associated with G1-G6 will be replaced with modern floor-mounted exciters. The new excitation equipment will have a slightly larger footprint and be oriented within the same vicinity of the removed exciters. The exciter controls will be located in close proximity to the exciters and generating unit. This is a change from the existing layout, which consists of the exciter cabinets in a separate hall. The floor-mounted exciters are a visible element from within the LPH generator hall. Though public visitation is restricted today, the generator halls were designed as public spaces where tourists could overlook the power generation facilities. Removal of the original exciters and addition of exciter control cabinets on the generator hall floor would alter the original organization of equipment, diminishing the integrity of design, materials, workmanship, and feeling within the LPH.

LPH (Two), RPH (Two), and Station Service (One) Bridge Crane Replacements

The pairs of bridge cranes in the LPH and RPH generator halls, as well as the bridge crane in the Station Service generator hall, will be replaced or refurbished. The five bridge cranes will be replaced or refurbished with custom-built components. The bridge cranes are a character-defining feature of the generator halls visible from all areas within the halls. The onsite work will be conducted in the generator halls, which includes terrazzo floors. The LPH has particularly distinctive floors illustrating the inner workings of the turbine and generator in different shades of terrazzo with metal trim. Construction of the cranes and the storage and movement of heavy equipment in the generator halls could damage the floors, which are character-defining features of the powerhouses. The replacement of the bridge cranes would be a visible change to the generator halls resulting in an adverse effect as a result of loss of materials, workmanship, and feeling.

If Reclamation chooses to rehabilitate the bridge cranes rather than replaces them, this action may avoid adverse effects.

Gantry Crane Replacements (Four)

The exterior of the LPH and RPH includes four gantry cranes that are character-defining features of the powerhouses. On top of the dam, the moveable 150-ton gantry cranes sit on a pair of 170-pound rails separated by 27 feet, and the downstream side of the LPH and RPH includes two smaller Cyclops gantry cranes running on rails extending across the ledge below the powerhouse windows. The massive cranes on top of the dam raise and lower the gates that control the water flow into the G1-G18 penstocks, and the smaller cranes move the bulkhead gates. The replacement of the cranes with modern equipment would result in the loss of character-defining exterior elements of the dam and powerhouses. The replacement of the gantry cranes would be an adverse effect to historic properties. It is possible that Reclamation would modernize the controls and electrical equipment rather than replace the cranes. This would include modifications to a variety of components:

- Hoist, trolley, and bridge drive motors
- Bridge electrification busses/conductors/collectors
- Trolley electrification (replace with festooned cabling)
- Control panels (replace with variable-frequency drive modules)

If Reclamation chooses to rehabilitate the gantry cranes rather than replace them, this action may avoid adverse effects.

Alternative C– Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a time

Archaeology

Alternative C, with work being conducted on one unit at a time, would have no effect and no impact to NRHP-eligible archaeological resources. No NRHP eligible archaeological resources were identified within any of the proposed staging and laydown areas that would be used to support work under Alternative C.

TCPs

Alternative C, with work being conducted on one unit at a time, would have no effect and no impact to TCPs. No TCPs were identified within any of the proposed staging and laydown areas that would be used to support work under Alternative C.

Buildings and Structures

The effects of impacts to historic properties under Alternative C would be the same as Alternative B impacts, which are summarized in Table 3.

3.3.3 Mitigation

Alternative A – No Action

If the No Action Alternative is implemented, no mitigation would be necessary. To complete consultation under Section 106 of the NHPA, Reclamation would need to notify the THPO, Washington Department of Archeological and Historic Preservation (DAHP), and the ACHP of Reclamation's decision not to proceed with the Project.

Alternatives B (Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a time) and C (Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a time)

Reclamation has determined that Alternatives B and C of the Project would have adverse effects on historic properties. To resolve the adverse effects, Reclamation, as the lead Federal agency under Section 106 of the NHPA, consulted with the Washington SHPO and CTCR THPO. As required, Reclamation notified the ACHP of the adverse effects and invited them to participate in this resolution process. The ACHP declined the invitation to participate as a consulting party.

To resolve the adverse effects, a Programmatic Agreement (PA) was prepared in consultation with the Washington SHPO and staff, and the CTCR THPO to stipulate measures to minimize and mitigate the effects to the NRHP-eligible Grand Coulee Dam Historic District and to identify categories of undertakings that may be exempted from further review under the appropriate provisions of 36 CFR 800. Appendix D includes a copy of the PA. Resolution of the adverse effect through execution of the PA would result in no significant or minor impact for NEPA.

3.3.4 Cumulative Impacts

Alternative A – No Action

There would be no impacts to cultural resources under the No Action alternative, so there would be no contribution to cumulative effects to cultural resources under Alternative A.

Alternative B (Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a time) and C (Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a time)

Because of the adverse effect resulting from replacement of the six G1-G6 floor-mounted exciters, five bridge cranes and four gantry cranes, the build alternatives would contribute to cumulative impacts to cultural resources. Reclamation is completing two other large overhaul projects within the Grand Coulee Dam Historic District: the TPP Overhaul (FONSI issued April 2010) and the John W. Keys III Pump-Generating Plant Modernization Project (FONSI issued March 2012). Both of these projects were reviewed under Section 106 of the NHPA, which culminated in agreements to mitigate for adverse effects to historic properties. The work being completed is primarily replacement of equipment, rather than structural modifications that alter the engineering layout of the facility. Heavy use necessitates the eventual replacement of hydroelectric equipment; therefore, when viewed collectively, the multiple overhaul projects would not have a significant cumulative impact.

There will likely be more maintenance and repair required to this property that could contribute to cumulative impacts; the impacts from the repair and maintenance of the property do not constitute a significant cumulative impact. There would be a beneficial impact to the Grand Coulee Dam Historic District because the property will remain in place and the repairs as part of the Project will ensure its continuity of use.

3.4 Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," dated February 11, 1994, requires agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minorities and low-income populations and communities, as well as the equity of the distribution of the benefits and risks. Environmental justice addresses the fair treatment of people of all races and incomes with respect to actions affecting the environment. Fair treatment implies that no group should bear a disproportionate share of negative impacts.

3.4.1 Affected Environment

The area around Grand Coulee Dam and its reservoir, Lake Roosevelt, is located in Douglas, Ferry, Grant, Lincoln, and Okanogan Counties. These counties were selected as the local study area. Table 4 provides the numbers and percentages of population in 2009 for seven racial categories (White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races), the total minority population, and the Hispanic or Latino population (a minority ethnic group) for each county, the combined five-county study area, and the state of Washington (U.S. Census Bureau 2010a).

Table 4. Race and Ethnicity

Category	Douglas County		Ferry County		Grant County		Study Area Lincoln County		Okanogan County		Total Study Area		State of Washington	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Total Population	37,565	—	7,520	—	88,098	—	10,248	—	40,552	—	183,983	—	6,465,755	—
White	35,446	94.4	5,902	78.5	83,034	94.3	9,735	95.0	34,378	84.8	168,495	91.6	5,201,398	80.4
Black or African American	382	1.0	17	0.2	1,147	1.3	28	0.3	280	0.7	1,854	1.0	220,417	3.4
American Indian and Alaska Native	713	1.9	1,319	17.5	1,482	1.7	262	2.6	4,612	11.4	8,388	4.6	91,437	1.4
Asian	371	1.0	23	0.3	1,079	1.2	30	0.3	313	0.8	1,816	1.0	424,531	6.6
Native Hawaiian and Other Pacific Islander	72	0.2	7	0.1	98	0.1	7	0.1	36	0.1	220	0.1	28,884	0.4
Population of two or more races	581	1.5	252	3.4	1,258	1.4	186	1.8	933	2.3	3,210	1.7	244,250	3.8
Total Racial Minority Population	2,119	5.6	1,618	21.5	5,064	5.7	513	5.0	6,174	15.2	15,488	8.4	1,009,519	15.6
Not Hispanic or Latino	27,507	73.2	7,257	96.5	55,694	63.2	9,946	97.1	33.494	82.6	133,898	72.8	5,841,930	90.4
Hispanic or Latino	10,058	26.8	263	3.5	32,404	36.8	302	2.9	7,058	17.4	50,085	27.2	623,825	9.8

Source: U.S. Census Bureau 2010a

Table 5. Income, Poverty, Unemployment, and Housing

Category	Douglas County	Ferry County	Study Area Grant County	Lincoln County	Okanogan County	State of Washington
Income						
Median Family Income	$55,363	$43,529	$48,907	$50,899	$48,159	$68,457
Per Capita Income	$22,522	$26,283	$19,205	$24,127	$19,367	$29,320
Percent Below Poverty Level						
Families	12.0	12.0	14.4	8.1	14.2	7.9
Individuals	14.3	19.1	19.0	12.6	19.6	11.8
Percent Unemployed	7.0	15.0	10.2	4.5	8.7	7.0
Percent of Housing						
1.01 or More Occupants per Room	5.6	1.5	7.8	2.6	2.9	2.4
Lacking Complete Plumbing Facilities	0.4	2.3	0.1	1.2	0.8	0.5

Source: U.S. Census Bureau 2010b

The proportion of American Indians within the local study area is more than three times greater than the state of Washington, largely as a result of the presence of the CTCR within the study area and the nearby STOI Reservation. Conversely, the proportion of persons who are Asian or Black or African American is substantially less than for the State of Washington. While the Total Racial Minority Population of the five-county study area, at 8.4 percent, also is less than the state's percentage of 15.6, the Hispanic or Latino representation within the study area is nearly three times greater than the state, at 27.2 percent and 9.6 percent, respectively.

Low-income populations are identified by several socioeconomic characteristics. As categorized by the 2000 Census, specific characteristics include income (median family and per capita), percentage of the population below poverty (families and individuals), unemployment rates, and substandard housing. Table 5 provides income, poverty, unemployment, and housing information for each county and the state for the year 2000 (U.S. Census Bureau 2010b).

Median family income and per capita income for the five counties are less than those in the state as a whole. Compared to the State of Washington, the study area has greater percentages of families and individuals below the poverty level.

Other demographic data, such as unemployment and substandard housing, also serve as indicators of low income in relation to environmental justice. In 2009, unemployment in three of the five counties was greater than the state's 7.0 percent unemployment rate. Douglas County's unemployment rate matched the state's rate at 7.0 percent, while Lincoln County's unemployment rate was a relatively low 4.5 percent.

Substandard housing units are typically identified as being overcrowded and/or lacking complete plumbing facilities. The percentage of occupied housing units with 1.01 or more occupants per room was greater in four of the five study area counties than the 2.4 percent for the state; Ferry County's 1.5 percent was notably less than the state percentage. The percentage of housing units lacking complete plumbing facilities in the study area was less than the state percentage of 0.5 percent in both Douglas and Grant counties.

3.4.2 Environmental Consequences

Significance Criteria

Environmental justice analysis evaluates the effects of potential adverse environmental impacts on natural resources (and associated human health impacts) and socioeconomic impacts to identify and describe disproportionate adverse effects to minority and/or low-income populations. Environmental justice impacts would be considered significant if the Project results in disproportionate adverse impacts to minority and/or low-income populations.

Alternative A – No Action Alternative

No adverse natural resource or socioeconomic impacts adversely affecting minority and low-income populations have been identified for the No Action Alternative; therefore, there are no environmental justice impacts.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time

Alternative B would likely result in new jobs at any one time during the time period necessary for modernization. Some portion of these jobs likely would be filled by persons coming into the study area from outside, although the number cannot be reliably estimated. While we cannot say for certain, we assume that some of the new persons coming into the area for the Project may rent property, hotel rooms, camp, or stay in nearby RV parks for extended periods of time or for work days.

In terms of available housing in the area, research conducted for previous construction-related projects at Grand Coulee confirmed anecdotal information that there are many factors at the local and regional levels that influence the demand, supply, and cost of rental and owner-occupied housing. The existing demand for rental housing in the Project area is generally considered to be high relative to the currently available supply, and Alternative B would be expected to contribute to that demand; however, it is not reasonably foreseeable that this would result in adverse impacts that could disproportionately affect minority or low-income populations.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a Time

Environmental consequences for Alternative C would be the same as Alternative B.

3.4.3 Mitigation

None identified for any of the alternatives.

3.4.4 Cumulative Impacts

The Project and other attractants to persons moving into or remaining within the Project vicinity and study area would contribute to the demand for housing and could influence upward pressure on the cost of housing to some small degree; however, this is not expected to create an environmental justice impact when considered with the other related actions.

3.5 Indian Sacred Sites

Executive Order 13007, signed by President Clinton on May 24, 1996, defines a sacred site as:

> *Any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred*

by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site [E.O. 13007, Section 1 (b) (iii)].

3.5.1 Affected Environment

The Grand Coulee Dam sits within the traditional territory of the Nespelem Tribe. The Nespelem are one of 12 Federally recognized tribes who are incorporated as the CTCR. The Sanpoil and the Moses-Columbia, also incorporated as part of the CTCR, occupied adjacent traditional territories to the east and south of the Project.

The CTCR have not specifically identified any sacred sites within the immediate vicinity of the proposed project area. A number of locations with traditional Indian place names and traditional cultural value are present in the general area of Grand Coulee Dam, but the CTCR have not specifically identified these sites as having established religious significance or ceremonial use.

Members of the CTCR often generally recognize that many aspects of the natural environment should be considered sacred, including water, land, air, and various plant and animal species. In their Cultural Resources Management Plan (CTCR 2006), the CTCR group sacred sites with traditional cultural properties and properties of traditional religious and cultural importance to tribes.

Local landforms with Salish place-names are associated with stories and legends that remain important to the cultural continuity of the CTCR and other regional tribes. In addition to living near the Columbia River and fishing its waters, tribal members traditionally exploited root crops in the wetlands and traversed the river bottom and the rocky slopes above the river channel for a variety of other resources. Stacked rock cairns and rock art panels present on rocky slopes surrounding the Grand Coulee Dam denote places where tribal members have sought, and still seek, spiritual power (George 2003).

Tribal Consultation and Coordination

The CTCR and STOI were contacted in preparation of this EA. The Chairs of the STOI and the CTCR, as well as appropriate Bureau of Indian Affairs officials, were sent scoping letters (Appendix A) to inform the tribes and solicit comments relative to ITAs and other issues. CTCR and STOI both replied with formal public scoping comment letters (Appendix A).

3.5.2 Environmental Consequences

Significance Criteria

Any alternative adversely affecting Indian sacred sites would be considered a significant impact.

No Action Alternative

There are no impacts to Indian sacred sites from the No Action Alternative.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time

Based upon the review of existing information and consultations with the CTCR THPO, implementation of Alternative B would not result in direct or indirect impacts to sacred sites.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a Time

Based upon the review of existing information and consultations with the CTCR THPO, implementation of Alternative C would not result in direct or indirect impacts to sacred sites.

3.5.3 Mitigation

There is no mitigation required for implementation of any alternative.

3.5.4 Cumulative Impacts

There are no impacts from implementation of the action alternatives. Therefore, there are no cumulative impacts when considered with the other related actions.

3.6 Indian Trust Assets

ITAs are legal interests in property held in trust by the U.S. for Federally recognized Indian Tribes or individual Indians. ITAs may include land, minerals, Federally reserved hunting and fishing rights, Federally reserved water rights, and instream flows associated with trust land. The General Allotment Act of 1887 allotted land to some Tribes, while others were allotted land through treaty or specific legislation until 1934, when further allotments were prohibited. These allotments are considered ITAs.

3.6.1 Affected Environment

Federally recognized Indian Tribes with trust land are beneficiaries of the Indian trust relationship, with the U.S. Government acting as trustee. No one can sell, lease, or otherwise encumber ITAs without approval of the U.S. Government. While the majority of ITAs are located on-reservation, ITAs can also occur outside reservation boundaries. Consequently, two Tribes have a historical presence or cultural interest in the larger project area. These include the CTCR and the STOI.

As stated in the 1994 memorandum, *Government-to-Government Relations with Native American Tribal Governments*, Reclamation is responsible for the assessment of project effects on Tribal trust resources and Federally recognized Tribal Governments. Reclamation is tasked to actively engage and consult Federally recognized Tribal Governments on a government-to-government level when its actions affect ITAs.

The Interior Manual Part 512.2 delegates the responsibility for ensuring protection of ITAs to the heads of bureaus and offices (Interior 1995). The Interior is required to “protect and preserve ITAs from loss, damage, unlawful alienation, waste, and depletion” (Interior 2000). Reclamation is responsible for determining if a proposed project has a potential to affect ITAs.

3.6.2 Environmental Consequences

Significance Criteria

Any alternative adversely affecting ITAs would be considered a significant impact.

No Action Alternative

There are no impacts to ITAs from the No Action Alternative.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time

No ITAs have been identified in the Project area. Alternative B would not have direct or indirect impacts to ITAs since Project impacts are limited to Grand Coulee Dam and surrounding Project areas. Laydown yards located near the dam are also located within the existing footprint of dam facilities.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a Time

No ITAs have been identified in the Project area. Alternative C would not have direct or indirect impacts to ITAs since Project impacts are limited to Grand Coulee Dam and surrounding project areas. Laydown yards located near the dam are also located within the existing footprint of dam facilities.

3.6.3 Mitigation

There is no mitigation required for any alternative.

3.6.4 Cumulative Impacts

There are no impacts from implementation of the action alternatives. Therefore, there are no cumulative impacts when considered with the other related actions.

3.7 Transportation

3.7.1 Affected Environment

Access

Grand Coulee Dam is located on the Columbia River north of the City of Grand Coulee and south of the Town of Coulee Dam in Grant and Okanogan Counties in north-central Washington State, approximately 90 miles west of Spokane and 230 miles east of Seattle. As shown in Figure 3, access to and from the Grand Coulee Dam area is provided by Interstate Highway 90, U.S. Highway 2, and State Routes 17, 21,174, 283/28, and 155. Direct access to Grand Coulee Dam and the powerhouses is provided by Reclamation roads via SR 155.

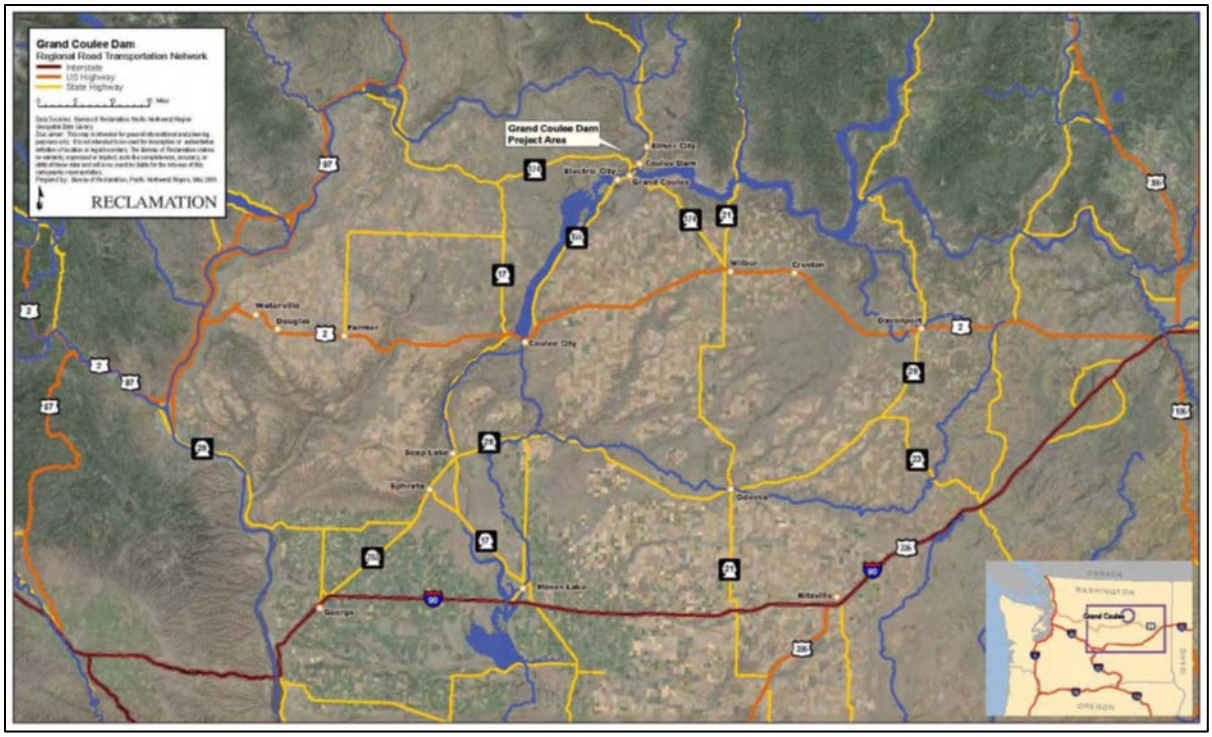


Figure 3. Transportation routes to Grand Coulee Dam

In the vicinity of the dam, SR 155 generally provides one travel lane in each direction and is classified by the Washington State Department of Transportation (WSDOT) as a minor arterial. From its intersection with SR 174 in west Grand Coulee, the highway heads northeast, through town, past Grand Coulee Dam and the Grand Coulee Dam Visitor Center. SR 155 provides three travel lanes in the vicinity of the Visitor Center and extending uphill beyond the dam crest, with the added third lane providing for southbound travel through the grade ascent. The road continues through west Grand Coulee Dam, crossing the Columbia River on the Columbia River Bridge about ½-mile downstream of the dam to east Grand Coulee Dam, then through Nespelem to its terminus in Omak.

SR 155 crosses the Columbia River bridge on the downstream side of Grand Coulee Dam, connecting Grant County to the south with Okanagan County to the north. It provides the only Columbia River crossing between SR 17 in Bridgeport, approximately 30 miles to the west, and Keller Ferry, serving SR 21 about 10 miles to the east. It is also used by vehicles to access SR 174 and the local communities of Coulee Dam, Grand Coulee, Elmer City, and Electric City. The main attractions on the east side of the bridge are the Coulee Dam Casino (Cervine 2016) and where the public tours of the Grand Coulee Dam begin at the Tour Building.

Average daily traffic volumes on SR 155 in the vicinity of the dam are shown in Table 6.

Table 6. Average daily two-way traffic – State Route 155, Coulee Dam

State Route	Milepost	Location	2012	2013	2014	2015
155	25.73	East of Junction SR 174 (after Junction SR 174 Wye Conn)	5,200[a]	5,300	5,500	5,100[a]
155	28.05	Southern entrance to the City of Coulee Dam (after Junction Grant Ave)	5,200	4,800[a]	4,900	5,000

[a] Based on Actual Count Data

Source: WSDOT 2015

Vehicles crossing the bridge are limited to 20,000 pounds per axle. The bridge provides one lane in each direction and has a restricted height of 14 feet, 3 inches. The road turns 90 degrees at the western approach, which has a yellow flashing signal and a posted 15-mile-per-hour speed limit.

Traffic becomes congested on the east and west approaches to the bridge when large trucks are crossing. The bridge provides access between portions of the Grand Coulee Powerplant complex on the opposite side of the river via Roosevelt Way in east Coulee Dam and SR 155.

Access to the Reclamation road across Grand Coulee Dam is located off SR 155 between the city of Grand Coulee and the town of Coulee Dam. This road, located atop the dam, served as SR 155 prior to 2001, when it was closed for public access as a result of security concerns. This road is still used by Reclamation for local access (Snavely 2016).

Existing Traffic

The Grand Coulee Dam, Visitor Center, and tours are popular tourist attractions. An average of about 225,000 people in an estimated 64,000 vehicles visited the dam during the 2016 fiscal year. Peak visitation occurs in July each year; in 2016, the daily July peak was 2,356 visitors and 673 vehicles (Snavely 2016). The Visitor Center is open daily (except New Year's Day, Thanksgiving, and Christmas) from 9:00 a.m. to 5:00 p.m., with extended hours between Memorial Day and September 30. A laser light show is presented nightly starting the Saturday of Memorial Day weekend through September 30. The 36-minute show, shown on the face of the dam and the powerhouses, is viewable from many locations in the downstream area and attracts large numbers of viewers each night. The only periods with notable traffic jams are July 4, as a result of the laser light show and fireworks, and possibly Labor Day weekend. Traffic-generating tourist attractions include dam tours, the Visitor Center, and the laser show (Hall 2016).

Presently, approximately 500 Reclamation employees work at Grand Coulee Dam, associated facilities, offices, and the powerhouses. Numerous contractors also work at these facilities, many who stay in local hotels, campgrounds, and rentals. Most Reclamation employees and contractors commute from Coulee Dam, Grand Coulee and Electric City, or from the

surrounding communities of Elmer City, Wilbur, Bridgeport, Nespelem, Almira, Hartline, Davenport, and Coulee City (Snavely 2016).

Grant County Transit provides 18-seat commuter transit service via the Route 59 bus between the dam and Moses Lake on SR 155, with one morning and one evening trip daily. Numerous vanpools are used by Reclamation employees to commute between Moses Lake, Spokane, and other communities. The Interior also subsidizes bicycle commuting to entice employees to reduce their carbon footprint (Snavely 2016).

Existing seasonal peak-hour traffic volumes are handled adequately during three shift changes without significant congestion. A brief pulse of traffic occurs daily between 4:00 p.m. and 5:00 p.m. when workers depart the powerhouses heading southbound across the river and up the hill. The existing traffic patterns associated with the current operation of Grand Coulee Dam and powerhouses are considered to be the local norm (Hall 2016).

Parking

Surface parking lots are located at each powerhouse and at the administrative area for Reclamation employees and contractors. Parking at the LPH is constrained by the geography of the site, so there is limited surplus parking capacity in this area.

Safety

In support of this analysis, WSDOT provided a history of officer-reported crashes that occurred at, or in the vicinity of, the following intersections near the City of Coulee Dam and the counties of Douglas, Grant, and Okanogan for the period of January 1, 2011, through December 31, 2015.

- Federal Reserve Rd. (also called SR 155) at Lincoln Ave
- SR 155 (milepost 28.04 – 28.07) at Grant Ave
- SR 155 (milepost 28.12 – 28.16) at Douglas Ave
- SR 155 (milepost 28.23 – 28.27) at Columbia Ave
- SR 155 (milepost 28.47 – 28.51) at Roosevelt Way

Review of crash data provided by WSDOT indicates that, during this time period, there are very few crashes at these intersections. Table 7 provides a summary of the reported crashes.

Table 7. Intersection crash data summary

Intersection	Date	Description	Severity
SR 155 at Lincoln Ave.	8/12	Hit Fixed Object	Injury
SR 155 at Grant Ave.	1/12	Ran Off Road (DUI)	Injury
	8/12	Hit Fixed Object	PDO
	7/14	Hit Bicycle	Injury

Intersection	Date	Description	Severity
SR 155 at Roosevelt Way	3/11	Hit Fixed Object	PDO
	1/13	Left Turning, Hit Oncoming Vehicle	Injury
	5/15	Lost Control of Motorcycle	Injury
SR 155 at Douglas Ave	No reported crashes	N/A	N/A
SR 155 at Douglas Ave	No reported crashes	N/A	N/A

PDO = property damage only

Source: WSDOT 2016

As indicated in Table 7, there were a total of seven crashes at these intersections over the 5-year time period. The intersections of SR 155 with Grant Avenue and Roosevelt Way had three each, while the intersection of SR 155 with Lincoln Avenue had one. There were no reported crashes at the intersections of SR 155 with Douglas and Columbia Avenues. Although sufficient traffic data to calculate a crash rate is not available, none of these intersections are anticipated to have a crash rate that would approach a threshold for a high-accident location (one crash per million entering vehicles).

3.7.2 Environmental Consequences

Significance Criteria

Potential adverse transportation impacts could be associated with implementation of the No Action and Action alternatives. A qualitative assessment of traffic impacts was performed, based on the construction procedures and equipment that would be used, review of existing conditions, and traffic levels on key roadways. Transportation impacts would be considered significant if construction or operation of the alternative caused substantial increases in traffic or disruption of existing vehicular traffic.

No Action Alternative

Under the No Action alternative, Reclamation would continue operating the G1-G18 generating units with no system improvements. This would likely increase the need for maintenance, resulting in greater repair costs and longer production outages. Repair costs and time needed to obtain replacement parts would continue to increase, based on the aging technology and scarcity of replacement parts. The timing and duration of future maintenance periods would depend on the nature of the problems to be resolved. Maintenance would be performed by existing Reclamation employees or contractors, as necessary.

Parking demand at the LPH may exceed supply during some maintenance tasks, requiring contractors to coordinate with Reclamation regarding alternative access methods, such as

ride-sharing from other parking lots or temporary use of visitor parking during low visitation periods.

It is estimated that the potential onsite contractor workforce would likely range from 20 to 30 workers per day during maintenance activities. Assuming that there is no ride-sharing, this increase in workers would likely result in an additional 20 to 30 daily peak hour vehicle trips to and from the site. This would result in an estimated increase of about 0.4 percent to 0.6 percent in the average daily two-way traffic on SR 155 between the entrance to the Town of Coulee Dam (mile marker 28.04) and the junction of SR 155 and SR 174 (mile marker 25.73). No adverse workforce-related traffic impacts have occurred from similar numbers of additional workers in the past, and none would be expected under this alternative.

Routine deliveries of maintenance-related materials and equipment would use existing roadways and be unlikely to cause adverse traffic impacts.

No significant changes to access, traffic, parking, or safety would result from maintenance activities related to this alternative.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time

Under Alternative B, Reclamation would overhaul and modernize the 18 generating units during a 12-year construction window beginning in 2018 and ending in approximately 2029. During this timeframe, transportation would be minimally impacted by additional vehicular trips generated by construction workers commuting to and from the powerhouses and deliveries of supplies, temporary bridge closures, and an increased demand for parking.

Access

As a whole, site access would not be impacted by the Project. However, the contractor may request that oversize loads be transported across the Columbia River bridge for deliveries to the powerhouses. If this were to occur, the limited lane width on this bridge could result in the bridge being temporarily closed to general traffic for brief durations. If the contractor were to request a bridge closure, they would be required to provide a traffic control plan, which would need to be submitted to WSDOT for approval.

Except for periods of cold weather, when road traction is a concern, the dam could be used as an alternative roadway to transport large, heavy loads that would temporarily close the bridge to general purpose traffic or would exceed the bridge load limits. Because of the limited frequency and duration of temporary bridge closures, the implementation of WSDOT-approved traffic control plans and the use of the dam as an alternative haul route, Alternative B should result in only negligible access impacts.

Traffic

Reclamation estimates this work would result in 10 to 20 additional workers (contractor employees) on the Project site from 6:30 a.m. to 4:30 p.m. Monday through Thursday. Assuming a worst-case scenario (no ride-sharing), this would result in 10 to 20 additional daily peak-hour vehicle trips to and from the temporary parking lot, an increase of about 0.4 percent in the average daily two-way traffic on SR 155 between the entrance to the town of Coulee Dam (mile marker 28.04) and the junction of SR 155 and SR 174 (mile marker 25.73). In addition, there would also be some shuttle trips transporting workers to and from the LPH. No adverse workforce-related traffic impacts have occurred from similar numbers of additional workers and associated increases in vehicle trips in the past, and none would be expected for this alternative.

Supplies for the Project will be delivered by truck via SR 155 and 174. The nearest rail depot is approximately 28 miles southwest, near Coulee City. Delivery truck traffic will increase slightly during the Project, but not enough to generate more than negligible impacts on local traffic.

Parking

Parking is constrained at the LPH as a result of a small surface lot. To address this constraint, Reclamation will provide a temporary parking lot north of the powerhouses (see Figure 2 for location of this Parking Area, shown in green). Contractors will need to arrange shuttles from the temporary parking lot to the LPH. Additional parking could be provided at Reclamation's construction office location or at the south end of the visitor lots. By providing temporary parking for contractors, the Project will not decrease public or employee parking capacity.

Safety

Anticipated minor changes in transportation patterns and minor traffic volume increases resulting from this alternative are not expected to result in increased risk of vehicular collisions in the vicinity of the Project. To prevent temporary restrictions to access by emergency response vehicles by construction or transport of oversized loads, prior arrangements would be made with the fire department as necessary.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a Time

This alternative would be similar to Alternative B, but with a longer construction timeframe. Rather than completing work on two units at a time, work would only occur on one unit at a time, adding an estimated 6 to 7 years to the Project duration (Denton 2017c). Depending on speed of completion, Reclamation anticipates the construction portion of the Project to occur from 2018 to 2035 or 2036. The impacts on transportation under Alternative C would be slightly less than described under Alternative B, but with a longer duration.

Access

As with Alternative B, frequency and duration of bridge closures would depend on factors such as sequencing of contractor deliveries, the capacity of each load, and the amount of each expedited order. However, bridge closures will likely be less frequent than under Alternative B. As indicated in the discussion for Alternative B, WSDOT-approved traffic control plans and potential use of the dam for deliveries will help minimize access impacts.

Traffic

Alternative C would require fewer workers (contractor employees) than Alternative B on the Project site from 6:30 a.m. to 4:30 p.m. Monday through Thursday. This relatively minor addition to the local workforce will result in a correspondingly minor increase to local traffic. Deliveries of supplies will be less frequent than under Alternative B but will occur for a longer duration.

Parking

Temporary parking for contractor vehicles will be provided in designated locations, and contractors will need to arrange shuttles from the provided staging/parking areas to the LPH, similar to Alternative B. The temporary parking facilities may not need to be as large as under Alternative B, as a result of the anticipated smaller workforce.

Safety

As with Alternative B, minor changes in transportation patterns and traffic volume increases resulting from this alternative are not expected to result in increased risk of vehicular collisions in the vicinity of the Project. Prior arrangements would be made with the fire department, as necessary, in the event of temporary access restrictions resulting from construction or transport of oversized loads.

3.7.3 Mitigation

Alternative A – No Action

No mitigation is required.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time

Provision of temporary contractor parking facilities and compliance with the contract specifications and Federal and state requirements for transport of oversize loads would ensure there are no significant adverse transportation impacts. Safety would be optimized through advance coordination with emergency service providers during transport of oversize loads. No mitigation would be needed for either of these alternatives.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a Time

Mitigation for Alternative C will be the same as for Alternative B.

3.7.4 Cumulative Impacts

Other projects identified in the Grand Coulee area include the TPP Overhaul, John W. Keys III Pump-Generating Plant Modernization Project, and construction of a new fire station. Construction traffic generated by the Preferred Alternative would add to that generated by these three projects. As shown on Table 8, the combined increase as the result of the TPP, John W. Keys III Pump-Generating Plant Modernization Project, and this Project is expected to be about 1.8 percent in the average daily two-way traffic on SR 155.

Table 8. Cumulative trip growth

Project	Milepost 25.73	Milepost 28.04	Year	Trips	% Trip Growth
TPP	5,100	5,300	2017	40	.8
John W. Keys III Pump-Generating Plant Modernization Project	5,700	5,400	2010	32	1.2
Fire Station[a]	5,300	No data	2013	No data	No data
G1 – G18	5,100	5,000	2015	20	0.4
Cumulative Trip Growth				**92**	**1.8**

[a] No data on construction trip estimates are included in the FONSI Final Environmental Assessment New Fire Station

Source: Reclamation 2015

As addressed above, the additional contract workers and deliveries associated with either alternative is expected to add a negligible number of vehicles to the cumulative traffic volumes in the vicinity of the dam, and all roadways are expected to operate in an acceptable manner. No cumulative effects related to access, traffic, parking, or safety are anticipated as a result of the Project alternatives.

3.8 Socioeconomics

The study area for potential socioeconomic impacts from the Project consists of the five-county region comprising Douglas, Ferry, Grant, Lincoln, and Okanogan Counties in Washington State.

Data from the Washington State Office of Financial Management and the U.S. Census Bureau websites were used to describe the historical and current population in the study area. Data from the Washington State Employment Security Department were used to describe the study area's historical and current employment and unemployment characteristics, and income by industry.

The IMPLAN model, a regional input-output economic model, was used to estimate the regional economic impacts resulting from changes in construction expenditures for the Project. The regional economic impact analysis considers both the initial or direct impact on the primary affected industries and the secondary impacts resulting from those industries that provide inputs to the directly affected primary industries. This analysis also includes the changes in economic activity stemming from household spending of income earned by those employed in the sectors of the economy affected either directly or indirectly. These secondary impacts are often referred to as multiplier effects.

3.8.1 Affected Environment

Population

The estimated population and the changes in the population in the study area, Washington State, and the United States are presented in Table 9. The population of the five-county study area has been increasing since 2000, with most of the population increases occurring in Grant and Douglas Counties. The population of the study area has increased approximately 18 percent, from 164,000 to 194,000. The study area has experienced average growth rates similar to those in the State of Washington, and slightly higher than the national average.

Table 9. Study area population

Study Area	2000	2010	2015	Average Annual Growth Rate	
				2000 to 2010	2010 to 2015
Douglas	32,603	38,431	39,990	1.7%	0.8%
Ferry	7,260	7,551	7,710	0.4%	0.4%
Grant	74,698	89,120	93,930	1.8%	1.1%
Lincoln	10,184	10,570	10,720	0.4%	0.3%
Okanogan	39,564	41,120	41,860	0.4%	0.4%
Study Area Total	164,309	186,792	194,210	1.3%	0.8%
WA State	5,894,143	6,724,540	7,061,410	1.3%	1.0%
United States	282,162,411	309,346,863	321,418,820	0.9%	0.8%

Source: Washington State Office of Financial Management 2016; U.S. Census Bureau 2016

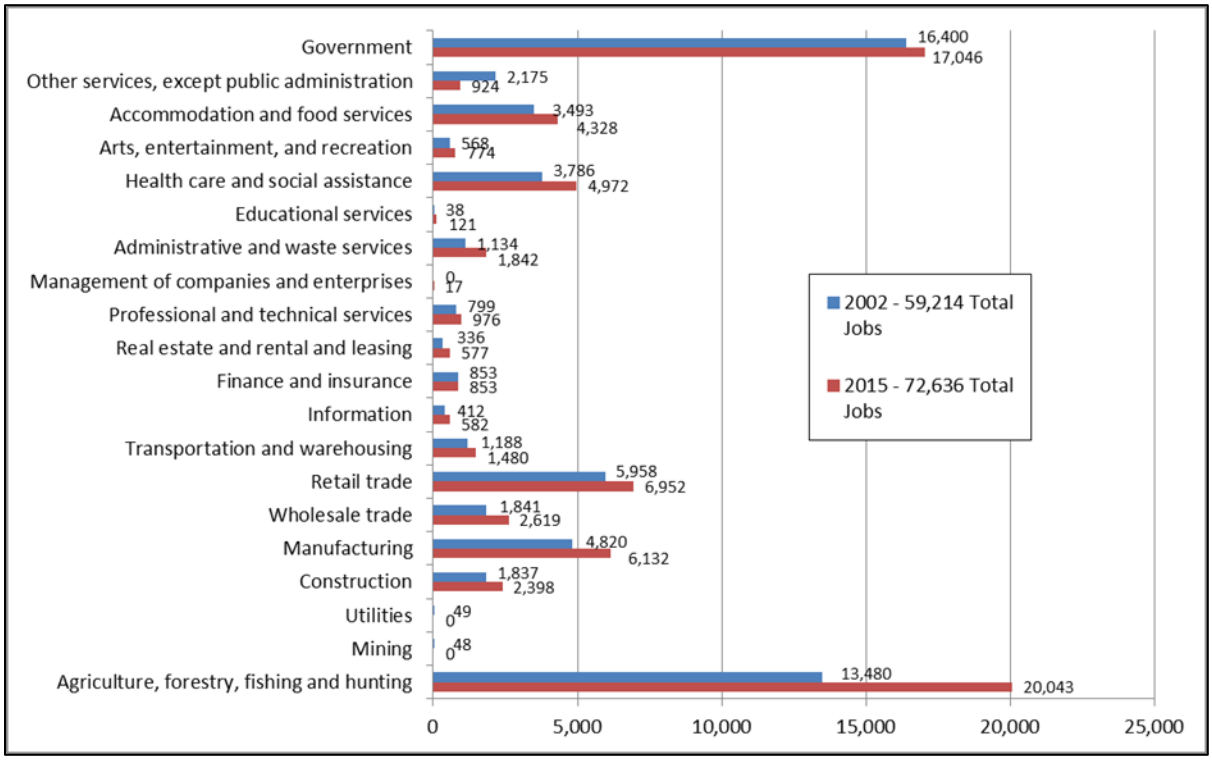
Local School Enrollments

GCDSD provides public primary education for the Grand Coulee EA vicinity, including the town of Coulee Dam and the city of Grand Coulee. The district operates three schools in the town of Coulee Dam, including Lake Roosevelt Elementary School, Lake Roosevelt Junior/Senior High School, and Lake Roosevelt Alternative School. Based on the

Washington State Report Card data, GCDSD's enrollment in October 2016 was 719 students (OSPI 2017a). GCDSD employed 41 classroom teachers, and their budget relies on state funds (63 percent), Federal funds (23 percent), local sources (14 percent), and very few other sources (OSPI 2017b).

Employment

Figure 4 displays average employment by industry for study area. In 2002, an estimated 59,000 people were employed in the five-county study area. By 2015, average annual employment increased approximately 23 percent to nearly 73,000. Employment in the study area is concentrated in the agricultural, forestry, fishing, and hunting sector, as well as local, state, and county government. These two sectors account for approximately 51 percent of jobs in the study area. Retail trade, manufacturing, health care, and accommodation and food services are also growing industries, accounting for a combined 31 percent of total employment.



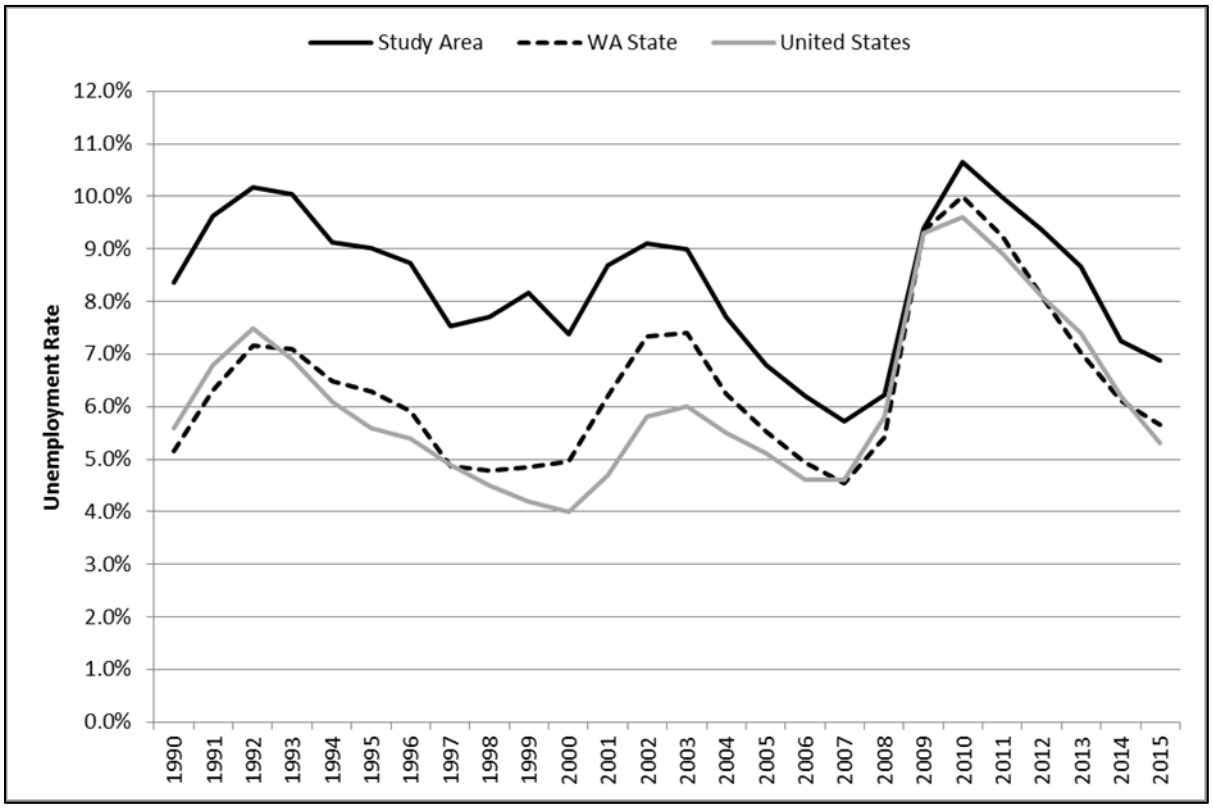
Source: Washington State Employment Security Department 2016

Figure 4. Study Area Covered Employment, 2002 and 2015

Unemployment

Unemployment rate trends for the five-county study area, Washington State, and the United States are shown in Figure 5. In general, the study area's unemployment rate has trended higher than the state's average, and has experienced greater volatility. From 1990 to 2001, the study area has experienced an unemployment rate two to three points more than the state. Starting in 2001, the study area's unemployment rate has been less than 2 points below the

state average; it equaled the state average in 2009. With the national economic recession from 2007 to 2009, unemployment rose in the study area, the state, and the nation. Since 2010, the unemployment rate for the study area has declined each year from a high of 10.7 percent in 2010 to 6.9 percent in 2015.



Source: Washington Employment Security Department 2016, U.S. Bureau of Labor Statistics 2016

Figure 5. Unemployment Rate for Study Area, Washington State and the U.S., 1990-2015

Payroll by Industry

Table 10 presents the taxable wages by industry in the study area. Covered payroll includes the total wages and taxable wages from quarterly unemployment tax forms filed by employers in the study area. The government sector generates the largest portion of payroll in the region (32.5 percent of total regional payroll). The next-largest sector is related to agriculture, forestry, fish, and hunting (19.1 percent of total payroll). Ranking third is the manufacturing sector (11.8 percent of total payroll).

Table 10. Study Area Covered Payroll by Industry, 2015

Industry	Covered Payroll, 2015 (millions)	Percent of Total
Agriculture, forestry, fishing and hunting	$479.1	19.1%
Mining	$0.0	0.0%

Industry	Covered Payroll, 2015 (millions)	Percent of Total
Utilities	$0.0	0.0%
Construction	$99.5	4.0%
Manufacturing	$296.3	11.8%
Wholesale trade	$130.6	5.2%
Retail trade	$185.5	7.4%
Transportation and warehousing	$57.7	2.3%
Information	$26.8	1.1%
Finance and insurance	$38.2	1.5%
Real estate and rental and leasing	$14.8	0.6%
Professional and technical services	$58.9	2.3%
Management of companies and enterprises	$1.3	0.1%
Administrative and waste services	$40.8	1.6%
Educational services	$2.1	0.1%
Health care and social assistance	$163.1	6.5%
Arts, entertainment, and recreation	$14.9	0.6%
Accommodation and food services	$66.5	2.6%
Other services, except public administration	$20.3	0.8%
Government	$817.7	32.5%
Total	**$2,514.0**	**100.0%**

Source: Washington State Employment Security Department 2016

3.8.2 Environmental Consequences

Significance Criteria

Changes in the socioeconomic resources resulting from changes in construction and operation were evaluated in terms of their direct impact on population, employment (labor

force and unemployment rate), income, and overall economic development. The changes in the socioeconomic resources are a direct result of the changes in employment (number of workers during project construction) and income (measured as expenditures during project construction) in the study area.

In addition to the direct economic effects, the Project will also result in secondary (indirect and induced) economic effects. These economic effects include changes in characteristics such as regional employment and income. Secondary employment effects would include indirect employment resulting from the purchase of goods and services by firms involved with construction, and induced employment because of construction workers spending their income within the study area. In addition to these secondary employment impacts, construction activity will also result in indirect and induced incomes. The magnitudes of these economic effects depend on the initial changes in economic activity within the region (such as construction expenditures), the interactions within the regional economy, and the leakage of economic activity from this regional economy to the larger, surrounding economy. Economic linkages create multiplier effects in a regional economy as money is circulated by trade. Economic leakages reduce the multiplier effects in a regional economy.

The IMPLAN model was used to estimate the regional economic effects of construction-related expenditures for the Project in a widely used economic input-out model. The IMPLAN package includes 1) estimates of final demands and final payments for counties developed from government data; 2) a national average matrix of technical coefficients; 3) mathematical tools that help the user formulate a regional model; and 4) tools that allow the user to input more accurate data or add data refinement, conduct impact analyses, and generate reports.

Indirect and induced economic effects during construction were evaluated using an IMPLAN model of the five-county region and the 2015 IMPLAN county data. The Project construction costs were refined using assumptions on construction duration, construction cost split (between materials/equipment and labor), origin and size of labor force, and origin of construction materials. Because the IMPLAN model is an annual model that evaluates the regional economic effects of changes in local expenditures, it was necessary to identify which of the Project's costs were on locally sourced material and labor inputs. As with any model, the accuracy of the results depends on the accuracy of the inputs. Cost estimates are preliminary and may change as engineering design is refined.

Construction Costs

Table 11 shows the total construction costs associated with the construction of Alternatives B and C. The Project's total design and construction cost is estimated to be $332 million for Alternatives B and C (in 2015 dollars) (Denton 2017a); of this, 30 percent is assumed to be the cost of materials, while the remaining 70 percent is assumed to be construction payroll. Of the estimated cost on materials, 10 to 20 percent is assumed to be sourced locally (within the five-county region). The remaining 80 to 90 percent is assumed to be sourced from

outside the study area. The Project anticipates that most of the construction workforce will come from outside the five-county region.

Table 11. Project Construction Costs for Alternative B and C

Costs	Alternative B[a]		Alternative C[b]	
	10% Local Costs	20% Local Costs	10% Local Costs	20% Local Costs
Total Construction	$332,000,000	$332,000,00	$396,425,362[c]	$396,425,362[c]
Local construction	$33,200,000[d]	$66,400,000[e]	$39,642,536[d]	$79,285,072[e]
Labor (30%)	$9,960,000	$19,920,000	$11,892,761	$23,785,522
Non-labor (70%)	$23,240,000	$46,480,000	$27,749,775	$55,499,551

[a] Alternative B – construction schedule assumed to be 12 years
[b] Alternative C – construction schedule assumed to be 18 years
[c] Alternative C costs escalated by 3 percent annually between Year 13 and Year 18 of construction (Denton 2017b)
[d] Local (within the five-county region) costs assumed to be 10 percent of total construction costs
[e] Local (within the five-county region) costs assumed to be 20 percent of total construction costs
Notes: Cost estimates are in 2015 dollars (Denton 2017c).

Construction of the Project is expected to take 12 years for Alternative B and 18 years for Alternative C. Because economic impacts are typically measured and reported in annual terms, Project costs were converted to average annual expenditures for the duration of the construction period. These annual estimates of the construction phase expenditures were used as input into the regional IMPLAN model to estimate the changes in regional annual employment and income during the construction phase of the Project.

The annual costs used to estimate the regional economic impacts associated with the construction of Alternative B and C are shown in Table 12. The costs in the first column under each alternative represents the average annual expenditures when local costs are assumed to be 10 percent of the total construction costs, and the costs in the second column represents the average annual expenditures, when the local costs are assumed to be 20 percent of the total construction costs.

Table 12. Average Annual Costs by Alternative

Local Costs	Alternative B		Alternative C	
	10% Local Costs	20% Local Costs	10% Local Costs	20% Local Costs
Labor	$830,000	$1,660,000	$660,709	$1,321,418
Non-labor	$1,936,667	$3,873,333	$1,541,654	$3,083,308

Note: Cost estimates are in 2015 dollars (Denton 2017c)

Source: Druliner 2017; Denton 2017a; Denton 2017b

The regional economic effects on employment and income in the five-county region were evaluated for Project construction for each alternative. Changes are shown relative to existing conditions and the No Action alternative. The direct employment estimates were derived using average prevailing wage for construction journeys of $40 an hour (Washington State Department of Labor and Industries 2017).

No Action Alternative

Under the No Action alternative, Reclamation would continue operating the G1-G18 generating units with no system improvements. This would likely increase the need for maintenance, resulting in greater repair costs and longer production outages. Repair costs and time needed to obtain replacement parts would continue to increase based on the aging technology and scarcity of replacement parts. The timing and duration of future maintenance periods would depend on the nature of the problems to be resolved. Maintenance would be performed by existing Reclamation employees or contractors, as necessary.

Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time

Construction Impacts

The construction of the Project is expected to create employment opportunities within and outside of the Grand Coulee EA study area. It is expected that a majority of these jobs would be performed by separate contractor workforces that would be onsite and in the community only for the duration of their specific work assignment. Many will use temporary housing in the area, including motels, RV parks, and campgrounds. It is not expected that the tradesmen and workers would relocate their families to the temporary job location.

Table 13 demonstrates that in addition to the average annual direct employment of 10 to 20 full-time equivalent jobs (FTE), the construction phase of the Project would result in annual indirect and induced employment within the study area of 18 to 35 FTEs and 5 to 10 FTEs, respectively. The total annual construction employment in the five-county region is estimated to range from 33 to 65 FTEs.

Table 13. Regional Employment and Income Associated with Construction of Alternative B

Impact	Employment (FTEs)	Labor Income
Direct	10 to 20	$2,767,000 to $5,533,000
Indirect	18 to 35	$869,000 to $1,737,000
Induced	5 to 10	$193,000 to $385,000
Total	**33 to 65**	**$3,828,000 to $7,656,000**

Note: Cost estimates are in 2015 dollars (Denton 2017c)

Source: Druliner 2017; Denton 2017a; IMPLAN

As expected, the increase in regional employment would be accompanied by increased levels of income within the region (Table 13). Construction of the Project is expected to result in about $2.8 to $5.5 million in annual direct income to the five-county region. The annual indirect income is estimated to range from $869,000 to $1.7 million, while annual induced income is approximately $193,000 to $385,000.

The increases in employment and income from Project construction of Alternative B are minor compared to the study area's total employment and incomes. When compared to the five-county region, construction of Alternative B will represent less than 0.1 percent of total employment.

Schools

Reclamation does not expect the contractor workforce to relocate permanently to the communities surrounding Grand Coulee during their specific work assignments. This assumption is based on the understanding that construction workers typically move from job site to job site for the duration of their work. They use temporary accommodations such as motels/hotels, RV parks, and campgrounds during the week, and return home when they are off work.

Based on information in the John W. Keys III Pump-Generating Plant Modernization Project Final Environmental Assessment (Reclamation 2012) and the Grand Coulee Dam School District's (GCDSD) comments on the draft EA, it is possible that some of the contractor workforce may temporarily relocate to the area and thus enroll their school-age children in the local schools. For the proposed project, Reclamation conservatively assumed half of the total workers (direct, indirect, and induced, Table 13) not already living in the local area would relocate there temporarily and enroll one child in the GCDSD, resulting in an increased enrollment of 17 to 33 students. This estimate is considered very high because it accounted for all of the workforce, inclusive of direct, indirect, and induced employment, which was calculated herein for the entire region. It also accounted for all the contract workforce (directs) being present at the same time. In reality, 10 different contracts will take place over the Project duration, and they will be spaced out according to which components

are being worked on at that time. The quantity of work occurring at one time is limited by space within the powerhouses for equipment, material, and laydown.

Although the total regional employment number is likely high, Reclamation chose to use the total to account for any new jobs that may be created in the community in support of the Project.

Based on 2014-2015 GCDSD funding revenues and enrollment data, the increase in student population would result in a reduction in the average funding level per student of between 2.3 and 4.5 percent until additional funding sources respond (OSPI 2017b). In Washington, most of the large school entitlement programs (basic education, special education, learning assistance, and bilingual education) are tied to student enrollment and fluctuate as enrollment changes throughout the school year. Thus, while the reduction in funding has implications for the GCDSD's short- and long-range planning and budgeting, the majority of the funding lag is expected to have a duration of less than one academic year. After that time, state and Federal funding levels would increase in response to the added student population (Federal funding accounted for 23 percent of GCDSD's revenues in 2014-2015). The increase in student population could also increase the student-to-instructional-staff ratio, depending on the grade distribution of the additional students.

Tribal Employment Rights Ordinance

Tribal Employment Rights Ordinances (TERO) extend Indian preference hiring to all construction projects on or near an Indian Reservation. A TERO program monitors and enforces employment and contracting rights of Indians and ensures their rights are protected and exerted. Portions of the work associated with the modernization and overhaul of the G1-G18 generating units would be located on or near the CTCR Reservation. The CTCR have enacted a TERO (Colville Tribal Law and Order Code, Title 10 Employment and Contracting Chapter 10-1 Tribal Employment Rights [CTCR 2009]) and other ordinances that may be applicable to this work. Tribal ordinances would be included among the laws, codes, and regulations covered by the Permits and Responsibilities clause of the Reclamation contract for the work. Reclamation's contractor would be directed to contact the CTCR Tribal Employment Rights Office for information about these requirements. However, Reclamation's Contracting Officer is not a party to enforcing Indian preference requirements; it is a matter solely between the Tribe and the contractor.

Operational Impacts

The impacts associated with the construction phase are temporary and, as such, different from the long-term effects associated with the operational phase of the Project. It would be expected that Reclamation employees would continue to reside at their current locations, and no new jobs would directly result from the Project. No changes in population would be expected within the study area as a result of long-term operations of the Project. Maintenance would be performed by existing Reclamation employees or contractors, as necessary.

Operational impacts would consist of long-term effects and changes in the local economy from secondary expenditures of the Reclamation employees, such as at local eateries and gas

stations, and from long-term effects associated with revenue from property taxes, payroll taxes, or income taxes. Either of the action alternatives would be expected to have long-term, minor beneficial impacts associated with increased spending from secondary expenditures of Reclamation employees at local businesses. No changes to socioeconomic conditions would be expected within the study area.

Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a Time

Construction Impacts

This alternative would be similar to Alternative B, but with a longer construction timeframe. Rather than completing work on two units at a time, work would only occur on one unit at a time, adding an estimated 6 to 7 years to the Project duration (Denton 2017c). Depending on the speed of completion, Reclamation anticipates the construction portion of the Project to occur from 2018 to 2035 or 2036. The impacts on socioeconomics under Alternative C would be slightly less than described under Alternative B, but with a longer duration.

Similar to Alternative B, this alternative is expected to create employment opportunities within and outside the Grand Coulee EA study area. It is expected that a majority of these jobs would be performed by separate contractor workforces that would be onsite and in the community only for the duration of their specific work assignment. Many will use temporary housing in the area, including motels, RV parks, and campgrounds. It is not expected that the tradesmen and workers would relocate their families to the temporary job location.

Table 14 summarizes the annual construction phase employment and income effects of the Project, assuming a construction schedule of 18 years. In addition to the average annual direct employment of 8 to 16 FTEs, the construction phase of the Project would result in annual indirect and induced employment within the study area of 14 to 28 FTEs and 4 to 8 FTEs, respectively. The total annual construction employment in the five-county region is estimated to range from 26 to 52 FTEs.

Table 14. Regional Employment and Income Associated with Construction of Alternative C

Impact	Employment (FTEs)	Labor Income
Direct	8 to 16	$2,202,000 to $4,405,000
Indirect	14 to 28	$691,000 to $1,383,000
Induced	4 to 8	$153,000 to $307,000
Total	**26 to 52**	**$3,047,000 to $6,094,000**

Note: Cost estimates are in 2015 dollars (Denton 2017c).

Source: Druliner 2017; Denton 2017a; IMPLAN

As expected, the increase in regional employment would be accompanied by increased levels of income within the region (Table 14). Construction of the proposed project is expected to result in approximately $2.2 to $4.4 million in annual direct income to the five-county region. The annual indirect income is estimated to range from nearly $691,000 to $1.4 million; induced income is approximately $153,000 to $307,000.

The increase in employment and income from project construction of Alternative C is minor compared to the study area's total employment and incomes, and is less than those under Alternative B. When compared to the five-county region, construction of Alternative C will represent less than 0.1 percent of total employment.

Schools

Reclamation does not expect the contractor workforce to relocate permanently to the communities surrounding Grand Coulee during their specific work assignments. This assumption is based on the understanding that construction workers typically move from job site to job site for the duration of their work. They use temporary accommodations such as motels/hotels, RV parks, and campgrounds during the week, and return home when they are off work.

Based on information in the John W. Keys III Pump-Generating Plant Modernization Project Final Environmental Assessment (Reclamation 2012) and the Grand Coulee Dam School District's (GCDSD) comments on the draft EA, it is possible that some of the contractor workforce may temporarily relocate to the area and thus enroll their school-age children in the local schools. For the proposed project, Reclamation conservatively assumed that half of the total workers (direct, indirect, and induced employment, Table 14) not already living in the local area would relocate there temporarily and enroll one child in the GCDSD, resulting in an increased enrollment of 13 to 26 students. This estimate is considered very high because it accounted for all the workforce, inclusive of direct, indirect, and induced, which was calculated herein for the entire region. It also accounted for all of the contract workforce (directs) being present at the same time. In reality, 10 different contracts will take place over Project duration, and they will be spaced out according to which components are being worked on at that time. The quantity of work occurring at one time is limited by space within the powerhouses for equipment, material, and laydown.

Although the total regional employment number is likely high, Reclamation chose to use the total to account for any new jobs that may be created in the community in support of the Project.

Based on 2014-2015 GCDSD funding revenues and enrollment data, the increase in student population would result in a reduction in the average funding level per student of between 1.8 and 3.5 percent until additional funding sources respond (OSPI 2017b). In Washington, most of the large school entitlement programs (basic education, special education, learning assistance, and bilingual education) are tied to student enrollment and fluctuate as enrollment changes throughout the school year. Thus, while the reduction in funding has implications for the GCDSD's short- and long-range planning and budgeting, the majority of the funding lag

is expected to have a duration of less than one academic year. After that time, state and Federal funding levels would increase in response to the added student population (Federal funding accounted for 23 percent of the District's revenues in 2014-2015). The increase in student population could also increase the student-to-instructional-staff ratio, depending on the grade distribution of the additional students.

Tribal Employment Rights Ordinance

TERO information would be the same as Alternative B.

Operational Impacts

Economic impacts associated with the operation of Alternative C would be similar to Alternative B. Alternative C would likely have increased maintenance costs and longer production outages compared to Alternative B, as aging equipment would be in use for a longer period of time. The timing and duration of future maintenance periods would depend on the nature of the problems to be resolved. Maintenance would be performed by existing Reclamation employees or contractors, as necessary.

3.8.3 Mitigation

There was no mitigation identified for any of the alternatives.

3.8.4 Cumulative Impacts

Other projects identified in the Grand Coulee area include the TPP Overhaul, John W. Keys III Pump-Generating Plant Modernization Project, and construction of a new fire station. It is anticipated that the new fire station will be complete before the Project begins. Programmed maintenance, overhauls, and construction of the Project would be concurrent with activities at the TPP and John W. Keys III Pump-Generating Plant and would contribute to cumulative regional economic impacts. While these and other actions in the region would provide an important beneficial contribution to economic activity over a multi-year period, the cumulative regional economic effects of these actions would still be very small relative to the overall regional economy.

The presence of 13 to 26 additional students in the school district during the construction phase of the Grand Coulee EA project is not anticipated to have long-term implications, even in the presence of the other projects identified, for several reasons: (1) Reclamation considers the student enrollment to be very high because this estimate looked at all the contract workforce being present at the same time, which is not anticipated to be true; and (2) school funding, which typically fluctuates throughout the school year depending on enrollment, would not be expected to lag more than one academic year. In addition, the amount of work that can occur at one time is limited by space within the powerhouses for equipment, material, and laydown. Thus, cumulative impacts associated with increased school enrollment are expected to be small and temporary.

Chapter 4. Consultation and Coordination

4.1 Introduction

This chapter summarizes the activities that took place for Reclamation's public scoping activities for the Project. Activities involved soliciting comments from the general public, state and Federal government agencies, and representatives of the CTCR and the STOI. The primary mechanism used to solicit public comments was advertisements, mailings, and the creation of a website informing the public about Reclamation's intent to conduct a NEPA analysis.

The 30-day scoping period was scheduled to end on November 7, 2016; however, it was extended until November 27, 2016, at the request of the public. An official Federal scoping notice was released on October 7, 2016, to all media outlets and newspapers in the Pacific Northwest (Appendix A). A revised scoping notice extending the public comment period was released on November 4, 2016, to the same media outlets (Appendix A).

Following the scoping period, activities included ongoing interactions with the public, CTCR, STOI, and agencies during preparation of the EA. The public, CTCR, STOI, and agencies were given the opportunity to review and comment on the Draft EA during the public comment period.

4.2 Public Scoping

4.2.1 Agency Consultations

National Historic Preservation Act

The NHPA was enacted in 1966 and is used to protect historical properties. The Act required the Federal government to partner with states, local governments, and Indian tribes to identify and protect eligible properties. All Federal actions must be analyzed to assess for possible effects on these properties. The process for implementing the NHPA is defined in Federal regulations (30 CFR 800) and includes consultation with the SHPO, THPO, and ACHP.

In letters dated March 8, 2016, Reclamation notified the Washington SHPO and the CTCR THPO of the Project's APE (Smith 2016a and 2016b). Copies of agency correspondence relating the Project's APE is included in Appendix C. The SHPO and THPO concurred with the APE (Whitlam 2016; Moura 2016), and stated that the historical resources APE would include the following locations:

- LPH Interior and Transformer Deck
- RPH Interior and Transformer Deck
- Two moveable Gantry cranes on top of Dam
- Two Cyclops cranes on south faces below powerhouses

The APE was not expanded to include visual impacts because of minimal exterior modifications to the powerhouses and dam.

Reclamation identified nine staging areas. These locations would be used temporarily for storage of supplies and equipment during construction. Use of these areas would have no impact on built environment resources and have been evaluated for archaeological effects in the Historic Resources Technical Report (CH2M 2017).

4.2.2 Comment Solicitation and Informational Activities

Reclamation used several mechanisms to inform the public about the Project and encourage local residents, Tribal members, and agencies to engage with Reclamation during and following the scoping period.

4.2.3 Mailings

Scoping letters explaining the Project, advertising the comment period, and soliciting comments were sent to interested publics, local elected officials and organizations, Federal and state agencies, U.S. congressional representatives, and Tribal entities. The scoping letter also described the ways that people could provide project ideas or comments to Reclamation. A second scoping letter was sent to recipients on the mailing list indicating the extension of the comment period. Appendix A contains the scoping letters, as well as a list of all the persons, agencies, and groups on the scoping letter mailing list.

4.2.4 Internet Postings

Several Reclamation websites provide information about the Project.

- Links to all news releases are found at https://www.usbr.gov/newsroom/.
- The original Project-specific news release is found at https://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=56867 and the news release indicating the comment period extension is found at https://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=57172.
- The website designed specifically to provide Project-related information is found at https://www.usbr.gov/pn/programs/ea/wash/gcpowerhouse/index.html. The Draft EA, Final EA and FONSI, as well as other Project-related documents, will be housed on the Project-specific website.

4.2.5 Meetings

There were no formal public scoping meetings; however, Reclamation met informally with the affected Native American Tribes to discuss the Project and hear their concerns. There were no agency scoping meetings.

4.2.6 Outcomes

Public Response and Details

Appendix A contains the public comment e-mails and letters. Input received from the comments were compiled in a summary, which presents a general overview of the documented comments and represents the main themes and opinions expressed by the public.

Summary of Public Scoping Comments

Reclamation received 23 individual scoping comments about the Project. Table 17 lists all of the comments received by Reclamation and how Reclamation addressed each comment. This summary presents a general overview of the documented comments and represents the main themes and opinions expressed by the public. The public comments addressed a wide range of topics, with many topics being represented by only one comment. The summary points below only address comments that were repeated in several comment responses. Table 17 shows the comments in their entirety.

Key Findings (in order of most frequently repeated comments; the number in parentheses indicates the number of times comment was repeated):

- Reclamation should investigate providing fish passage (6)
- Ensure the protection of tribal resources (4)
- Support for the action alternatives (3)
- Work with local government and organizations to improve the local economy (2)

Table 15. Public Scoping Comments Delivered to Reclamation in Response to the Public Scoping Letter

Comment	Reclamation Response
Request to analyze the direct, indirect, and cumulative effects of the Project on the annual 181-D payments to the Colville Confederated Tribes, including impacts resulting from decreased power generation during work to modernize and overhaul the G1 to G18 generating units, as well as any effects resulting from operation of the modernized units.	Reclamation does not anticipate any such changes during the modernization work. Although we will have multiple units out, the outages will not be different from current operations. Therefore, we do not expect a change in power generation from this Project that would impact the 181-D payments.

Comment	Reclamation Response
Request that Reclamation analyze the direct, indirect, and cumulative effects of construction and operation of the Project on resident fish populations in Lake Roosevelt.	During scoping and alternative development, Reclamation determined the environmental elements would be analyzed in the Draft EA based on internal and external scoping, knowledge of the Project, and existing conditions. Because Reclamation is not changing operations of Grand Coulee Dam, we determined that we would not have an impact on resident fish populations in the reservoir or resident and anadromous fish populations downstream of the Project as a result of modernization work. Project activities will occur in the powerhouses and on the dam structure (cranes).
Request that the Bureau analyze whether the Project will have any direct, indirect, or cumulative impacts on cultural resources, anadromous fish, and future anadromous fish passage at Grand Coulee Dam.	Reclamation determined which environmental elements would be analyzed in the Draft EA based on scoping of issues and whether impacts would occur. Because Reclamation is not changing operations of Grand Coulee Dam, we determined that we would not have an impact on resident fish populations in the reservoir or downstream of the Project. Project activities will occur in the powerhouses and on the dam structure (cranes) and so therefore would not impact reservoir conditions. Cultural resource effects from the alternatives will be analyzed in the EA.
The Drum Gate Maintenance Structure (DGMS) is part of the overall updating and maintenance projects for Grand Coulee Dam, including this G1 to G18 Modernization and Overhaul Project. Reclamation should consider these planned projects as a whole to avoid any potential segmentation issues that could arise under NEPA.	Reclamation continues to make progress on the drum gate maintenance, but has not yet completed a conceptual design. As the drum gate maintenance project matures, it will undergo a NEPA evaluation with a review of cumulative effects.
Given the potential scope of this work and other work planned, Reclamation must ensure that its obligations under 16 U.S.C. Section 839b(h)(l l)(A)(i)&(ii) are addressed.	The Project will not preclude our potential to address obligations under 16 U.S.C. Section 839b(h)(l l)(A)(i)&(ii) in the future.

Comment	Reclamation Response
All the maintenance and upgrade projects should be combined into one analysis and should include studies and potential modifications and additions that address fish passage and re-establishment measures outlined in the Northwest Power and Conservation Council 2014 Fish and Wildlife Program, and those same reintroduction considerations that will be part of the Columbia River System Operations Environmental Impact Statement process.	Reclamation will not address fish passage and re-establishment at this time for this Project, as those elements are outside the scope. This Project will not preclude or in any way impact our future ability to consider fish passage or re-establishment.
The Grand Coulee Dam should be modernized for a future with anadromous fish occupying the habitats above Grand Coulee Dam.	Fish passage is outside the scope of this Project. We are proposing to modernize the powerhouses' components at this time while not changing operations.
Requests that Reclamation, as part of this process, review the Spokane Tribe's 2014 Fish and Wildlife Program and develop a list of fish and wildlife actions that could be addressed at the same time as this project to ensure these funds are used in the most efficient manner possible while fulfilling all of Reclamation's obligations which include the protection, mitigation, and enhancement of fish and wildlife.	The Project will not preclude us from doing future fish and wildlife projects. We do not anticipate affecting fish or wildlife resources by implementing the Project. We are proposing to do the modernization without changing operations to avoid any impacts to fish, wildlife, and water quality/hydrology.
This project and the other refurbishment projects at Grand Coulee will affect the Spokane Tribe's natural, cultural and economic resources. The potential for more or fewer reservoir drawdowns for drum gate maintenance will impact positively or negatively the Tribe's fishery, Two Rivers Marina, bank stabilization, water quality, and cultural resources to just name a few.	The Preferred Alternative for the Project does not include changes in reservoir operations or drawdowns. We are proposing to complete this Project without changes to operations to avoid any effects to cultural resources as a result of reservoir operations, hydrology, water quality, and fisheries.
Include a review to ensure the safe passage of juvenile fish.	Fish passage is outside the scope of this Project. We are proposing to modernize the power production components at this time while not changing operations.
Reclamation needs to ensure that whatever refurbishment technology and design it utilizes, includes a juvenile fish passage component.	Fish passage is outside the scope of this Project. We are proposing to modernize the power production components at this time while not changing operations.

Comment	Reclamation Response
The Spokane Tribe's Department of Natural Resources expects Reclamation to honor its trust obligations to protect the Tribe's resources at every stage of this process and the larger Grand Coulee Dam refurbishment, maintenance and modernization process over the coming years.	Reclamation will continue to honor our trust obligations to STOI.
My concern is the speed the trucks will travel up and down the road (past experience), which caused the dust and ground movement and noise.	Traffic and impacts associated with traffic for the different alternatives are analyzed in the environmental assessment. It should be noted that the powerhouses must be overhauled and modernized, and increased traffic associated with that work cannot be completely avoided.
Concerned about the noise level of the equipment at the third powerhouse.	Concern noted.
I would like to see the Project completed in the least amount of time, prefer option "B".	Support noted.
Any and all modernization of the Left and Right power generators will have an adverse effect on the CBP's power rate due to both the increased cost of capital investments and decreased generation.	The proposed work has been forecasted and included within the power rate. Reclamation is bundling the planned work and associated outages into this Project to minimize untimed work, subsequent outages, and associated cost impacts.
Some modernizations included in this scope have already been included in the John Keys Pump Generation modernization plan. i.e., iso-phase bus and station service.	The iso-phase bus work and station service generators proposed are related to the LPH and RPH. Decoupling the John W. Keys III Pump-Generating Plant from the LPH was considered as one of the alternatives in the John W. Keys III Pump Generating Plant Modernization NEPA document and as such, the NEPA document did include some proposals for the iso-phase bus and station service generator work described. That alternative was not chosen for implementation within the John W. Keys Pump Generating Plant Modernization NEPA. Therefore, the iso-phase but work is being analyzed as part of the alternatives for the G1-G18 Project.

Comment	Reclamation Response
Replacement of the nine overhead cranes is unrealistic, unneeded and uneconomical.	As noted within the request for public comment, the G1-G18 project calls for replacement or refurbishment of the existing nine cranes servicing the powerhouses. Each set of cranes will be individually evaluated and a determination will be made for replacement or refurbishment.
My suggestion is Alternative B. Alternative B would provide a more even work force into the area.	Support noted.
The area needs someone in the Reclamation operation to work with the local area city councils, Chamber, Chamber Economic Development Committee, school system and real estate people and more.	Thank you for your comment. Your concern and suggestion have been noted.
I would like to recommend that Reclamation assign someone to work with the local Economic Development Council to make the economics in this area better for all.	Thank you for your suggestion.
We would like to join Reclamation in encouraging local living in the area. Perhaps Reclamation could buy up the old houses and fix them up to be decent contract working digs or even be reasonable quality rentals for employees only. I would love to see at least 150 (estimated current commuters) new families living here and patronizing the local businesses.	Thank you for your suggestions regarding housing in the area. We are not proposing at this time to build housing for workers.
I would like to express my support for the upgrades proposed to the two powerhouses, cranes, and support infrastructure at the Grand Coulee Dam.	Support noted.

4.3 Follow-up Activities

Reclamation addressed the public comments received during scoping in the EA, as indicated in Table 17. The public, CTCR, STOI, and agencies continued to be engaged by Reclamation throughout the EA preparation process.

4.4 Draft Environmental Assessment

4.4.1 Public Review

The Draft EA was released to the public on April 13, 2017, for a 30-day comment period that ended on May 14, 2017. Seventeen comments were received from WDFW (seven), GCDSD (five), STOI (four), and a private individual (one). The comment letters are included in Appendix E. The Appendix also includes Reclamation's response to public comments and the actions taken in the Final EA, based on those responses.

4.4.2 Tribal Consultation

Reclamation sent letters to the STOI and CTCR notifying them that the Draft EA was available for review and comment. In addition, the Project was discussed in meetings. Reclamation received comments from the STOI regarding the Draft EA. Reclamation's response is included in Appendix E, and the EA was edited to address comments where appropriate. Many of the comments from the STOI focused on the discussion of how this Project intersects with potential future maintenance projects at Grand Coulee, such as drum gate overhaul, and the EIS for Columbia River Systems Operations. Both of these projects were added to Section 1.10. If Reclamation proposes drum gate overhaul (subject to ongoing studies at Grand Coulee regarding safety and feasibility), overhaul and modernization would be considered under cumulative effects. In the case of the EIS, this Project may be listed in ongoing actions at Grand Coulee, and potentially may be included in cumulative effects depending on resource analysis and environmental consequences. Because Reclamation is not proposing to change operations, this Project does not impact operations at Grand Coulee or elsewhere in the system.

The STOI also commented on provisions under the Northwest Power Act. The Project will not limit the future potential for reintroduction of salmon or modifications for passage. More information regarding the ongoing salmon studies is included in Reclamation's response to the STOI in Appendix E.

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Washington State Department of Labor and Industries 2017	Washington State Department of Labor and Industries. 2017. Prevailing Wage Rates for Public Works Contracts – Journey Level Rates. Internet site: https://fortress.wa.gov/lni/wagelookup/prvWagelookup.aspx. Accessed on March 1, 2017.
Washington State Employment Security Department 2016	Washington State Employment Security Department. 2016. Labor Market County Profiles. Available at: https://www.esd.wa.gov/labormarketinfo/county-profiles. Accessed on March 9, 2017.
Washington State Office of Financial Management 2016	Washington State Office of Financial Management. 2016. Historical estimates of April 1 population and housing for the state, counties, and cities. Available at: http://www.ofm.wa.gov/pop/april1/hseries/default.asp. Accessed on March 9, 2017.
WSDOT 2015	Washington State Department of Transportation in cooperation with the United States Department of Transportation Federal Highway Administration. 2015. 2015 Annual Traffic Report, http://www.wsdot.wa.gov/mapsdata/travel/pdf/Annual_Traffic_Report_2015.pdf (p. 144)
WSDOT 2016	Washington State Department of Transportation. 2016. Officer Reported Crash Data in the Vicinity of Specific Intersections in the City of Coulee Dam & Douglas, Grant and Okanogan Counties 01/01/2011 - 12/31/2015, provided by Julie Brown, WSDOT Crash Data and Reporting Branch. November 16.

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Appendix A Scoping Notices, Letters, and Mailing Lists and Scoping Comments

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Grand Coulee Power Office
P.O. Box 620
Grand Coulee, WA 99133-0620

IN REPLY REFER TO:

GCPO-1000
1.1.2

Subject: Request for Public Comments Regarding the Proposed Grand Coulee G1-18 Modernization and Overhaul Project

Dear Interested Party:

The Bureau of Reclamation (Reclamation) is preparing an Environmental Assessment (EA) for the proposed Grand Coulee G1-G18 Modernization and Overhaul Project and is requesting public comment and agency input to help identify issues to be addressed in the EA. Information obtained during the Oct. 7 through Nov. 7 scoping period will help in the development of the EA. A draft EA is scheduled to be available for review early in 2017, at which time comments on the draft EA will be accepted. The final EA will be completed thereafter.

PURPOSE AND NEED

Reclamation proposes to modernize and overhaul the G1-G18 generating units in the Left and Right Powerhouses (LPH and RPH). The generating units began service between 1941 and 1949 and are starting to have mechanical problems from age-related wear and design on the principle components. In particular, the identified units show problems that require more frequent maintenance, increasingly challenging repairs, and longer down times. Consequently, there has been an increase in forced outages and reduced reliability. Also, the overhead cranes servicing the dam and the powerhouses need to be updated or replaced to ensure they continue to meet the needs and demands of work on the powerhouses.

The project scope includes:

- new generator windings and stator cores for the main unit generators
- new static digital excitation systems
- digital governor control systems
- local unit controls and generator relay protection systems
- penstock lining repair or replacement
- replacement or modernization of the nine cranes servicing the powerhouses
- modernization of three Station Service Generators in the LPH
- replacement or refurbishment of the iso-phase bus and circuit breakers

PROPOSED ALTERNATIVES

Reclamation is currently investigating the potential alternatives identified below.

Alternative A: No Action

Reclamation would continue operating generating units G1-G18 with no system improvements. The 18 units would continue generating power, and Reclamation would

perform maintenance on an as-needed basis. Units would be offline during maintenance or replacement work.

Alternative B: G1-G18 Modernization and Overhaul – Work on Two Units at a Time
Reclamation would repair and restore these machines in a timely manner to ensure reliable operation for an additional 30 years. Work is expected to begin in the spring of 2018. Reclamation anticipates the project would be completed by the end of 2029, but unforeseen circumstances (equipment breakdown, unexpected outages, delay in manufacturing, etc.) could delay completion.

Alternative C: G1-G18 Modernization and Overhaul – Work on One Unit at a Time
Reclamation would perform the same work as in Alternative B. However, this would extend the work up to 7 years, depending on speed of completion.

YOUR FEEDBACK IS REQUESTED

Please submit your comments by Nov. 7, 2016 to:

Pam Druliner, Natural Resource Specialist
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706
(208) 378-6214
pdruliner@usbr.gov

Sincerely,

Acting For

Coleman J. Smith, Jr.
Power Manager

Enclosure – Distribution List

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Grand Coulee Power Office
P.O. Box 620
Grand Coulee, WA 99133-0620

IN REPLY REFER TO

GCPO-1000
1.1.2

NOV 0 3 2016

Subject: Request for Public Comments Regarding the Proposed Grand Coulee G1-18 Modernization and Overhaul Project - Extended Comment Period

Dear Interested Party:

The Bureau of Reclamation (Reclamation) is extending the public comment period for the proposed multiyear powerplant overhaul project at two Grand Coulee Dam powerhouses. The initial 30-day comment period ended Nov. 7, however, at the public's request, it has been extended to Nov. 21. Reclamation is requesting public comment and agency input to help identify issues to be addressed in an Environmental Assessment (EA) for the proposed Grand Coulee G1-G18 Modernization and Overhaul Project. Information obtained during the scoping period will help in the development of the EA. A draft EA is scheduled to be available for review early in 2017, at which time comments on the draft EA will be accepted. The final EA will be completed thereafter.

PURPOSE AND NEED

Reclamation proposes to modernize and overhaul the G1-G18 generating units in the Left and Right Powerhouses (LPH and RPH). The generating units began service between 1941 and 1949 and are starting to have mechanical problems from age-related wear and design on the principle components. In particular, the identified units show problems that require more frequent maintenance, increasingly challenging repairs, and longer down times. Consequently, there has been an increase in forced outages and reduced reliability. Also, the overhead cranes servicing the dam and the powerhouses need to be updated or replaced to ensure they continue to meet the needs and demands of work on the powerhouses.

The project scope includes:

- new generator windings and stator cores for the main unit generators
- new static digital excitation systems
- digital governor control systems
- local unit controls and generator relay protection systems
- penstock lining repair or replacement
- replacement or modernization of the nine cranes servicing the powerhouses
- modernization of three Station Service Generators in the LPH
- replacement or refurbishment of the iso-phase bus and circuit breakers

PROPOSED ALTERNATIVES

Reclamation is currently investigating the potential alternatives identified below.

Alternative A: No Action

Reclamation would continue operating generating units G1-G18 with no system improvements. The 18 units would continue generating power, and Reclamation would perform maintenance on an as-needed basis. Units would be offline during maintenance or replacement work.

Alternative B: G1-G18 Modernization and Overhaul – Work on Two Units at a Time

Reclamation would repair and restore these machines in a timely manner to ensure reliable operation for an additional 30 years. Work is expected to begin in the spring of 2018. Reclamation anticipates the project would be completed by the end of 2029, but unforeseen circumstances (equipment breakdown, unexpected outages, delay in manufacturing, etc.) could delay completion.

Alternative C: G1-G18 Modernization and Overhaul – Work on One Unit at a Time

Reclamation would perform the same work as in Alternative B. However, this would extend the work up to 7 years, depending on speed of completion.

YOUR FEEDBACK IS REQUESTED

Please submit your comments by Nov. 21, 2016 to:

Pam Druliner, Natural Resource Specialist
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706
(208) 378-6214
pdruliner@usbr.gov

Sincerely,

Coleman J. Smith, Jr.
Power Manager

Enclosure – Distribution List

News Release RECLAMATION
Managing Water in the West

Grand Coulee Power Office
Grand Coulee, Washington

Media Contact:

Dave Walsh (208) 378-5026
dwalsh@usbr.gov

Lynne Brougher (509) 633-9503
lbrougher@usbr.gov
TTY: 711

For Release: Oct. 7, 2016

Reclamation Seeks Comments on Left and Right Powerhouse Modernization at Grand Coulee Dam

GRAND COULEE, Washington — The Bureau of Reclamation invites the public to comment on a proposed multiyear powerplant overhaul project at two Grand Coulee Dam powerhouses. During the 30-day comment period which ends Nov. 7, the public is encouraged to identify issues and concerns to be addressed in an Environmental Assessment on the proposed modernization and overhaul of all the generators in the Left and Right Powerhouses.

The 18 generating units and three station service units have been in operation for over 70 years and are starting to have mechanical problems from age-related wear and design. Reclamation would upgrade components of the generating units, modernize three station service generators, conduct maintenance of the penstocks, and update or replace the overhead cranes.

The Environmental Assessment alternatives are:

- Alternative A – No Action: Reclamation would continue to operate generating Units G1 – G18 with no system improvements. Maintenance would be performed on an as-needed basis.
- Alternative B – Work on Two Units at a Time: Reclamation would repair and restore the generators in a timely manner to ensure reliable operation for an additional 30 years. Work would be expected to begin in the spring of 2018 with project completion anticipated by the end of 2029. Unforeseen circumstances (equipment breakdown, unexpected outages, delay in manufacturing, etc.) could delay completion.
- Alternative C – Work on One Unit at a Time: Reclamation would perform the same work as in Alternative B. However, this alternative would extend the overhaul work up to seven years, depending on the speed of completion.

The Environmental Assessment would evaluate the impacts of each alternative on the human and natural environments. The final Environmental Assessment is expected to be published in the summer of 2017.

To submit comments, or for additional information, contact Pam Druliner, Natural Resource Specialist, Pacific Northwest Regional Office, 1150 North Curtis Road, Boise, ID 83706. Contact can also be made by emailing pdruliner@usbr.gov.

News Release RECLAMATION
Managing Water in the West

###

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 Western States. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at www.usbr.gov.

News Release RECLAMATION
Managing Water in the West

Grand Coulee Power Office
Grand Coulee, Washington

Media Contact:

Dave Walsh (208) 378-5026
dwalsh@usbr.gov

Lynne Brougher, (509) 633-9503
lbrougher@usbr.gov
TTY: 711

For Release: Nov. 4, 2016

Reclamation Extends Public Comment Period for Left and Right Powerhouse Modernization at Grand Coulee Dam

GRAND COULEE, Washington - The Bureau of Reclamation is extending the public comment period for the proposed multiyear powerplant overhaul project at two Grand Coulee Dam powerhouses. The initial 30-day comment period ended Nov. 7, however, at the public's request, it's been extended to Nov. 21. The public is encouraged to identify issues and concerns to be addressed in an Environmental Assessment on the proposed modernization and overhaul of all the generators in the Left and Right Powerhouses.

The 18 generating units and three station service units have been in operation for over 70 years and are starting to have mechanical problems from age-related wear and design. Reclamation would upgrade components of the generating units, modernize three station service generators, conduct maintenance of the penstocks, and update or replace the overhead cranes.

The Environmental Assessment alternatives are

- Alternative A – No Action: Reclamation would continue to operate generating Units G1 – G18 with no system improvements. Maintenance would be performed on an as-needed basis.
- Alternative B – Work on Two Units at a Time: Reclamation would repair and restore the generators in a timely manner to ensure reliable operation for an additional 30 years. Work would be expected to begin in the spring of 2018 with project completion anticipated by the end of 2029. Unforeseen circumstances (equipment breakdown, unexpected outages, delay in manufacturing, etc.) could delay completion.
- Alternative C – Work on One Unit at a Time: Reclamation would perform the same work as in Alternative B. However, this alternative would extend the overhaul work up to seven years, depending on the speed of completion.

The Environmental Assessment would evaluate the impacts of each alternative on the human and natural environments. The final Environmental Assessment is expected to be published in the summer of 2017.

To submit comments, or for additional information, contact Pam Druliner, Natural Resource Specialist, Pacific Northwest Regional Office, 1150 North Curtis Road, Boise, ID 83706. Contact can also be made by emailing pdruliner@usbr.gov.

###

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 Western States. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at www.usbr.gov.

Honorable Maria Cantwell
United States Senator
W. 920 Riverside, #697
Spokane, WA 99201

Honorable Patty Murray
United States Senator
10 North Post Street, Suite 600
Spokane, WA 99201

Honorable Dan Newhouse
House of Representatives
3100 George Washington Way #135
Richland, WA 99354

Honorable Cathy McMorris Rodgers
House of Representatives
555 South Main Street
Colville, WA 99114

Honorable Brian Dansel
Washington Senate
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Spokane, WA 99218

Honorable Linda Evans Parlette
Washington Senate
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Olympia, WA 98504

Honorable Judy Warnick
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Honorable Cary Condotta
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Honorable Joel Kretz
Washington House of Representatives
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Honorable Matt Manweller
Washington House of Representatives
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Honorable Shelly Short
Washington House of Representatives
P.O. Box 184
Republic, WA 99116

Honorable Scott M. Hutsell
Lincoln County Commissioner, District 2
P.O. Box 28
Davenport, WA 99122

Honorable Steve Jenkins
Douglas County Commissioner, District 3
P.O. Box 747
Waterville, WA 98840

Honorable Sheilah Kennedy
Okanogan County Commissioner, District 1
123 Fifth Ave. North, Room 150
Okanogan, WA 98840

Honorable Richard Stevens
Grant County Commissioner, District 1
Grant County Courthouse
P.O. Box 37
Ephrata, WA 98823

Honorable Gail Morin
Mayor of the Town of Elmer City
P.O. Box 1179
Elmer City, WA 99124

Honorable John Nordine
Mayor of the City of Electric City
P.O. Box 130
Electric City, WA 99124

Honorable Paul Townsend
Mayor of the City of Grand Coulee
P.O. Box 180
Grand Coulee, WA 99133-0180

Honorable Greg Wilder
Mayor of the Town of Coulee Dam
300 Lincoln Ave.
Coulee Dam, WA 99116

Honorable Carol Evans
Chairwoman
Spokane Tribe of Indians
P.O. Box 100
Wellpinit, WA 99040

Honorable Michael Marchand
Chairman
Confederated Tribes of the Colville Reservation
P.O. Box 150
Nespelem, WA 99155

Ms. Debra Wulff
Superintendent
Colville Agency
Bureau of Indian Affairs
P.O. Box 11
Nespelem, WA 99155-0111

Mr. Dan Foster
Superintendent
Lake Roosevelt National Recreation Area
1008 Crest Drive
Coulee Dam, WA 99116
Mr. Paul Turner
Superintendent
Lake Roosevelt School District Office
110 Stevens Avenue
Coulee Dam, WA 99116

Mr. Maurice Balcom, Jr.
President
South Columbia Basin Irrigation District
P.O. Box 1006
Pasco, WA 99301

Mr. Mark Booker
President
East Columbia Basin Irrigation District
P.O. Box E
Othello, WA 99344

Mr. John Rylaarsdam
President
Quincy-Columbia Basin Irrigation District
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Mr. Scott Hunter
Editor
The Star Newspaper
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Grand Coulee, WA 99133

Mrs. Peggy Nevismal
Director
Grand Coulee Dam Area Chamber of Commerce
306 Midway Ave.
Grand Coulee, WA 99133

Ms. Margie Hall
Executive Director
Lincoln County Economic Development Council
P.O. Box 1304
Davenport, WA 99122

Mr. Charles Lee
Washington Department of Fish and Wildlife
22315 North Discovery Place
Spokane Valley, WA 99216-01566

Druliner, Pam <pdruliner@usbr.gov>

Colville Tribe's Scoping Comments on Grand Coulee G1-G18 Modernization and Overhaul Project

2 messages

Joshua Osborne-Klein <joshok@ziontzchestnut.com> Mon, Nov 21, 2016 at 4:55 PM
To: "pdruliner@usbr.gov" <pdruliner@usbr.gov>

Ms. Druliner,

Please accept the attached scoping comments on the proposed Grand Coulee G1-G18 Modernization and Overhaul Project, which I am submitting on behalf of the Confederated Tribes of the Colville Reservation.

Thank you,

Joshua Osborne-Klein

Ziontz Chestnut, Attorneys at Law

2101 Fourth Avenue, Suite 1230

Seattle, Washington 98121

Phone: (206) 448-1230 x 112

Fax: (206) 448-0962

Email: joshok@ziontzchestnut.com

Attorney for the Confederated Tribes of the Colville Reservation

CCTGrandCouleeG1G18.pdf
182K

Joshua Osborne-Klein <joshok@ziontzchestnut.com> Mon, Nov 21, 2016 at 5:00 PM
To: "pdruliner@usbr.gov" <pdruliner@usbr.gov>

Also, here is the attachment that is referenced in the Colville scoping letter that was just submitted.

Thanks again,

Joshua Osborne-Klein

Ziontz Chestnut, Attorneys at Law

2101 Fourth Avenue, Suite 1230

Seattle, Washington 98121

Phone: (206) 448-1230 x 112

Fax: (206) 448-0962

Email: joshok@ziontzchestnut.com

Attorney for the Confederated Tribes of the Colville Reservation

---

From: Joshua Osborne-Klein
Sent: Monday, November 21, 2016 3:55 PM
To: 'pdruliner@usbr.gov' <pdruliner@usbr.gov>
Subject: Colville Tribe's Scoping Comments on Grand Coulee G1-G18 Modernization and Overhaul Project

[Quoted text hidden]

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786K

The Confederated Tribes of the Colville Reservation
Colville Business Council (509) 634-2200
P.O. Box 150, Nespelem, WA 99155 FAX: (509) 634-4116

November 21, 2016

Pam Druliner
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706
pdruliner@usbr.gov

Sent by email only

Re: Confederated Tribes of the Colville Reservation's Scoping Comments on the Proposed Grand Coulee G1-G18 Modernization and Overhaul Project

Dear Ms. Truliner,

The Confederated Tribes of the Colville Reservation ("Colville") provides the following scoping comments on the proposed Grand Coulee G1-G18 Modernization and Overhaul Project ("Project").

1. Background

Colville is a federally recognized Indian tribe that occupies the Colville Indian Reservation—1.4 million acres of land and water in north central Washington State. The Reservation is bounded to the west by the Okanogan River, and to the south and east by the Columbia River. Since time immemorial, members of the 12 original tribes that constitute Colville—the Chelan, Colville, Entiat, Lakes, Methow, Moses-Columbia, Nespelem, Nez Perce, Okanogan, Palus, Sanpoil, and Wenatchi—have relied on fisheries in the Columbia River and its tributaries to meet their subsistence and ceremonial needs.

On August 30, 1935, Congress authorized the construction of Grand Coulee Dam ("GCD") on a portion of the Columbia River within the Colville Reservation. 49 Stat. 1028. To facilitate construction, in 1940, Congress instructed the Secretary of the Interior to acquire lands along the Columbia River within the Colville Reservation and Spokane Indian Reservation up to an elevation of 1,310 feet above sea level to be used for "reservoir purposes." 16 U.S.C. §§ 835d-835h (hereinafter "1940 Act").

As a result of construction of GCD and inundation of Colville lands, many Colville tribal members were displaced, whole towns within the Colville Reservation were either abandoned or relocated, and numerous culturally and archaeologically significant sites were lost. In addition, completion of GCD terminated the salmon fisheries on the Columbia River and its tributaries

upstream of GCD, which had historically been an extremely important source of nourishment and cultural identity for Colville members. *See generally* NPS Administrative History (2002).[1]

2. 181-D Payments

Colville was not fully compensated for the loss of lands resulting from the construction of GCD. Accordingly, Colville filed suit against the federal government for violating the "Fair and Honorable Dealings" clause of the Indian Claims Commission Act, 60 Stat. 1049. This claim, numbered 181-D, was ultimately resolved by a settlement agreement between Colville and the Bonneville Power Administration ("BPA"), under which BPA agreed to make a lump sum payment to Colville as well as annual payments to Colville to compensate Colville for the ongoing use of Colville lands for the generation of electric power. Congress ratified the settlement agreement in 1994. P.L. 103-536 (Apr. 16, 1994).

The settlement agreement between Colville and BPA is attached to this letter. Pursuant to the agreement, the annual 181-D payment is primarily based on two factors—the amount of power generated at GCD for the year, and the change in the BPA power price for the year. *See* Settlement Agreement, § 2.b.1. Accordingly, any change to the operation of GCD that affects power generation or BPA's power price has the potential to affect Colville's annual payment, which Colville members rely on as an important party of their annual income.

Colville calls on the Bureau of Reclamation to analyze the direct, indirect, and cumulative effects of the Project on the annual 181-D payment, including impacts resulting from decreased power generation during work to modernize and overhaul the G1-G18 generating units, as well as any effects resulting from operation of the modernized units.

3. Resident Fish

Pursuant to the 1940 Act, Colville maintains paramount fishing, hunting, and boating rights in the portion of Lake Roosevelt within the Colville Reservation. In order to exercise the reserved fishing right, Colville has devoted considerable resources towards establishing rainbow trout and kokanee fisheries in Lake Roosevelt to replace the historic anadromous fisheries that were lost to GCD.

Any change to the operation of GCD has the potential to adversely affect Colville's resident fish populations in Lake Roosevelt. These rainbow trout and kokanee populations can be impacted in numerous ways, including from lake level changes, changes in water temperature, reductions in available food, deterioration or loss of habitat, and entrainment through Grand Coulee Dam.

Colville requests that the Bureau analyze the direct, indirect, and cumulative effects of construction and operation of the Project on resident fish populations in Lake Roosevelt.

4. Other Concerns

In addition to the issues discussed above, Colville is concerned that the Project could adversely affect cultural resources, including important cultural sites on and near the banks of Lake Roosevelt. Colville is also concerned that the Project could adversely affect anadromous fish in downstream reaches of the Columbia River and impact the outmigration of juvenile

[1] *Available at* https://www.nps.gov/parkhistory/online_books/laro/adhi/adhit.htm.

salmon if fish passage and reintroduction of anadromous fish above Grand Coulee Dam is implemented as called for by the 2014 Fish and Wildlife Program of the Northwest Power and Conservation Council.

Colville accordingly calls on the Bureau to analyze whether the Project will have any direct, indirect, or cumulative impacts on cultural resources, anadromous fish, and future anadromous fish passage at GCD.

* * *

Thank you for the opportunity to submit scoping comments on the Grand Coulee G1-G18 Modernization and Overhaul Project. If you have any questions regarding this letter, please contact Sheri Sears at (509) 634-2118.

Sincerely,

Dr. Michael E. Marchand, Chairman
Colville Business Council

SETTLEMENT AGREEMENT

Between the Confederated Tribes of the Colville Reservation and The United States of America

The Confederated Tribes of the Colville Reservation, consisting of the Tribes of the Colville, Lake, Sanpoil, Nespelem, Okanogan, Methow, Columbia, Wenatchee, Chelan, Entiat, Palus, and Joseph's Band of the Nez Perce Indians, are the plaintiffs in Docket 181-D of the Indian Claims Commission, which has been transferred by various acts of Congress to the United States Court of Federal Claims. The United States has recognized the Confederated Tribes of the Colville Reservation as the governing body of the plaintiff tribes. The Confederated Tribes of the Colville Reservation are hereafter referred to as the Tribe.

The Defendant in this action is the United States.

The claim asserts the entitlement of the Tribe under the "Fair and Honorable Dealings" clause and other clauses of the Indian Claims Commission Act to payment for use of reservation lands for the production of power by the Grand Coulee Dam.

1. It is hereby agreed between the Tribe and the United States through the Department of Justice and the Bonneville Power Administration (BPA) and with the support of the Department of the Interior, to settle Docket 181-D upon the terms stated herein, contingent upon enactment of enabling legislation (The Settlement Act) approving and ratifying this Settlement Agreement. The parties agree to work together and to use their best efforts to see that each step is accomplished as quickly as possible so as to meet the time schedule set forth in this agreement.

-DEFINITIONS-

a. The term "BPA power sales revenue" means all BPA revenue for the fiscal year from the sale of electric power and transmission of such power. BPA Power Sales Revenue does not include revenue from wheeling (i.e., the transmission of electric power not marketed by BPA) or from miscellaneous services not associated with the sale or delivery of power.

b. The term "BPA power sales price" means the ratio of BPA power sales revenue for a fiscal year divided by BPA power sales for such fiscal year measured in megawatt-hours.

c. The term "BPA price escalator" means the ratio of the BPA power sales price for a fiscal year divided by the BPA power sales price for FY95, taken to six decimal places.

d. The term "CPI escalator" means the ratio of the Consumer Price Index (for all urban consumers as published by the Bureau of Labor Statistics) for the September ending the fiscal year to the Consumer Price Index for September 1995, taken to six decimal places.

e. The term "combined escalator" means the average of the BPA price escalator for the fiscal year and CPI escalator for the fiscal year.

f. The term "Grand Coulee generation" means Grand Coulee total generation less generation reserved for use at Grand Coulee Dam.

-PROSPECTIVE PAYMENTS-

2. The Bonneville Power Administration, or any successor thereto that markets Grand Coulee generation, shall be authorized and required by the Act of Congress (Settlement Act) to make annual payments to the Tribe as set forth below.

a. The first annual payment, covering BPA fiscal year 1995, shall be in the amount of $15.25 million paid by BPA to the Tribe no later than March 1, 1996.

b. Not later than March 1 of each succeeding year, BPA shall pay to the Tribe for the preceding BPA fiscal year a sum computed as follows:

(1) The FY95 annual payment of $15.25 million and Grand Coulee Dam's 50 water-year computer simulated average annual generation of 20,410,800 MWh establishes a "base price" of 0.747153 mills/kWh calculated as $15.25 million divided by 20,410,800. For each fiscal year subsequent to FY95, a "base annual charge" shall be calculated equal to the base price multiplied by the BPA price escalator for the fiscal year multiplied by Grand Coulee generation for the fiscal year.

(2) There are hereby established a "floor price" of 0.661414 mills/kWh and a "ceiling price" of 0.832892 mills/kWh. For each fiscal year subsequent to FY95, a "floor annual charge" shall be calculated as the floor price multiplied by the combined escalator for the fiscal year multiplied by Grand Coulee generation for the fiscal year. Also for each fiscal year subsequent to FY95, a "ceiling annual charge" shall be calculated as the ceiling price multiplied by the combined escalator for the fiscal year multiplied by Grand Coulee generation for the fiscal year.

(3) The annual payment for a fiscal year shall be the base annual charge, except that if the base annual charge is less than the floor annual charge then the annual payment will be the floor annual charge, and if the base annual charge is greater than the ceiling annual charge then the annual payment will be the ceiling annual charge.

c. BPA shall make available to the Tribe at the time of payment its computation of the amount paid, and at the Tribe's request will make available to the Tribe such other information as may reasonably be requested by the Tribe to verify the computation.

d. In the event that the computed annual payment for any fiscal year is less than $15.25 million, the Tribe shall have the option to take a payment of $15.25 million in lieu of the computed amount. Should the Tribe exercise this option, the difference between $15.25 million and the computed amount shall constitute a loan from BPA to the Tribe. The amount of the loan shall be debited to an account held by BPA and, for the time period during which the loan is outstanding, shall accrue interest at a rate equal to the average of each month's weighted average cost of debt for all of BPA's borrowing with a term of more than one

year or, if there are no such borrowings, then at the rate paid by the United States on 1-year notes for the period in question. Repayment of the loan with accrued interest may be made at any time at the Tribe's option. However, if in any subsequent fiscal year the computed annual payment exceeds $15.25 million, the loan balance, including accrued interest, shall be deducted from the annual payment and credited against the account established herein. If, after this deduction, the recomputed annual payment is less than $15.25 million, the Tribe shall have the option to take a payment of $15.25 million. Should the Tribe exercise this option, the difference between the recomputed annual payment and $15.25 million shall remain as a debit to the account established herein and shall continue to accrue interest at the rate stated herein. The Tribe shall have no obligation to repay any loan allowed under this section except from the proceeds of future annual payments that in any year exceed $15.25 million.

IN WITNESS WHEREOF the parties hereto have executed the Proposed Settlement Agreement on the date and at the place shown below.

-PAST PAYMENT-

3. Within 15 days after (and contingent upon) enactment of the Settlement Act, the Tribe and the United States will file with the United States Court of Federal Claims a copy of this Agreement, the Settlement Act, and such papers as are necessary for entry of a compromise judgment in the amount of $53 million to settle the past payment element of this claim. Enactment of the Settlement Act and payment of that judgment will be a full and final resolution of all claims that were or could have been brought in Docket No. 181-D, excluding post judgment interest. The referenced judgment shall be paid from the funds appropriated pursuant to 31 U.S.C. 1304 and shall not be reimbursable by BPA.

Acting Assistant Attorney General

4. The Tribe shall pay out of the funds described in paragraphs two and three above such attorneys fees and expenses as it has agreed to pay under contracts approved by the Secretary of the Interior or his duly authorized agent.

ADMINISTRATION

Place

-AGREEMENT EFFECTIVE-

Date

Randall W. Hall

5. This Settlement Agreement shall become effective upon signature by the United States and Tribes as follows:

a. For the United States by a duly authorized representative of the

Department of Justice of the United States, by the Administrator of the Bonneville Power Administration, and with the concurrence of a duly authorized representative of the Department of the Interior.

b. For the Tribe by the Chairman of the Confederated Tribes of the Colville Reservation, authorized by a resolution of the Colville Business Council and a majority vote of a General Meeting of the membership of the Confederated Tribes of the Colville Reservation held for that purpose or by referendum, as determined by the Tribes. The general meeting of the membership, or referendum, shall be held after receipt of a letter of commitment to the proposed terms of this agreement from the Department of Justice on behalf of the federal signatories shown below.

IN WITNESS WHEREOF, the undersigned have executed this Proposed Settlement Agreement on the dates and at the places shown below.

UNITED STATES BY:

Washington, D.C.
Place

April 21, 1994
Date

DEPARTMENT OF JUSTICE

Lois J. Schiffer
Acting Assistant Attorney General
Environment & Natural Resources Div.

Wash. D.C.
Place

4/21/94
Date

BONNEVILLE POWER ADMINISTRATION

Randall W. Hardy
Administrator

Washington DC
Place

DEPARTMENT OF THE INTERIOR

April 21, 1994
Date

John D. Leshy
Solicitor

CONFEDERATED TRIBES OF THE COLVILLE RESERVATION BY:

Nespelem, Wn.
Place

4/16/94
Date

Eddie Palmanteer, Jr.
Chairman
Colville Business Council

CERTIFICATION

This is to certify that (1) I attended, and along with my staff, monitored the vote to approve the Grand Coulee Settlement (1994-0) held and conducted at a general membership meeting on April 16, 1994 at Nespelem, Washington on the Colville Indian Reservation; and (2) that the vote at that meeting was conducted in the manner and [illegible] the procedures set out in Resolution No. 1994-44 of the Colville Business Council in a proper and regular fashion after adequate notification to the tribal membership. A total of [illegible] votes were cast. I observed the canvassing of the ballots cast and hereby certify that a majority of those voting at the general membership meeting voted in favor of the settlement as set-out in the above tabulation. All ballots are being kept at the Colville Indian Agency of the Bureau of Indian Affairs in the custody of the Superintendent

Dated this 26th day of April 1994.

Superintendent
Colville Indian Agency

Druliner, Pam <pdruliner@usbr.gov>

STOI Comments on GCD Turbines

1 message

Billy Joe Kieffer <bjk@spokanetribe.com> Thu, Nov 17, 2016 at 5:19 PM
To: "pdruliner@usbr.gov" <pdruliner@usbr.gov>
Cc: Carol Evans <carole@spokanetribe.com>, Ted Knight <tedk@spokanetribe.com>, Brent Nichols <bnichols@spokanetribe.com>

Pam,

Please accept these comments on the Grand Coulee G-1-18.

If you have any questions please contact me.

Thanks

B.J. Kieffer - Director

Department of Natural Resources

Spokane Tribe of Indians

PO Box 480

Wellpinit, Wa 99040

bjk@spokanetribe.com

(509) 626-4427

STOI DNR Comments of GCD on alternatives for Turbines 11172016.pdf
240K

Spokane Tribal Natural Resources
P.O. Box 480 • Wellpinit, WA 99040 • (509) 626 - 4400 • fax 258 - 9600

November 15, 2016

Pam Druliner, Natural Resource Specialist
Bureau or Reclamation
1150 North Curtis Road
Boise, Idaho 83706

RE: Spokane Tribe Comments regarding the proposed Grand Coulee G-1-18 (sent via: pdruliner@usbr.gov)

Dear Ms. Druliner:

On behalf of the Spokane Tribe's Natural Resources Department (Department) please accept these comments on the Proposed Grand Coulee G1-18 Modernization and Overhaul Project. The Bureau of Reclamation's (BOR) letter requested that interested parties submit issues and concerns associated with the proposal. Given the general nature of the letter, the Department is providing BOR with a list of potential issues and concerns that it would like to see addressed in BOR's National Environmental Policy Act (NEPA) process for this project.

- In November of 2015 the Department submitted comments on the proposed Drum Gate Maintenance Schedule. The Drum Gate Maintenance Structure is part of the overall updating and maintenance projects for Grand Coulee Dam, including this G-1-18 Modernization and Overhaul Project. BOR should consider all of the projects at the same time that will likely be included in this updating and maintenance process to ensure two potential issues are properly addressed. One, BOR should consider these planned projects as a whole to avoid any potential segmentation issues that could arise under NEPA. Two, given the potential scope of this work and other work planned, BOR must ensure that its obligations under 16 U.S.C. Section 839b(h)(11)(A)(i)&(ii) are addressed. These combined projects will modernize Grand Coulee Dam and should include studies and potential modifications and additions that address fish passage and reestablishment measures outlined in the NPCC 2014 Fish and Wildlife Program, and those same reintroduction considerations that will be part of the CRSO EIS process. In short, the Dam should be modernized for a future with anadromous fish occupying the habitats above Grand Coulee Dam.

- This project along with other maintenance and modernization projects at Grand Coulee Dam will expend significant funds. Accordingly, BOR must "exercise such responsibilities consistent with the purposes of this chapter [Northwest Power Act] and other applicable laws, to adequately protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, affected by such projects or facilities in a manner that provides equitable treatment for such fish and wildlife with the other purposes for which such system and facilities are managed and operated." *See* 16 U.S.C. § 839b(h)(11)(A)(i). The Department requests that BOR, as part of this process, review the 2014 Fish and Wildlife Program and develop a list of fish and wildlife actions that could be addressed at a same time as this project to ensure these funds are used in the most efficient manner possible while fulfilling all of BOR's obligations which include the protection, mitigation, and enhancement of fish and wildlife.

- Finally, this project and the other refurbishment projects at Grand Coulee will affect the Spokane Tribe's natural, cultural and economic resources. The potential for more or fewer reservoir drawdowns for drum gate maintenance will impact positively or negatively the Tribe's fishery, Two Rivers Marina, bank stabilization, water quality, and cultural resources to just name a few. Including a review to ensure the safe passage of juvenile fish. The Tribe has documented redband trout that develop signs of anadromy and are then detected down stream of Chief Joseph Dam. BOR needs to ensure that whatever refurbishment technology and design it utilizes, includes a juvenile fish passage component. Accordingly, the Department expects BOR to honor its trust obligations to protect the Tribe's resources at every stage of this process and the larger Grand Coulee Dam refurbishment, maintenance and modernization process over the coming years.

The Department hopes that these comments help BOR through this decision making process. If you have any questions, please do not hesitate to contact me at (509) 626-4427.

Sincerely,

BJ Kieffer

B.J. Kieffer
Director
Spokane Tribal Natural Resources Department

Cc: Carol Evans, Chairwoman, Spokane Tribe of Indians
Brent Nichols, Fisheries Manager, Spokane Tribe of Indians
Ted Knight, Special Legal Counsel, Spokane Tribe of Indians

Druliner, Pam <pdruliner@usbr.gov>

Comments GC G1-18

1 message

[redacted] > Mon, Nov 21, 2016 at 4:10 PM
To: "pdruliner@usbr.gov" <pdruliner@usbr.gov>
Cc: [redacted]

Pam:

I contacted you prior and asked for an extension on the comment deadline. You graciously extended until today. Thank you. I tried calling you and found that you are out until next week.

After closer review, I do not have any environmental concerns regarding the Proposed Alternatives to accomplish the project scope.

My concern is with the Project Scope itself in the following areas:

1. Any and all modernization of the Left and Right power generators will have an adverse effect on the CBP's power rate. The effects will come from both the increased cost of capital investments and decreased generation. Both factors are variable in the power rate formula.

2. Some modernizations included in this scope have already been included in the John Keys Pump Generation modernization plan. i.e. iso-phase bus and station service.

3. Replacement of the nine overhead cranes is unrealistic, unneeded and uneconomical. This was found to be the case in the Keys plant study. USBR should use lessons learned from prior out-year plans.

I am uncertain if my comments will be included in the Draft EA, however if they are not I would like to get a written response informing when/how the correct forum to voice our concerns will be offered.

Thank you for your consideration and your assistance in this process.

[redacted]

Druliner, Pam <pdruliner@usbr.gov>

Grand Coulee Dam Work

1 message

[redacted] Sun, Nov 13, 2016 at 7:09 PM
To: pdruliner@usbr.gov

To whom it may concern

My suggestion is Alternative B. I have been in the Grand Coulee Dam Area 50 years in 2017. I came into the area to work on the Third Powerplant and have seen lots of construction and contractors come and go.

Alternative B would provide a more even work force into the area. This area does not have a lot of available housing at this time and workers are commuting in and out of the area. Work could be done without constructing additional million dollars buildings that the USBR did on the last project.

People just drive into the area and don't think it would be a place to live but if they got involved they would learn it is a great place to live and raise children. This causes workers not to become involved in the community and does not help businesses in the area. Also with the low tax base because most of the land in not taxed because it belongs to the USBR or the Colville tribe.

I would like to see the top management of the USBR work closer with the local community. They also do not live in the area so have NO interest in being part of the community, The area needs someone in the USBR operation to work with the local area city councils, Chamber, Chamber Economic Development Committee, school system and real estate people and more.

I am involved in many of the community organizations and a volunteer in many such as, [redacted] and more.

[redacted]
Electric City, Wa
email: [redacted]
[redacted] yr retiree from the USBR

Druliner, Pam <pdruliner@usbr.gov>

Grand Coulee

1 message

[redacted] Sun, Nov 13, 2016 at 5:06 PM

To: pdruliner@usbr.gov

I realize that the request for public comment seems to be focused on environmental issues, likely thinking about the water and ground effect.

I'd like to bring up the housing and economic issues. I would like to recommend that the USBR assign someone to work with the local Economic Development Council, of which I am one, to make the economics in this area better for all. Having a significant amount of workers commute in, rather than live here, makes it difficult to economically maintain the area. We would like to join the USBR in encouraging local living in the area.

Perhaps USBR could buy up the old houses and fix them up to be decent contract working digs or even be reasonable quality rentals for employees only. The entire area would benefit by having income producing families living in this town. The refurbishment of homes will clean up the area and help everyone feel better about living here. It will provide badly needed housing options for employees. Another idea would be to create a retirement village which would encourage USBR retirees to move into smaller and more manageable homes in their older part of life and free up homes that they can no longer maintain.

There is a new Superintendent at the school who is working hard to change the reputation of the school. So the next thing to work on is day care and other businesses that will help to prop up the economics of this community. I am a [redacted] shop owner (and a former engineer) and would love to see at least 150 (estimated current commuters) new families living here and patronizing the local businesses.

Who would be the right person to plug into our EDC so that we can continue this dialogue.

Thanks,

[redacted]

Druliner, Pam <pdruliner@usbr.gov>

Upgrades,

1 message

[redacted] Thu, Nov 10, 2016 at 12:01 PM

To: pdruliner@usbr.gov

To Whom It May Concern:

As a resident of the Northwest and a concerned citizen I would like to express my support for the upgrades proposed to the two powerhouses, cranes, and support infrastructure at the Grand Coulee Dam. This dam generates CLEAN power for a significant portion of the country and is badly in need of upgrades to the older equipment.

Again, I would like to express my complete and wholehearted support for this vital project.

Regards,
[redacted]

Druliner, Pam <pdruliner@usbr.gov>

PUBLIC COMMENT - Proposed multi-year power plant overhaul project / 2 Grand Coulee Dam pwoershouses

1 message

[redacted] <[redacted]> Wed, Nov 23, 2016 at 12:53 PM
To: Pam Druliner <pdruliner@usbr.gov>

Ms Druliner,
Please accept my public comments as follows:

My Residence is at [redacted], WA . Residence physically located near [redacted].

My concern is the speed the trucks will travel up and down the road (past experience), which caused the dust and ground movement and noise. And the noise level of the equipment at the third power house.

I would like to see the project completed in the least amount of time, prefer option "B".

--
Any questions, please contact me at [redacted] or by email.
Regards,
[redacted]

Druliner, Pam <pdruliner@usbr.gov>

Comment: Multiyear powerplant overhaul project at two Grand Coulee Dam powerhouses

1 message

Bob Valen [redacted] Thu, Nov 17, 2016 at 10:28 AM
To: pdruliner@usbr.gov

First: I suggest Alternative B for this project.

Second: I'd like to STRONGLY encourage the USBR to address the local and regional social and economical impacts that this project will have. There will be, as there are now with the Third Powerhouse rebuild underway, many workers in our communities. A percentage of these people have elected to leave our communities everyday to live and spend elsewhere. Commuting to and from the dam worksite at the expense of the tax payer via subsidized transportation funding.

There are likely many reasons affecting one's decisions to live elsewhere. We all have that choice. The economical and social impacts felt in our local communities are **measurable** and **real** because of those choices. Certainly, we don't provide a full set of big city amenities one finds in a larger towns yet, the four towns here, all born when the dam was built during the depression, do offer a life style unique to other communities. My favorite - no traffic signal lights!

The USBR should encourage contractors and employees to "think, live and act local." There are organizations, here locally, that are willing to help change this unfortunate mindset. Ultimately, it would benefit our communities, the USBR and individuals. Movement is underway to create more housing opportunities. The regional Economical Development Committee (EDC) is active and facilitating changes on many fronts. A combined population of over 3,000 people call the Grand Coulee region home. Yet, the USBR is currently showing no interest in the communities other than a press release addressing a contract notice. We would like to see our **largest employer** involved and active. We are heavily impact by a taxing base depleted due to U.S. Department of the Interior federal properties (USBR & NPS) as well as other issues. The Payment In Lieu of Taxes (PILT) program does not help us locally, never has and unless its drastically changed, never will. So, we have large areas of property that can't be taxed and our largest employer is paying workers transportation to live elsewhere. As you can see change is needed, the impacts are substantial. I would encourage the USBR to reevaluate their Environmental Assessment - drop the word "human" and add these two words - Social and Economic. Don't pass over these real issues.

Because Grand Coulee Dam will require on going rebuilds as it continues to age, more work will be contracted in the future. More contractors and workers will be needed to facilitate those future needs and requirements. The USBR needs to reach out to the four communities and identify weaknesses that can be improved to encourage people to change the mind set and give real consideration to think, stay and act local.

Robert Valen
Commissioner and Chair, Coulee Area Park and Recreation Dist.

[redacted]

Appendix B Draft Environmental Assessment Notice of Availability Letter

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Grand Coulee Power Office
P.O. Box 620
Grand Coulee, WA 99133-0620

IN REPLY REFER TO:
GCPO-1000
1.1.2

APR 13 2017

Subject: Request for Public Comments on the Bureau of Reclamation's Grand Coulee G1- G18 Modernization and Overhaul Project Draft Environmental Assessment

Dear Interested Party:

The Bureau of Reclamation (Reclamation) has prepared a Draft Environmental Assessment (EA) for the proposed Grand Coulee G1-G18 Modernization and Overhaul Project and is seeking comments. The project involves modernizing and overhauling the G1 through G18 generating units in the Left and Right Powerhouses to continue to provide reliable operations and electrical power generation for an additional 30 years.

The project scope includes:

- new generator windings and stator cores for the main unit generators
- new static digital excitation systems
- digital governor control systems
- local unit controls and generator relay protection systems
- penstock lining repair or replacement
- replacement or modernization of the nine cranes servicing the powerhouses
- modernization of three station service generators in the LPH
- replacement or refurbishment of the iso-phase bus and circuit breakers

The Draft EA analyzes the potential environmental effects of three alternatives, including a preferred alternative:

- **Alternative A – No Action**
  Under the No Action alternative, Reclamation would continue operating generating units G1-G18 with no system improvements. The 18 units would continue generating power, and Reclamation would perform maintenance on an as-needed basis.
- **Alternative B – Grand Coulee G1-G18 Modernization and Overhaul – Work on Two Units at a Time – Preferred Alternative**

  Under this alternative, Reclamation would overhaul the 18 generating units by working on two units at a time. The work would include the bulleted activities above, and all work would progress in a coordinated manner. Reclamation anticipates that the construction portion of the project would occur from 2018 through 2029, but unforeseen circumstances (equipment breakdown, unexpected outages, delay in manufacturing, etc.) could delay completion.
- **Alternative C – Grand Coulee G1-G18 Modernization and Overhaul – Work on One Unit at a Time**
  This alternative would be similar to Alternative B, but rather than completing work on two units at a time, work would only occur on one unit at a time. This would extend the work out an additional 6 or 7 years, depending on speed of completion.

The Draft EA is available at https://www.usbr.gov/pn/programs/ea/wash/gcpowerhouse/index.html.

Please send written comments no later than May 14, 2017 to Pam Druliner, Natural Resource Specialist, Bureau of Reclamation, 1150 North Curtis Road, Boise, ID 83706 or by email to pdruliner@usbr.gov. You may also contact her for additional information or to obtain a hard copy of the Draft EA.

Sincerely,

Coleman W. Smith, Jr.
Power Manager

Enclosure – Distribution List

Honorable Maria Cantwell
United States Senator
W. 920 Riverside, #697
Spokane, WA 99201

Honorable Patty Murray
United States Senator
10 North Post Street, Suite 600
Spokane, WA 99201

Honorable Dan Newhouse
House of Representatives
3100 George Washington Way #135
Richland, WA 99354

Honorable Cathy McMorris Rodgers
House of Representatives
555 South Main Street
Colville, WA 99114

Honorable Brad Hawkins
Washington Senate
107 Irv Newhouse Building
P.O. Box 40412
Olympia, WA 98504

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P.O. Box 40600
Olympia, WA 98504

Honorable Scott M. Hutsell
Lincoln County Commissioner, District 2
P.O. Box 28
Davenport, WA 99122

Honorable Steve Jenkins
Douglas County Commissioner, District 3
P.O. Box 747
Waterville, WA 98840

Honorable Chris Branch
Okanogan County Commissioner, District 1
123 Fifth Ave. North, Room 150
Okanogan, WA 9884

Honorable Richard Stevens
Grant County Commissioner, District 1
Grant County Courthouse
P.O. Box 37
Ephrata, WA 98823

Honorable Gail Morin
Mayor of the Town of Elmer City
P.O. Box 1179
Elmer City, WA 99124

Honorable John Nordine
Mayor of the City of Electric City
P.O. Box 130
Electric City, WA 99124

Honorable Paul Townsend
Mayor of the City of Grand Coulee
P.O. Box 180
Grand Coulee, WA 99133-0180

Honorable Greg Wilder
Mayor of the Town of Coulee Dam
300 Lincoln Ave.
Coulee Dam, WA 99116

Honorable Carol Evans
Chairwoman
Spokane Tribe of Indians
P.O. Box 100
Wellpinit, WA 99040

Honorable Michael Marchand
Chairman
Confederated Tribes of the Colville Reservation
P.O. Box 150
Nespelem, WA 99155

Ms. Debra Wulff
Superintendent
Colville Agency
Bureau of Indian Affairs
P.O. Box 11
Nespelem, WA 99155-0111

Mr. Dan Foster
Superintendent
Lake Roosevelt National Recreation Area
1008 Crest Drive
Coulee Dam, WA 99116

Mr. Paul Turner
Superintendent
Lake Roosevelt School District Office
110 Stevens Avenue
Coulee Dam, WA 99116

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Secretary-Manager
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Mr. Scott Hunter
Editor
The Star Newspaper
P.O. Box 150
Grand Coulee, WA 99133

Mrs. Peggy Nevismal
Director
Grand Coulee Dam Area Chamber of Commerce
306 Midway Ave.
Grand Coulee, WA 99133

Ms. Margie Hall
Executive Director
Lincoln County Economic Development Council
P.O. Box 1304
Davenport, WA 99122

Mr. Charles Lee
Washington Department of Fish and Wildlife
22315 North Discovery Place
Spokane Valley, WA 99216-01566

News Release RECLAMATION
Managing Water in the West

Grand Coulee Power Office
Grand Coulee, Washington

Media Contact:

Lynne Brougher (509) 633-9503
lbrougher@usbr.gov

Edna Rey-Vizgirdas (208) 378-5212
ereyvizgirdas@usbr.gov

For Release: April 14, 2017

Draft Environmental Assessment Released for Proposed Modernization and Overhaul of 18 Generators at Grand Coulee Dam

GRAND COULEE, Wash. — The Bureau of Reclamation is seeking comments on the Draft Environmental Assessment (EA) for the proposed Grand Coulee Dam G1 – G18 Modernization and Overhaul Project.

The proposed project involves modernizing and overhauling the 18 generating units in the Left and Right powerhouses to provide reliable operations and electrical power generation for an additional 30 years. The 18 generating units and three station service units have been in operation for over 70 years and are experiencing mechanical problems from age-related wear and design. Reclamation would upgrade components of the generating units, modernize three station service generators, conduct maintenance of the penstocks, and update or replace the overhead cranes.

The potential environmental effects of three alternatives were analyzed in the draft EA, including a preferred alternative:

- Alternative A – No Action: Reclamation continues to operate generating Units G1 – G18 with no system improvements. Maintenance would be performed on an as-needed basis.
- Alternative B – Preferred Alternative: Work on Two Units simultaneously: Reclamation repairs and restores the generators to ensure reliable operation for an additional 30 years. Work would likely begin in the spring of 2018 with project completion anticipated by the end of 2029.
- Alternative C – Work on One Unit at a Time: Reclamation performs the same work as in Alternative B. However, this would extend the overhaul work up to seven years longer than Alternative B.

The Draft EA is available at https://www.usbr.gov/pn/programs/ea/wash/gcpowerhouse/index.html. Please send written comments no later than May 14, 2017, to Pam Druliner, Natural Resource Specialist, Bureau of Reclamation, 1150 North Curtis Road, Boise, ID 83706 or by email to pdruliner@usbr.gov. You may also contact her for additional information or to obtain a hard copy of the Draft EA.

###

Reclamation is the largest wholesale water supplier in the United States, and the nation's second largest producer of hydroelectric power. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at https://www.usbr.gov and follow us on Twitter @USBR.

Appendix C Section 106 Correspondence

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Grand Coulee Power Office
P.O. Box 620
Grand Coulee, WA 99133-0620

IN REPLY REFER TO:

GCP-1300
ENV 3.00

MAR 0 8 2016

CERTIFIED – RETURN RECEIPT REQUESTED

Dr. Allyson Brooks, Washington State Historic Preservation Officer
Department of Archaeology & Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343

Subject: G1-18 Modernization Project – Area of Potential Effects (APE)
(Tracking No. U16-05:16.01)

Dear Dr. Brooks:

Bureau of Reclamation (Reclamation) is proposing to conduct a modernization project at the Left and Right Powerhouses, which are located on either abutment (west and east sides) of Grand Coulee Dam. The purpose of this project is to replace or upgrade existing components of the plant that are exhibiting substantial age-related wear and design deficiencies, and to increase the operational reliability and flexibility of Units G1-18 at Grand Coulee Dam.

We are in the early stages of the planning process, but have sufficient design information to determine the Area of Potential Effects (APE) for this project. As you will see in the enclosure, we are considering two main action alternatives. The APE designated in the enclosed documents includes the effects of both of these options. We have also enclosed our plan for identifying historic properties in the APE. We request that you concur with the APE and the level of effort to be used in identifying historic properties as described in the enclosure. Please note that we are conducting a coordinating effort of consultation with the Confederated Tribes of the Colville (CCT) Reservation Tribal Historic Preservation Officer since the right abutment (Right Powerhouse) is on the CCT Reservation.

If you have questions about this APE or other issues related to the G1-18 Modernization Project, please contact Mr. Derek Beery, the Power Office Archeologist, at (509) 633-9233.

Sincerely,

Acting For

Coleman W. Smith, Jr.
Power Manager

Enclosure – 1

cc: please see next page

cc: Continued from previous page

Guy Moura, Tribal Historic Preservation Officer
History/Archaeology Program
Confederated Tribes of the Colville Reservation
P.O. Box 150
Nespelem, WA 99155-0150

Attachment 1 – Area of Potential Effects and Plans for Identification of Historic Properties

Overview

The United States Bureau of Reclamation (Reclamation) is considering a large overhaul and modernization project in the Left and Right Powerhouses at Grand Coulee Dam. The project seeks to modernize the aging infrastructure on and associated with units G1-18 in the two powerhouses over the next 10 or more years.

The Left and the Right Powerhouses at Grand Coulee Dam harness the hydraulic power of the Columbia River to generate electricity. Both are integral components of original Grand Coulee Dam project begun by the United States government in the 1930s. Construction of the Left Powerhouse was included as part of the initial dam authorization in 1933. The first of the service station generating units in the Left began producing electricity in 1941 and the remaining generators came online during the next several years in an urgently conducted campaign to produce power for vital war-time industries. By April of 1944 the Left Powerhouse was able to produce 952,000 kW an hour, supplying the vast power requirements of aluminum production in the Northwest and also for the secret project at Hanford.

Realization of the need for electricity to supply war production led to accelerated construction of the Right Powerhouse years ahead of the original plan. A week after the attack on Pearl Harbor a change order authorized building of the Right Powerhouse. Construction began January 1, 1942 with a planned completion late that year. Shortages of labor and materials interfered with building progress causing work on the Right Powerhouse to proceed in fits and starts. With the end of the war and a decline in power demand, completion of the powerhouse took on a secondary importance to other project work. The plant was not completed until the late 1940s, with the generating units coming on-line between 1948 and 1950.

The size of the plants and the vast amount of electrical power generated by the two original powerhouses contribute to the significance of the Grand Coulee Dam project as a landmark engineering accomplishment.

Now the power generating infrastructure inside the Left and Right Powerhouses is outdated and beginning to show the problems associated with hydropower units as they near the end of their useful lives. Grand Coulee Dam continues its historical mission of generating massive amounts of hydropower for the region. (Reclamation) needs to upgrade and modernize the Left and Right Powerhouse generators and other associated infrastructure in order to meet the electrical and irrigation needs of the American people.

Purpose and Need

The purpose of the G1-18 Modernization Project project is to replace and/or upgrade existing components of the plant that are exhibiting substantial age-related wear and design deficiencies and to increase the Left and Right Power Houses' operational reliability and flexibility. The Left

Powerhouse contains three station service generators rated at 10,000 kW and nine generators rated at 125,000 kW. The Right Powerhouse contains nine generators rated at 125,000 kW. The modernization is being considered because many of the plants' principal components are being operated far beyond their intended service life. In particular, the G-1 thru G-18 units show problems stemming from age and wear that result in increased hardware failures and forced outages, more challenging repairs due to obsolescence and lack of spare parts.

Preliminary Design Options

Reclamation has developed the following preliminary alternatives for implementation of the project.

Alternative A: No Action

If the generating units are not modernized and overhauled, O&M requirements would increase and production and reliability would decrease and the loss of revenue from interrupted public power generation would be substantial. If this decrease in production and reliability occurs, Reclamation may not be able to meet contractual obligations and historical mission for power generation.

Alternative B: G1-18 Modernization

Reclamation is considering a massive effort to modernize and overhaul generator units G-1 thru G-18 and their auxiliary systems within Left and Right Powerhouses (LPH/RPH) of the Grand Coulee Dam. The Grand Coulee G-1 thru G-18 Unit Modernization Program is a group of related projects, managed by Reclamation as a single program to increase coordination, reduce costs and decrease risk. The program scope is to include new generator windings and stator cores for fifteen (15) of the eighteen (18) main unit generators; new static digital excitation systems for all eighteen (18) main unit generators, digital governor control systems, local unit controls, unit breakers and generator relay protection systems for all eighteen (18) main unit generators; transformer replacements for several main generator units; penstock lining repair or replacement for all eighteen (18) units; replacement or modernization of the nine (9) cranes servicing the powerhouses; modernization of three (3) Station Service generators (LS-1 thru LS-3) in the LPH. Potentially during the same unit outages if determined necessary during future condition assessments, the iso-phase bus from each main unit generator to the transformer deck and the unit circuit breakers may be replaced for all eighteen (18) units.

The modernization program would include inspecting and refurbishing or replacing components. Refurbishment and repairs on the units may include, depending on need, but are not limited to replacement or repair of:

Left Power House (LPH)

Cranes

350-t Bridge Crane #1

Replace w/ New

350-t Bridge Crane #2

Replace w/ New

50-t Bedford Crane

Replace or Modernize Control Systems

LPH Top of Dam Gantry

Replace or Modernize Control Systems

Cyclops Gantry

Replace or Modernize Control Systems

Main Generator Units

G-1

Windings & Stator Core - Replacement
Floor Mounted Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-2

Windings & Stator Core - Replacement
Floor Mounted Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-3

Windings & Stator Core - Replacement
Floor Mounted Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-4

Floor Mounted Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-5

Floor Mounted Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-6

Windings & Stator Core - Replacement

Floor Mounted Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-7

Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-8

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-9

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

Station Service Units

LS-1

Windings & Stator Core - Replacement
Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System

LS-2

Windings & Stator Core - Replacement
Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System

LS-3

Windings & Stator Core - Replacement
Exciter - Replace w/ Digital Exciter Cabinets
Mechanical Governor Controls - Replace w/ Digital Control System

Right Power House (RPH)

RPH Cranes

350-t Bridge Crane #1

Replace w/ New

350-t Bridge Crane #2

Replace w/ New

RPH Top of Dam Gantry

Replace or Modernize Control Systems

Cyclops Gantry

Replace or Modernize Control Systems

Main Generator Units

G-10

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-11

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-12

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-13

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied

G-14

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System

Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-15

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-16

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-17

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

G-18

Windings & Stator Core - Replacement
Top Mounted Rotating Exciter - Replace w/ Digital Exciter Cabinets in Gallery
Mechanical Governor Controls - Replace w/ Digital Control System
Generator Protection Relays - Replace w/ Digital Relays
Unit Circuit Breakers - Replace
Isophase Bus Unit to Transformer - Replace
Penstock - Lining System Removed and New Lining Material Applied
Transformers - Replace

Other repairs may need to be performed on the generating units but due to lack of access to the units, all items in need of repair cannot be fully anticipated. The objective is to repair and restore these machines to ensure reliable operation for an additional 30 years.

Five staging areas are also being considered. Four of the five area already used as staging areas at this time. Another alternate, at North Dam, is also listed. The North Dam location has been heavily disturbed but it does not have the impervious surface and previous use as a storage area compared to the other four. These staging areas are discussed further in the APE section.

Area of Potential Effects (APE)

Based on the project description provided above, the project has the potential to result in direct physical effects to the ground surface at the staging areas. The project also has the potential to affect the built environment, especially the interiors of the Left and Right Powerhouses and the associated transformer deck and cranes for each of the two powerhouses. The project does not have the potential to result in visual effects to the surrounding viewshed as no additional equipment would be added to the exterior of the industrial complex. These three kinds of effects provide the basis for determining the APE.

APE for Ground Surface-Disturbing Activities

The APE for ground disturbing activities includes 5 potential staging areas. These five areas contain a total of roughly 35 acres in and around the Left and Right Powerhouses and two more alternatives in areas away from the main dam (Crescent Bay and North Dam Park). These areas were selected to allow for the possibility that the areas might be used for laydown areas and staging for other materials used for the project. At this point in time, no sub-surface ground-disturbing activities like grading or drainage improvements are anticipated in the laydown areas as most already contain flat, impervious surfaces suitable for immediate use as storage and staging sites.

The Five Staging Areas:

- Former Wilson Staging Area (8 acres; right bank)
- TPP Entrance Staging Area (1/2 acre; right bank)
- Lower Visitor Center Staging Area (1/2 acre; left bank)
- Crescent Bay Staging Area (6 acres; NPS Recreation Zone)
- North Dam Staging Area (20 acres; North Dam Park)

APE for Activities that Will Disturb the Built Environment

The APE for activities that might affect the built environment includes the following locations:

- Left Powerhouse Interior and the Transformer Deck
- Right Powerhouse Interior and the Transformer Deck
- Two moveable Gantry Cranes on Top of Dam
- Two Cyclops Cranes on south faces below Powerhouses-

APE for Visual Effects of the Project

No new exterior additions beyond the scope of equipment replacement on the transformer decks and the replacement or modernization of gantry and cyclops crane controls are expected. As such a visual effects APE is not included for the project.

Level of Effort to be Used to Identify Historic Properties

Archeological Resources

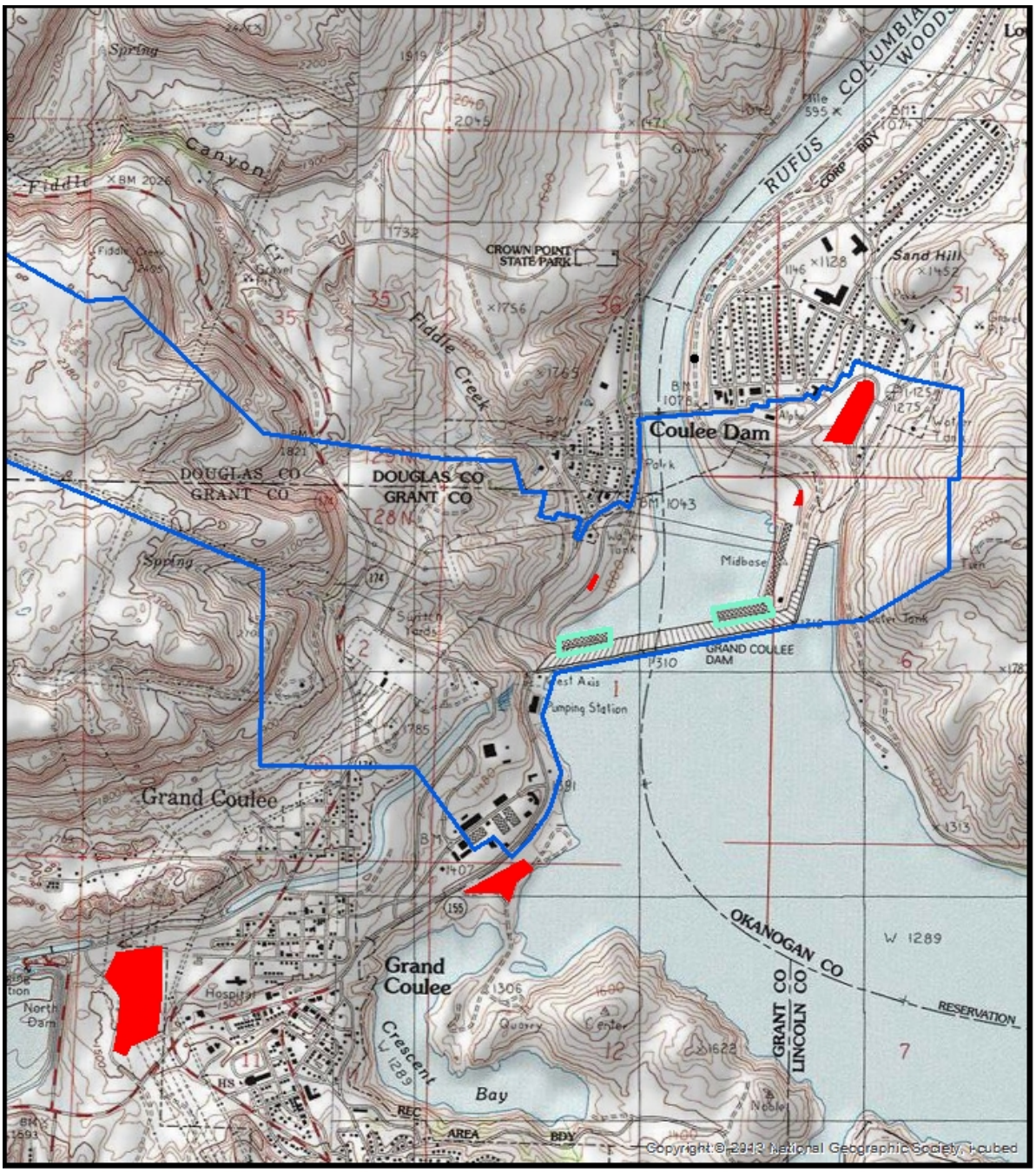
Reclamation has already reviewed the construction records on file at the Grand Coulee Power Office to determine the extent of previous disturbance in the area of direct physical effects, especially the areas at North Dam and the Wilson Staging Area. Archeological fieldwork would determine the extent of historic features in each of the staging areas but all have been heavily disturbed during dam constructions and there is no potential that use of the areas for staging will have the potential to effect prehistoric archaeological resources. Because disturbance will be to the ground surface only do to simple use of the areas for staging and storage it is not anticipated that any shovel test pits or shovel scrapes would be needed to identify archeological resources in these heavily disturbed zones. Any archeological fieldwork will be conducted by personnel who meet the Secretary of the Interior standards for a professional archeologist.

Traditional Cultural Properties

The first step in identifying historic properties of traditional religious and cultural importance to tribes or traditional cultural properties (TCPs) would be reviewing previous ethnographic studies, oral histories, and accounts of local history to determine if any such studies have covered the APE. These sources will be reviewed, and if they are sufficient, they will be used as the basis for making a determination regarding project effects. If they are not sufficient, Reclamation will work with the Confederated Tribes of the Colville Reservation to identify TCPs.

Standing Structures

In order to identify standing structures that may be considered historic properties in the APE, Reclamation will review the records of previous assessments of standing structures in the proposed project area. The Grand Coulee Dam HAER document has been recently completed and will be used as the primary reference point for project effects to historically significant character defining features of Grand Coulee Dam. The National Register eligibility of the standing structures in the APE has been determined and both the Left and Right Powerhouses are determined eligible for the National Register through an existing MOA. This consensus determination will serve as the basis for making determinations of project effects to the National Register eligible Dam and Left and Right Powerhouses and their associated infrastructures. A historian who meets the Secretary of the Interior standards will review and approve studies of the built environment to ensure that the reports comply with applicable standards.



Left Power Plant & Right Power Plant, Grand Coulee Dam

Graphic based on BOR Grand Coulee South 3 inch raster.

No warranty is made as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Spatial information may not meet National Map Accuracy Standards. This reference graphic is intended for informational purposes only.

0 250 500 750 1,000 1,250

Meters

LPP & RPP

Pot. Staging Areas

National Register District Boundary (Draft)

USGS 7.5' Quad:
Grand Coulee Dam, WA
T28N R30E Section 1
T28N R31E Section 6
T29N R30E Section 36

N

1:24,000 March 2016

RECLAMATION
Managing Water in the West

Figure 1. Project Location.

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

March 16, 2016

Mr. Coleman W. Smith Jr.
Grand Coulee Power Office
Bureau of Reclamation
PO Box 620
Grand Coulee, Washington 99133-0620

RE: G1-18 Modernization Project
Log No.: 2016-03-01750-BOR

Dear Mr. Smith:

Thank you for contacting our Department. We have reviewed the information and materials you provided for the proposed G1-18 Modernization Project at Grand Coulee Dam, Grant County, Washington.

We concur with your determination of the Area of Potential Effect (APE) as described and presented in your figures and text.

We look forward to further consultations as you undertake your identification efforts, consult with the concerned tribal governments, and provide the results of cultural resources review, and render your finalized Determination of Effect.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 890-2615
email: *rob.whitlam@dahp.wa.gov*

Appendix D Programmatic Agreement

Programmatic Agreement

Among the

Bureau of Reclamation, Grand Coulee Power Office;

Washington State Historic Preservation Officer; and the

Confederated Tribes of the Colville Reservation;

Regarding the

Grand Coulee G1-G18 Modernization Project

WHEREAS the Bureau of Reclamation (Reclamation) operates the Grand Coulee Dam and the Left and Right Powerplants (Grand Coulee) for their Congressionally authorized purposes, including power generation; and

WHEREAS Grand Coulee is a critical component of the Federal Columbia River Power System (FCRPS), providing essential hydropower generation to the national power grid; and

WHEREAS much of the generating equipment at Grand Coulee is beginning to show problems typical of power infrastructure reaching the end of its expected service life; and

WHEREAS Reclamation proposes to implement the G1-G18 Modernization Plan (undertaking) to replace and upgrade existing hydrogenerating infrastructure in order to ensure safe, environmentally sustainable, and reliable power generation operations for the long term future; and

WHEREAS the Grand Coulee Dam and associated powerplants have been determined eligible for the National Register of Historic Places through agreement between Reclamation, the Washington State Historic Preservation Officer (SHPO), and the Confederated Tribes of the Colville Reservation; and

WHEREAS Reclamation recognizes the special place of Grand Coulee Dam in the history of the Pacific Northwest and its stewardship responsibilities in making that history accessible to the public; and

WHEREAS Reclamation has considered the views of the public on the undertaking through the Final Environmental Assessment: Grand Coulee G1 through G18 Generating Units Modernization and Overhaul issued October 2017; and

WHEREAS Reclamation has already taken steps in the design of the undertaking to minimize adverse effects; and

WHEREAS Reclamation, the Washington Department of Historic Preservation and Archaeology, the Confederated Tribes of the Colville Reservation, and others agreed in 2013 to a

Systemwide Programmatic Agreement (SWPA) governing the management of historic properties for the FCRPS and which remains in effect; and

WHEREAS, in accordance with 36 CFR 800, Reclamation has consulted under Section 106 of the National Historic Preservation Act with SHPO and the Tribal Historic Preservation Officer for the Confederated Tribes of the Colville Reservation (THPO) concerning effects of the undertaking on historic properties; and

WHEREAS Reclamation has determined, in consultation with SHPO and THPO that the undertaking will not affect archeological resources or traditional cultural properties; and

WHEREAS Reclamation has determined, and SHPO and THPO have concurred, that the undertaking will, by removing significant historic features from the dam and powerhouses, diminish the historic integrity of Grand Coulee, resulting in an adverse effect to the historic property; and

WHEREAS, in accordance with 36 CFR 800.6(a)(1), Reclamation has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with the specified documentation, and the ACHP has not chosen to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and

WHEREAS the undertaking is a complex project which will occur over a period of a decade or more, for which all the effects to historic properties may not be foreseeable at the present time, and 36 CFR 800.14(b) notes that it is appropriate for a Federal agency to implement a programmatic agreement in such a circumstance;

NOW, THEREFORE, Reclamation, THPO, and SHPO agree that the undertaking shall be implemented in accordance with the following stipulations to take into account the effects of the undertaking on historic properties.

STIPULATIONS

Reclamation shall ensure that the following measures are carried out:

I. APPLICABILITY

A. This PA applies to all Reclamation activities initiated and carried out in in connection with the undertaking, including but not limited to those sub-projects identified in the EA.

B. The Area of Potential Effects (APE) covered by this agreement will be restricted to the physical limits of Grand Coulee Dam and the Left and Right Powerhouses, as documented in the 2017 Section 106 consultation with SHPO and THPO.

II. FURTHER CONSULTATION AND REVIEW

A. G1-G18 Modernization Scope and Time Frame

1. The modernization is expected to be carried out over the course of a decade or more, and will include the following actions analyzed in the existing Section 106 documentation (provided as Appendix A):

a. Replacement of the generator windings and stator cores of the main-unit generators;

b. Installation of new static digital excitation systems for all 18 main-unit generators;

c. Digital governor control systems, local unit controls, and generator relay protection systems for all 18 main-unit generators;

d. Penstock lining repair or replacement for all 18 units;

e. Replacement of nine cranes servicing the powerhouses and dam;

f. Modernization of three station service generators (LS-1 through LS-3) in the LPH;

g. Replacement or refurbishment of the iso-phase bus and circuit breakers for all 18 units.

2. In addition, it is likely that project conditions may require other work with the potential to affect historic properties, but which are not foreseen or understood at this time.

a. For activities already covered under the 2012 Final FCRPS Systemwide Programmatic Agreement, Attachment 6 "Routine Activities Under this FCRPS Systemwide PA That Do Not Require Section 106 Consultation" (included in this PA as Appendix B), Reclamation cultural resources professionals will follow the review process stipulated in that document.

b. In addition to the activities covered in Appendix B, replacement of such auxiliary equipment and features as transformers, bus work, cables, air compressors, heat exchangers, pumps, and runs of piping for service air, oil lines, water, and drainage lines will not require further Section 106 consultation..

c. New installation of control systems, fire and life safety measures, and communications equipment that do not adversely affect historic character defining features of the dam and powerplants, as assessed by Reclamation cultural resources professionals, will not require further Section 106 consultation.

d. Reclamation cultural resources professionals will review and document all projects carried out under section II.A.2 before and after work. Minimum documentation shall consist of photographs and / or drawings adequate to show the extent and effect of the work and a written historic preservation analysis.

B. Any other projects not analyzed in existing Section 106 documentation will be subject to review under 36 CFR 800. Compliance with the National Environmental Policy Act (NEPA) should be coordinated with Section 106 compliance as necessary and required.

C. Reclamation may consult informally with the SHPO and THPO regarding the implementation of this PA and means to accomplish the undertaking in a manner that minimizes effects to Grand Coulee's historic character.

III. MEASURES TO AVOID, MINIMIZE, OR MITIGATE ADVERSE EFFECTS

A. Over the period of five years from the signing of this agreement, Reclamation will develop its heritage education programs at Grand Coulee Power Office through the following activities:

1. Reclamation will sponsor a minimum of two historic preservation and rehabilitation workshops organized by the Washington State Department of Archaeology and Historic Preservation in cooperation with local communities.

2. Reclamation cultural resource and public outreach professionals will organize a recurring annual lecture series on the history of Grand Coulee at appropriate regional locations, including institutions of higher learning, local historical societies, and museums.

3. Reclamation will make available on-line to the public a collection of historic construction and operational photographs of Grand Coulee Dam and Powerhouses, as well as a selection of historic videos and films.

4. Reclamation will prepare an updated interpretive plan to comprehensively identify important historical themes and guide exhibit development and tour presentations for heritage education at Grand Coulee.

5. Reclamation will work with the Confederated Tribes of the Colville Reservation (CCT) to explore ways to jointly develop a heritage tour program. In cooperation with the CCT, Reclamation will continue to provide space for signage and literature at the Visitor Access Center in Coulee Dam promoting the Colville Tribal Museum and the Fort Okanogan Interpretive Center. Reclamation will continue to direct the public's attention to the museum during tours with a recommendation to consider visiting.

B. Crane design parameters.

1. Replacement cranes under the modernization project will be similar in general appearance and scale to the historic cranes. Cranes will be painted to match the historic colors of the existing cranes.

2. Reclamation shall submit to the SHPO and the THPO drawings, color samples, and photographs, to document the final form and colors chosen of the replacement cranes.

C. Grand Coulee Dam and Powerhouse Historic Structures Report

1. Reclamation will prepare a Historic Structures Report (HSR) covering the Grand Coulee Dam and Powerhouses. Preparation of the HSR will begin within two years of the signing of this PA.

a. The HSR will provide a comprehensive analysis of the structural systems, building envelope, and mechanical systems of the dam and powerhouses from a historic preservation perspective. The report will identify character defining architectural features, provide materials analysis for future conservation efforts, and provide a hierarchy of historic spaces. A brief sketch of the historic context

and aspects of significance will supply relevant background information for the preservation management of the complex as a working hydro-generating facility.

b. In the interests of making the HSR a usable guide for facility management, investigations will be carried out or reviewed by an interdisciplinary team of Reclamation subject matter experts. The HSR will provide long-term preservation guidance and treatment recommendations for character defining features of the Grand Coulee generating complex, including historic finishes, furnishings, lighting, and signage. The scope of the investigations and recommendations will encompass final treatment and use of the Model Dam, including investigations into the feasibility and resource requirements of rehabilitation and public accessibility.

D. Disposition of original auxiliary equipment

Some of the auxiliary equipment covered by II.A.2.b is presumed to be original to the period of construction. Based on assessment by Reclamation cultural resource professionals, significant examples of period historic equipment may be retained for curation as Reclamation museum property or for use in interpretive exhibits for heritage education programs.

1. Reclamation will ensure curation or other acceptable disposition of such equipment determined to possess historic value.

2. Equipment determined to possess historic value will be documented to HAER standards by Reclamation engineering and cultural resource staff prior to removal from its original location. Documentation will be retained as Reclamation archives.

IV. QUALIFICATION STANDARDS

All work called for in this PA shall be carried out by or under the oversight and review of a professional who meets the Secretary of the Interior's Professional Qualification Standards for archeologist, historian, or architectural historian, as appropriate to the historic property in question.

V. REPORTING

Reclamation will provide SHPO and THPO with an annual summary report of the work completed under this PA.

VI. DURATION

A. This PA will remain in effect for fifteen years from the date of final signing. The parties will review the agreement every five years from the date of signing in order to ensure effectiveness.

B. Should the performance period of the Modernization extend beyond fifteen years, this PA may be amended following the provisions of Stipulation VIII.

VII. DISPUTE RESOLUTION

Should any party object in writing to actions carried out or proposed pursuant to this PA, Reclamation shall consult to resolve the objection. If, after such consultation, Reclamation determines that the objection cannot be resolved, Reclamation will:

A. Forward all documentation relevant to the dispute, including Reclamation's proposed resolution, to the ACHP. The ACHP shall provide Reclamation with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, Reclamation shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP and signatories and provide them with a copy of this written response. Reclamation will then proceed according to its final decision.

B. If the ACHP does not provide advice regarding the dispute within the thirty (30) day time period, Reclamation may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, Reclamation shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories to the PA, and provide them and the ACHP with a copy of such written response.

C. Reclamation's responsibility to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

VIII. AMENDMENTS

Prior to expiration, this PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

IX. TERMINATION

If any of the signatories determines that the terms of this PA will not or cannot be carried out, that party shall immediately consult with the other signatories to attempt to develop an amendment as described in Stipulations VII and VIII, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories.

Once the PA is terminated, and prior to work continuing on the undertaking, Reclamation must either (a) execute a new PA pursuant to 36 CFR 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. Reclamation shall notify the signatories as to the course of action it will pursue.

X. GENERAL PROVISIONS

A. This PA is neither a fiscal nor a funds obligating document. Any endeavor will be handled in accordance with applicable laws, regulations, and procedures including those for Government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. This PA does not provide such authority.

B. Nothing herein shall be construed to obligate Reclamation to expend or involve the United States of America in any contract or other obligation for the future payment of money in excess of the appropriations authorized by law and administratively allocated for the purposes and projects contemplated hereunder.

C. No member of or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of the PA or to any benefit that may arise out of it.

D. Any information furnished to Reclamation, under this PA, is subject to the Freedom of Information Act (5 U.S.C. 552).

E. All parties to this PA agree to comply with all Federal statutes relating to nondiscrimination, including but not limited to: Title VII of the Civil Rights Act of 1964, as amended, which prohibits discrimination on the basis of race, color, religion, sex, or national origin; Title IX of the Education amendments of 1972, as amended, which prohibits discrimination of the basis of sex; the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act of 1990, as amended, which prohibit discrimination on the basis of disability; the Age Discrimination in Employment Act of 1967, as amended, which prohibits discrimination based on age against those who are at least 40 years of age; and the Equal Pay Act of 1963.

EXECUTION of this Memorandum of Agreement, together with its submission by Reclamation to the Advisory Council on Historic Preservation pursuant to 36 CFR 800.6(b)(1)(iv) and its implementation, evidences that Reclamation has taken into account the effects of the undertaking on historic properties and has afforded the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.

Primary Signatories

U.S. Bureau of Reclamation

By: Coleman W. Smith Jr. Date: 12 FEB 2018
Coleman W. Smith, Jr., Power Manager

Washington State Historic Preservation Officer

By: Date: 6/12/18
Allyson Brooks, Washington Historic Preservation Officer

Confederated Tribes of the Colville Reservation Tribal Historic Preservation Officer

By: Date: 5-11-18
Guy Moura, Tribal Historic Preservation Officer

Confederated Tribes of the Colville Reservation Business Council

By: Date: 5-15-18
Michael Marchand, Ph.D., Chairperson

Appendix E Public Comments on the Draft Environmental Assessment

Appendix E. Public Comments

This appendix presents the comment letters and e-mail received on the Draft EA. Table E-1 provides the comment submittal number and the associated author and affiliation.

Table E-1. Public Comments on the Draft Environmental Assessment

Comment Number	Comment Author / Affiliation
GCEA-STOI1 to GCEA-STOI4	B.J. Kieffer/Spokane Tribe of Indians
GCEA-WDFW1 to GCEA-WDFW7	Michael D. Garrity/State of Washington Department of Fish and Wildlife
GCEA-GCDSD1 to GCEA-GCDSD5	Paul Turner/Grand Coulee Dam School District
GCEA-PC1	Private Citizen/General Public

Comment GCEA-STOI1

(1) BOR failed to address the Columbia River System Operations Environmental Impact Statement ("CRSO EIS"). Within the EA's "Other Related Actions and Activities" section it fails to acknowledge the court ordered EIS for the FCRPS.

Comment GCEA-STOI2

On May 4, 2016 Judge Simon ordered the agencies responsible for operation of the FCRPS to conduct an EIS, which is currently underway. As an example, the CRSO public notice sent out in September of 2016 stated the following:

> The EIS will evaluate and update the Agencies' approach for long-term system operations and configuration through the analysis of different alternatives to current operations and **maintenance**; including changes to flood risk management, navigation, hydropower, irrigation, fish wildlife conservation, recreation and municipal and industrial water supply.

(Emphasis added). Accordingly, in the Tribe's scoping comments for this EA the Tribe stated the following:

> In November of 2015 the Department submitted comments on the proposed Drum Gate Maintenance Schedule. The Drum Gate Maintenance Structure is part of the overall updating and maintenance projects for Grand Coulee Dam, including this G-1-18 Modernization and Overhaul Project. BOR should consider all of the projects at the same time that will likely be included in this updating and maintenance process to ensure two potential issues are properly addressed. One, BOR should consider these planned projects as a whole to avoid any potential segmentation issues that could arise under NEPA. Two, given the potential scope of this work and other work planned, BOR must ensure that its obligations under 16 U.S.C. Section 839b(h)(11)(A)(i)&(ii) are addressed. These combined projects will modernize Grand Coulee Dam and should include studies and potential modifications and additions that address fish passage and reestablishment measures outlined in the NPCC 2014 Fish and Wildlife Program, and those same reintroduction considerations that will be part of the CRSO EIS process. In short, the Dam should be modernized for a future with anadromous fish occupying the habitats above Grand Coulee Dam.

However, instead of addressing how this significant maintenance proposal fits within the CRSO EIS, the BOR simply ignored this comment and repeatedly states that these comments are outside the scope of this Project or simply this Project will not impact current operations, therefore, it requires no analysis of impacts on fish and wildlife.

First, this runs counter to the scope of the CRSO EIS, which is to include long-term maintenance as noted above.

Comment GCEA-STOI3

Second, BOR's assumptions ignore Judge Simon's articulation of the need for the agencies that operate the FCRPS to not commit resources that could lead to bureaucratic steam rolling. *See NWF v. NMFS,* 01-00640-SI, March 27, 2017. The Department is very concerned that BOR is pushing through this maintenance project that could last longer than a decade without consideration for how this fits within the CRSO EIS.

Comment GCEA-STOI4

(2) BOR Failed to Address the Requirements of the Northwest Power Act

The Act requires that BOR "exercise such responsibilities, taking into account at each relevant stage of decision making processes to the fullest extent practicable, the program adopted by the Council under this subsection." 16 U.S.C. Section 839b(h)(11)(A)(ii). Instead of analyzing how this proposal fits within the Council's program BOR simply stated the following: "The Project will not preclude our potential to address obligations under 16 U.S.C. Section 839b(h)(11)(A)(i)&(ii) in the future." The Act requires that BOR address the Program not simply decide the project will not preclude BOR from satisfying its obligations.

Comment GCEA-WDFW1

The draft EA states that the project will not impact fisheries, water resources/hydrology, or federally protected species under either action alternative. It would be helpful to have more detail on how the project will ensure that there is no impact on water levels (or adaptive management of water levels) in Lake Roosevelt or entrainment of native or non-native fish that live in the reservoir.

Comment GCEA-WDFW2

It would also be helpful for the final EA to discuss how the action alternatives may or may not affect the potential to reintroduce anadromous fish above Grand Coulee Dam…

Comment GCEA-WDFW3

The preferred action should not delay the prospects for installing "fish-friendly" turbines at the dam, and the Bureau of Reclamation should seriously consider, with documentation of that consideration, the opportunity this project presents to install "fish-friendly" turbines.

Comment GCEA-WDFW4

Please explain the rationale for choosing not to replace or refurbish the turbines while the units are disassembled.

Comment GCEA-WDFW5

As has recently been demonstrated at Grant County Public Utility District's Wanapum Dam, fish-friendly turbines can also allow for significant increases in energy production, so they would likely be a worthy investment even under a scenario where anadromous fish reintroduction above Grand Coulee proves infeasible.

Comment GCEA-WDFW6

In addition, please address whether the action alternatives may affect potential upstream or downstream collection sites or technologies for adult or juvenile anadromous fish.

Comment GCEA-WDFW7

We urge you to choose a preferred action that does not limit potential upstream or downstream passage technologies or potential locations for those technologies.

BOR failed to address the Columbia River System Operations Environmental Impact Statement ("CRSO EIS").

Comment GCEA-GCDSD1

The District certainly supports the Bureau's continued modernization and investment efforts here.

Comment GCEA-GCDSD2

However, the Bureau needs to assist the District by ensuring funds for the additional students enrolled within the District throughout the life of this project. This financial imp act is expected to continue to occur over the 12 year life of this proposed modernization project, see id. § 2.3 (preferred alternative).

Comment GCEA-GCDSD3

An additional important aspect of this issue here too is that 60% of the District's student body is comprised of Native America n tribal members most from the Confederated Tribes of the Colville Indian Reservation and neighboring Indian tribes to whom the Bureau owes a trust responsibility. This recognized trust responsibility requires the Bureau to "take all actions reasonably necessary " to protect these interests, see id. § 1.6.5 (recognizing same), which the Colville Tribes have also historically advocated for. See Agreement with the Columbia and Colville, July 7, 188 3, 23 stat., 79. Vol. 1, p. 224 (noting request for school). This necessarily includes supporting the " national goal of the United States" to provide " the quantity and quality of educational services and opportunities [that] permit Indian children to compete and excel in the life areas of their choice, and achieve a measure of self-determination essential to their social and economic well-being," 25 U.S.C. § 450(a)(c) (Declaration of national goal). Leaving the District underfunded impedes this goal.

Comment GCEA-GCDSD4

However, because of the large amounts of federally owned lands here, the District cannot rely on funding from property taxes. *Id.* Accordinly, the District must rely on federal funding sources and contrary to a prior Bureau position, the District receives no Impact Aid funding, *see* 20 U.S.C. ch. 70, for students connected to the federally owned Grand Coulee Dam project due to the federal government's ownership of the lands associated with the project prior to the effective date of the Impact Aid legislation, *see* Feb. 6, 2012 Letter (stating same).

Comment GCEA-GCDSD5

Regarding the Draft EA's proposed modernization project here, additional student enrollment is unquestionably expected through the life of these projects and thus far the Bureau has failed to consider this growing issue.

Comment GCEA-PC1

I prefer the Bureau's recommendation two per year.

Spokane Tribal Natural Resources
P.O. Box 480 ● Wellpinit, WA 99040 ● (509) 626 - 4400 ● fax 258 - 9600

May 31, 2017

Pam Druliner, Natural Resource Specialist
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706

RE: Scoping Comments on Draft EA for the Modernization and Overhaul of Grand Coulee Dam's G1 through G18 (sent via: pdruliner@usbr.gov)

Dear Ms. Druliner:

On behalf of the Spokane Tribe's Natural Resources Department ("Department"), thank you for extending the Tribe's deadline to submit comments, and please accept these comments on the Draft Environmental Assessment for the Grand Coulee G1 through G18 Generating Units Modernization and Overhaul ("Draft EA"). Upon review of the Draft EA, the Department was struck by the Bureau of Reclamation's ("BOR") failure to meaningfully consider the comments submitted by the Department in 2016. Instead the of the required hard look BOR is required to perform under the National Environmental Policy Act ("NEPA"), BOR appears to conveniently ignore the larger context in which this project is occurring. The Department's comments are limited to the following two issues, and we incorporate by reference the entirety of the comments submitted by the Department on November 15, 2016.

(1) BOR failed to address the Columbia River System Operations Environmental Impact Statement ("CRSO EIS"). GCEA-STOI1

Within the EA's "Other Related Actions and Activities" section it fails to acknowledge the court ordered EIS for the FCRPS. On May 4, 2016 Judge Simon ordered the agencies responsible for operation of the FCRPS to conduct an EIS, which is currently underway. As an example, the CRSO public notice sent out in September of 2016 stated the following: GCEA-STOI2

> The EIS will evaluate and update the Agencies' approach for long-term system operations and configuration through the analysis of different alternatives to current operations and **maintenance**; including changes to flood risk management, navigation, hydropower, irrigation, fish and

> wildlife conservation, recreation and municipal and industrial water supply.

(Emphasis added). Accordingly, in the Tribe's scoping comments for this EA the Tribe stated the following:

> In November of 2015 the Department submitted comments on the proposed Drum Gate Maintenance Schedule. The Drum Gate Maintenance Structure is part of the overall updating and maintenance projects for Grand Coulee Dam, including this G-1-18 Modernization and Overhaul Project. BOR should consider all of the projects at the same time that will likely be included in this updating and maintenance process to ensure two potential issues are properly addressed. One, BOR should consider these planned projects as a whole to avoid any potential segmentation issues that could arise under NEPA. Two, given the potential scope of this work and other work planned, BOR must ensure that its obligations under 16 U.S.C. Section 839b(h)(11)(A)(i)&(ii) are addressed. These combined projects will modernize Grand Coulee Dam and should include studies and potential modifications and additions that address fish passage and reestablishment measures outlined in the NPCC 2014 Fish and Wildlife Program, and those same reintroduction considerations that will be part of the CRSO EIS process. In short, the Dam should be modernized for a future with anadromous fish occupying the habitats above Grand Coulee Dam.

However, instead of addressing how this significant maintenance proposal fits within the CRSO EIS, the BOR simply ignored this comment and repeatedly states that these comments are outside the scope of this Project or simply this Project will not impact current operations, therefore, it requires no analysis of impacts on fish and wildlife.

First, this runs counter to the scope of the CRSO EIS, which is to include long-term maintenance as noted above. Second, BOR's assumptions ignore Judge Simon's articulation of the need for the agencies that operate the FCRPS to not commit resources that could lead to bureaucratic steam rolling. *See NWF v. NMFS*, 01-00640-SI, March 27, 2017. The Department is very concerned that BOR is pushing through this maintenance project that could last longer than a decade without consideration for how this fits within the CRSO EIS. As clearly stated, this project is not safety related, and the work can be done on an as needed basis as stated in the no action alternative: GCEA-STOI3

> Under the No Action alternative, Reclamation would continue operating the G1 through G18 generating units with no scheduled component modernization and overhaul. The 18 units would continue generating power until a failure occurs, at which time the generating unit would be taken offline and overhaul would be done. Because none of the modernization and overhaul work would be planned under this Alternative, units may be offline for extended periods. Repair costs and

time needed to obtain replacement parts would likely continue to increase based on the aging technology and the scarcity of parts. Age-related wear issues would remain and may become worse over time. Unit components would be modernized and overhauled as failure occurred.

Given that the no-action alternative does not implicate any immediate safety issues with operating Grand Coulee Dam it should be made part of the CRSO EIS to avoid undermining the NEPA process that is underway. This project along with all long-term maintenance proposals for Grand Coulee Dam must be considered in the CRSO EIS, and not separated from it to avoid the bias that will result from the commitment of significant resources prior to the completion of the CRSO EIS.

(2) BOR Failed to Address the Requirements of the Northwest Power Act

The Act requires that BOR "exercise such responsibilities, taking into account at each relevant stage of decision making processes to the fullest extent practicable, the program adopted by the Council under this subsection." 16 U.S.C. Section 839b(h)(11)(A)(ii). Instead of analyzing how this proposal fits within the Council's program BOR simply stated the following: "The Project will not preclude our potential to address obligations under 16 U.S.C. Section 839b(h)(11)(A)(i)&(ii) in the future." The Act requires that BOR address the Program not simply decide the project will not preclude BOR from satisfying its obligations. GCEA-STOI4

Conclusion

Based on the above concerns and those raised in the Tribe's scoping comments, BOR should suspend maintenance projects that are long-term commitments of significant resources until the CRSO EIS is complete. To do otherwise will undermine the agencies' and the region's ability to fully comply with Judge Simon's order that the intractable problems with the FCRPS be given a fresh and comprehensive look through the mandated EIS. If you have any questions, feel free to contact me at (509) 626-4427.

Sincerely,

B.J. Kieffer
Director, Department of Natural Resources
Spokane Tribe of Indians
(509) 626-4427
bjk@SpokaneTribe.com

Cc: Carol Evans, Chairwoman, Spokane Tribe of Indians
Brent Nichols, Fisheries Manager, Spokane Tribe of Indians
Ted Knight, Special Legal Counsel, Spokane Tribe of Indians

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Mailing Address: 600 Capitol Way N, Olympia, WA 98501-1091 • (360) 902-2200 • TDD (360) 902-2207
Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia, WA

May 12, 2017

Submitted via email: pdruliner@usbr.gov

Dear Ms. Druliner,

On behalf of the Washington Department of Fish and Wildlife (WDFW), I am submitting these brief comments on the draft Environmental Assessment (EA) for Grand Coulee G1 through G18 Generating Units Modernization and Overhaul.

The draft EA states that the project will not impact fisheries, water resources/hydrology, or federally protected species under either action alternative. It would be helpful to have more detail on how the project will ensure that there is no impact on water levels (or adaptive management of water levels) in Lake Roosevelt or entrainment of native or non-native fish that live in the reservoir. GCEA-WDFW1

It would also be helpful for the final EA to discuss how the action alternatives may or may not affect the potential to reintroduce anadromous fish above Grand Coulee Dam, an action that is currently being analyzed for feasibility pursuant to the Northwest Power and Conservation Council's Fish and Wildlife program. More specifically, the preferred action should not delay the prospects for installing "fish-friendly" turbines at the dam, and the Bureau of Reclamation should seriously consider, with documentation of that consideration, the opportunity this project presents to install "fish-friendly" turbines. It would seem to make sense from a budget and general efficiency perspective to replace or refurbish the Francis turbines while the generating units are disassembled, but that is not currently part of any action alternative presented in the draft EA. GCEA-WDFW2 GCEA-WDFW3

Please explain the rationale for choosing not to replace or refurbish the turbines while the units are disassembled. If, as we suspect, replacement or refurbishment as part of the preferred action makes sense, we strongly urge you to ensure that the new or refurbished turbines are fish-friendly. As has recently been demonstrated at Grant County Public Utility District's Wanapum Dam, fish-friendly turbines can also allow for significant increases in energy production, so they would likely be a worthy investment even under a scenario where anadromous fish reintroduction above Grand Coulee proves infeasible. GCEA-WDFW4 GCEA-WDFW5

In addition, please address whether the action alternatives may affect potential upstream or downstream collection sites or technologies for adult or juvenile anadromous fish. We urge you to GCEA-WDFW6

choose a preferred action that does not limit potential upstream or downstream passage technologies or potential locations for those technologies. GCEA-WDFW7

Thank you for your consideration of these comments, and please contact me at michael.garrity@dfw.wa.gov or 360-810-0877 if you have questions.

Sincerely,

Michael D. Garrity
Columbia Basin Mitigation Manager/Water Policy Lead

Superintendent: Paul Turner
Business Manager: ESD 171

Board Members:
Joette Barry, George LaPlace,
Carla Marconi, Kenneth Stanger,
Rich Black

Grand Coulee Dam School District

110 Stevens Avenue
Coulee Dam WA 99116
(509) 633-2143 Fax (509) 633-2530
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May 12, 2017

Pam Druliner
Natural Resource Specialist
Bureau of Reclamation
1150 North Curtis Road, Suite 100
Boise, Idaho 83706-1234
(208) 378-6214
pdruliner@usbr.gov

Ms. Druliner,

On April 14, 2017, Bureau of Reclamation ("Bureau") sought public comments on its Grand Coulee G1 through G18 Generating Units Modernization and Overhaul Draft Environmental Assessment ("Draft EA"). *See* Bureau, Draft Environmental Assessment, Grand Coulee G1 through G18 Generating Units Modernization and Overhaul Draft EA (April 2017). Accordingly, the Grand Coulee Dam School District ("District") offers the following comments.

The District certainly supports the Bureau's continued modernization and investment efforts here. GCEA-GCDSD1
However, the Bureau needs to assist the District by ensuring funds for the additional students enrolled within the District throughout the life of this project. This financial impact is expected to continue to occur GCEA-GCDSD2
over the 12 year life of this proposed modernization project, *see id.* § 2.3 (preferred alternative). Ensuring funds for these additional students throughout the life of this project is essential because the District is already faced with financial constraints that are a result of cumulative Bureau projects that began in 2010 with the Third Powerplant Overhaul (2010), the John W. Keys III Pump-Generating Plant Modernization Project (2012), and the New Fire Station (2015). *See id.* § 1.7 (recognizing cumulative impacts from related projects). These cumulative impacts have and will continue to result in an undeniable increase in student enrollment within the District leaving it financially burdened and unable to provide high quality educational opportunities the District's students need to ensure their future success.

An additional important aspect of this issue here too is that 60% of the District's student body is GCEA-GCDSD3
comprised of Native American tribal members most from the Confederated Tribes of the Colville Indian Reservation and neighboring Indian tribes to whom the Bureau owes a trust responsibility. This recognized trust responsibility requires the Bureau to "take all actions reasonably necessary" to protect these interests, *see id.* § 1.6.5 (recognizing same), which the Colville Tribes have also historically advocated for. *See* Agreement with the Columbia and Colville, July 7, 1883, 23 stat., 79. Vol. 1, p. 224 (noting request for school). This necessarily includes supporting the "national goal of the United States" to provide "the quantity and quality of educational services and opportunities [that] permit Indian children to compete and excel in the life areas of their choice, and achieve a measure of self-determination essential to their social and economic well-being," 25 U.S.C. § 450(a)(c) (Declaration of national goal). Leaving the District underfunded impedes this goal.

Regarding impacts on the District, it is clear the Bureau still does not understand the complexity and unique situation here or it simply chooses to unacceptably ignore it. Assuming the former, in four separate letters, the District attempted to provide the Bureau with this understanding without avail. *See* Letter from Dennis L. Carlson, Ed.D to Karl Wirkus, Regional Director U.S. Bureau of Reclamation (July

20, 2011); Letter from Dennis L. Carlson, Ed.D to Karl Wirkus, Regional Director U.S. Bureau of Reclamation (Oct. 31, 2011); Letter from Dennis L. Carlson, Ed.D to Keith McGowan, Environmental Protection Specialist, Bureau of Reclamation, Columbia Cascades Area Office (Jan. 24, 2012) (providing a detailed background and discussion of cumulative effects) ("Jan. 24, 2102 Letter"); Letter from Dennis L. Carlson, Ed.D to Jim Taylor, Bureau of Reclamation (Feb. 6, 2012) (same) ("Feb. 6, 2012 Letter"), attached here. The most salient and relevant points from those letters follow.

First, it is beyond dispute that but for the existence of the Grand Coulee Dam, there is very little reason for any of the local communities to exist in the area. *See* Feb. 6, 2012 Letter (citation omitted); Jan. 24, 2012 Letter (same). Second, the District serves students from areas affected by Bureau projects such as this one. Specifically, Lincoln, Ferry, Okanogan, Grant and Douglas counties along with students from the Nespelem and Keller Elementary School Districts both of which are within the Colville Indian Reservation boundaries. *Id.* Third and most important here, the District has historically faced and continues to face severe funding limitations. There are currently three basic funding sources: state, federal, and local. *Id.* Notwithstanding state education funds that the District receives, to cover remaining basic operational expenses the District must obtain $5,300 per student per school year from local and federal sources. *Id.* (providing detailed explanation). Typically, local funds are generated through a voter approved property tax levy, sales of school meals, and donations. *Id.* However, because of the large amounts of federally owned lands here, the District cannot rely on funding from property taxes. *Id.* Accordingly, the District must rely on federal funding sources and contrary to a prior Bureau position, the District receives no Impact Aid funding, *see* 20 U.S.C. ch. 70, for students connected to the federally owned Grand Coulee Dam project due to the federal government's ownership of the lands associated with the project prior to the effective date of the Impact Aid legislation, *see* Feb. 6, 2012 Letter (stating same). GCEA-GCDSD4

In light of these three basic points, since Bureau's modernization projects began in 2010 District student enrollment has increased steadily by 53 students in 2016-17. This has resulted in a budgetary shortfall of approximately $53,000 in 2016-17 alone. This does not reflect additional amounts needed for special education programs as well as increased staffing needs and expenses. It also does not account for the reduction of services to the currently enrolled students. Regarding the Draft EA's proposed modernization project here, additional student enrollment is unquestionably expected through the life of these projects and thus far the Bureau has failed to consider this growing issue. Moreover, the Bureau has not offered or sought any solution or alternative otherwise to the detriment of the local community, members of the Colville Indian Tribe and neighboring Indian tribes, and the current and prospective students whose education is at stake here. GCEA-GCDSD5

The District urges the Bureau to consider these real impacts and work with it in a meaningful manner to find and offer a solution. It is essential that the Bureau support the District here. Please feel free to contact me if you need any additional information in relation to this communication.

Sincerely,

Paul Turner
Superintendent

Druliner, Pam <pdruliner@usbr.gov>

generators

2 messages

[redacted] Sat, Apr 15, 2017 at 11:47 AM
To: pdruliner@usbr.gov

GCEA-PC1

Pam
I prefer the Bureau's recommendation of two per year.

good luck sorting through all of this!!

[redacted]

Druliner, Pam <pdruliner@usbr.gov> Mon, Apr 17, 2017 at 10:04 AM
To: [redacted]

Thanks for your comment [redacted] Have a good day!

Pam
[Quoted text hidden]
—

Pam Druliner
Natural Resource Specialist
Bureau of Reclamation, Pacific Northwest Region
1150 N. Curtis Road, Boise 83706

pdruliner@usbr.gov
208-378-6214

Public Scoping Comments Received on the Draft EA. Reclamation's Responses, and Actions Taken in the Final EA

Public Comment	Reclamation Response	Final EA Action
GCEA-STOI1, BOR failed to address the Columbia River System Operations Environmental Impact Statement ("CRSO EIS"). Within the EA's "Other Related Actions and Activities" section it fails to acknowledge the court ordered EIS for the FCRPS.	Thank you for your comment. We do not consider the G1-G18 Modernization and Overhaul Project (Project) and the CRSO EIS to be connected actions because they have independent utility and because neither automatically triggers the other: each can proceed independent of the other, they are not interdependent parts of a larger action, and they do not depend on any larger action for their justification. See 40 C.F.R. § 1508.25(a)(1)(i)-(iii).	Reclamation edited the final EA to include reference to the CRSO EIS and drum gate overhaul (Section 1.10).
GCEA-STOI2, On May 4, 2016 Judge Simon ordered the agencies responsible for operation of the FCRPS to conduct an EIS, which is currently underway. As an example, the CRSO public notice sent out in September of 2016 stated the following: The EIS will evaluate and update the Agencies' approach for long-term system operations and configuration through the analysis of different alternatives to current operations and maintenance; including changes to flood risk management, navigation, hydropower, irrigation, fish and wildlife conservation, recreation and municipal and industrial water supply. (Emphasis added). Accordingly, in the Tribe's scoping comments for this EA the Tribe stated the following: "In November of 2015 the Department submitted comments on the proposed Drum Gate Overhaul Schedule. The Drum Gate Maintenance Structure is part of the overall updating and maintenance projects for Grand Coulee Dam, including this G-1-18 Modernization and Overhaul Project. BOR should consider all of the projects at the same time that will likely be included in this updating and maintenance process to ensure two potential issues are properly addressed. One, BOR should consider these planned projects as a whole to avoid any potential segmentation issues that could arise under NEPA. Two, given the potential scope of this work and other work planned, BOR must ensure that its obligations under 16 U.S.C. Section 839b(h)(11)(A)(i)&(ii) are addressed. These combined projects will modernize Grand Coulee Dam and should include studies and potential modifications and additions that address fish passage and reestablishment measures outlined in the NPCC 2014 Fish and Wildlife Program, and those same reintroduction considerations that will be part of the CRSO EIS process. In short, the Dam should be modernized for a future with anadromous fish	Thank you for your comment. Reclamation determined this Project was not routine or long-term maintenance, and therefore required independent NEPA analysis. We have a routine maintenance schedule for each powerhouse and dam and those activities are coordinated throughout the year at the facility. Operations for routine maintenance planning will be part of the CRSO EIS – but site specific modernization or overhaul, as exemplified by this Project that is not routine will have site-specific NEPA as required. Likewise, Reclamation anticipates needing to conduct drum gate overhaul at Grand Coulee in the near future, depending on results of safety studies. This overhaul work differs from the routine, opportunistic drum gate overhaul that occurs during years with adequately low drawdowns. It also is independent of the CRSO EIS and the G1-G18 Modernization and Overhaul. The Grand Coulee Dam drum gates are original to the construction of the dam and are nearly 80 years old. The effort required to overhaul these structures is not considered in our routine maintenance schedule based upon duration, implementation schedule, complexity, and the planning horizon of the NEPA documents. Reclamation does not consider drum gate overhaul as a connected action to either the Project or the CRSO EIS because each can proceed independently, are not interdependent parts of a larger action, and they do not depend on any larger action for their justification. See 40 C.F.R. § 1508.25(a)(1)(i)-(iii). The G1-G18 Project and, if Reclamation undertakes planning for drum gate overhaul, will be included in the CRSO EIS as other activities, past, present, or foreseeable actions, for cumulative effects. Because the G1-G18 Project is not impacting dam and reservoir	No Change

Public Comment	Reclamation Response	Final EA Action
occupying the habitats above Grand Coulee Dam. However, instead of addressing how this significant maintenance proposal fits within the CRSO EIS, the BOR simply ignored this comment and repeatedly states that these comments are outside the scope of this Project or simply this Project will not impact current operations, therefore, it requires no analysis of impacts on fish and wildlife. First, this runs counter to the scope of the CRSO EIS, which is to include long-term maintenance as noted above."	operations and thereby not impacting hydrology, fisheries or water quality it will not have a cumulative impact to those resources. Any potential impacts to operations from the drum gate overhaul project are too uncertain for analysis at this point. In terms of fish passage or reintroduction, Reclamation remains committed to working with our partners. When the Grand Coulee and Chief Joseph Dams were constructed on the Columbia River, they did not provide for fish passage. Anadromous runs into the Columbia River Basin above Grand Coulee Dam were blocked. In recent years there has been increasing interest in the Region in the general concept of reintroduction of anadromous fish into these blocked areas (Reintroduction). It has been introduced through the Columbia River Treaty process as well as through the Northwest Power and Conservation Council's (NPCC) Fish and Wildlife Program. Reintroduction is a complex, large-scale, international concept and cannot be considered, evaluated, or implemented by any single entity or agency. A coordinated approach among water users, tribes, states, multiple federal agencies, and numerous Canadian entities and First Nations would be necessary. The decision to reintroduce fish in the United States above Grand Coulee and Chief Joseph Dams also requires more information than is currently available. The Northwest Power and Conservation Council (NWPCC), Bonneville Power Administration and Reclamation are working to fill this gap by funding the Spokane Tribe of Indians to complete an initial habitat assessment under NWPCC's Fish and Wildlife plan. The Project will not impede or conflict with any future reintroduction studies or plans. The proposed action focuses on modernizing and overhauling the electrical components of the generating units, penstocks, and external and internal cranes. The configuration and structure of the dam itself is not involved.	

Public Comment	Reclamation Response	Final EA Action
GCEA-STOI3, Second, BOR's assumptions ignore Judge Simon's articulation of the need for the agencies that operate the FCRPS to not commit resources that could lead to bureaucratic steam rolling. See NWF v. NMFS, 01-00640-SI, March 27, 2017. The Department is very concerned that BOR is pushing through this maintenance project that could last longer than a decade without consideration for how this fits within the CRSO EIS.	Thank you for your comment. In the April 3, 2017 amended order issued in National Wildlife Federation v. National Marine Fisheries Service, No. 01-00640-SI (D. Or.), the court considered whether to enjoin large capital expenditures at the four Lower Snake River Dams; the order did not mention Grand Coulee Dam. While the court concluded that such capital expenditures at the four Lower Snake River Dams could "creat[e] a significant risk of bias in the NEPA process," Id. at 31; the court's order did not enjoin any pending or presently planned expenditures at Grand Coulee. With respect to this Project, Reclamation does not believe it would preclude a look at reasonable alternatives in the CRSO EIS. As explained above, the G1-G18 Project focuses on modernizing and overhauling the electrical components of the generating units, penstocks, and external and internal cranes. The configuration and structure of the dam itself is not involved.	
GCEA-STOI4, BOR Failed to Address the Requirements of the Northwest Power Act. The Act requires that BOR "exercise such responsibilities, taking into account at each relevant stage of decision making processes to the fullest extent practicable, the program adopted by the Council under this subsection." 16 U.S.C. Section 839b(h)(11)(A)(ii). Instead of analyzing how this proposal fits within the Council's program BOR simply stated the following: "The Project will not preclude our potential to address obligations under 16 U.S.C. Section 839b(h)(11)(A)(i)&(ii) in the future." The Act requires that BOR address the Program not simply decide the project will not preclude BOR from satisfying its obligations.	Thank you for your comment. The "program" referenced is the Pacific Northwest Power and Conservation Council's fish and wildlife program promulgated pursuant to 16 U.S.C. § 839b(h)(5) – (9). The "responsibilities" referred to are Reclamation's obligations, among others, to operate and maintain Grand Coulee Dam. In other words, the statutory term cited in the comment requires Reclamation in its operation and maintenance of Grand Coulee dam to take into account the Council's fish and wildlife program to the fullest extent practicable at each relevant stage of the decision-making process. It does not, as the comment claims, require Reclamation to analyse how the generator modernization Project fits within the Council's fish and wildlife program. Reclamation has satisfied its obligation to take into account the Council's program here. As explained above in response to comment number 2, Reclamation has carefully considered how this Project relates to the relevant Council program efforts to evaluate habitat above Chief Joseph and Grand Coulee Dams early in Reclamation's decision-making process for the G1-G18 Project.	No Change

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Comment GCEA-WDFW1. It would be helpful to have more detail on how the project will ensure that there is no impact on water levels (or adaptive management of water levels) in Lake Roosevelt or entrainment of native or non-native fish that live in the reservoir.	Thank you for your comment. The G1-G18 Modernization Project is not proposing changes to the operation of Grand Coulee Dam or reservoir. Therefore, we will not have an impact on resident fish populations in the reservoir or downstream due to the modernization work. In this EA, we focus our analysis on resources the Project may affect and have determined it would not impact hydrology, water quality, or fisheries.	Text added to Section 3.1.1.2
Comment GCEA-WDFW2. It would also be helpful for the final EA to discuss how the action alternatives may or may not affect the potential to reintroduce anadromous fish above Grand Coulee Dam…	Thank you for your comment. In terms of fish passage or reintroduction, Reclamation remains committed to working with our partners. When the Grand Coulee and Chief Joseph dams were constructed on the Columbia River, they did not provide for fish passage. Anadromous runs into the Columbia River Basin above Grand Coulee Dam were blocked. In recent years there has been increasing interest in the region in the general concept of reintroduction of anadromous fish into these blocked areas (Reintroduction). It has been introduced through the Columbia River Treaty process as well as through the Northwest Power and Conservation Council's (NPCC) Fish and Wildlife Program. Reintroduction is a complex, large-scale, international concept and cannot be considered, evaluated, or implemented by any single entity or agency. A coordinated approach among water users, tribes, states, multiple federal agencies, and numerous Canadian entities and First Nations would be necessary. The Project will not impede or conflict with any future reintroduction studies or plans. The proposed action focuses on modernizing and overhauling the electrical components of the generating units, penstocks, and external and internal cranes. The configuration and structure of the dam itself is not involved.	Text added to Section 3.1.1.3

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Comment GCEA-WDFW3. The preferred action should not delay the prospects for installing "fish-friendly" turbines at the dam, and the Bureau of Reclamation should seriously consider, with documentation of that consideration, the opportunity this project presents to install "fish-friendly" turbines.	Thank you for your comment. The removal or replacement of the turbines is outside of the scope of this Project. The modernization efforts being performed do not require a full disassembly of the units, therefore we are not considering replacing the turbines. This project is addressing electrical components of the generators, the service cranes, and the penstocks. In terms of engineering, Frances turbines are not considered fish-friendly, nor can they be modified or updated to be fish friendly. Due to head, pressures and the efficiency requirements for Francis turbines, it is not mechanically or technologically feasible to engineer a fish-friendly Francis turbine. Lower head units that would have a Kaplan (max head of 220 feet for a max output of 100 megawatts (MW)) or propeller type (max head of 120 feet maximum output possible design of approximately 20 MW) can be designed to be fish friendly. However, Grand Coulee has a maximum head of 340 feet. In order for Grand Coulee to add a fish friendly runner, Reclamation would need to reduce the head of the dam (from 340 to 220 feet or less) which in turn would greatly reduce the power generation. Changing the height of the dam to replace the Francis turbines with Kaplans is economically and technologically unfeasible at this time.	Text added to Section 3.1.1.3
Comment GCEA-WDFW4. Please explain the rationale for choosing not to replace or refurbish the turbines while the units are disassembled.	Thank you for your comment. The turbines for units G1-18 are newer turbines that were replaced by Reclamation in the 1990's. The modernization efforts being performed do not require a full disassembly of the units. As such, replacing the turbines was not identified as a need at this time. See our response to comment 3.	No Change
Comment GCEA-WDFW5. As has recently been demonstrated at Grant County Public Utility District's Wanapum Dam, fish-friendly turbines can also allow for significant increases in energy production, so they would likely be a worthy investment even under a scenario where anadromous fish reintroduction above Grand Coulee proves infeasible.	Thank you for your comment. Please see our previous responses to comments 3 and 4 regarding the turbines at Grand Coulee.	Text added to Section 3.1.1.3

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Comment GCEA-WDFW6. Please address whether the action alternatives may affect potential upstream or downstream collection sites or technologies for adult or juvenile anadromous fish.	Thank you for your comment. The project is not proposing changes to the operation of Grand Coulee. River conditions at potential upstream or downstream collection sites would not be impacted because we are not altering current hydrology or water quality due to this Project. Subsequently, there would be no change at these sites based upon implementation of the Project. Similarly, technologies appropriate for current conditions would be applicable to conditions following project implementation and would not be affected by the Project.	Text added to Section 3.1.1.3
Comment GCEA-WDFW7. We urge you to choose a preferred action that does not limit potential upstream or downstream passage technologies or potential locations for those technologies.	Thank you for your comment. None of the alternatives analyzed would limit potential upstream or downstream passage technologies or potential locations for those technologies.	No Change
Comment GCEA-GCDSD1. The District certainly supports the Bureau's continued modernization and investment efforts here.	Thank you for your comment.	No Change

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Comment GCEA-GCDSD2. However, the Bureau needs to assist the District by ensuring funds for the additional students enrolled within the District throughout the life of this project. This financial impact is expected to continue to occur over the 12 year life of this proposed modernization project, see id. § 2.3 (preferred alternative).	Thank you for your comment. Reclamation has no authority to provide funding assistance to the School District for the costs attributable to additional students. Reclamation does not expect the contractor workforce to relocate permanently to the communities surrounding Grand Coulee during their specific work assignments. This assumption is based on our understanding that construction workers typically move from job site to job site for the duration of their work. They use temporary accommodations such as motels/hotel, RV parks and campgrounds during the week, and return to their families when they are off work. Based on information in the John W. Keys III Pump-Generating Plant Modernization Project Final Environmental Assessment (Reclamation 2012), it is possible that some of the contractor workforce may temporarily relocate to the area and thus enroll their school-age children in the local schools. For the proposed project, Reclamation assumed half of the workers not already living in the local area would relocate there temporarily and enroll one child in the school district, resulting in an increased enrollment of 40 and 50 students. This estimate is considered very high because it accounted for all the contract workforce being present at the same time. In reality, 10 different contracts will take place over the Project duration, and they will be spaced out according to what components being worked on at that time. The quantity of work occurring at one time is limited by space within the powerhouses for equipment, material, and laydown. Based on 2014-2015 GCDSD funding revenues and enrollment data, the increase in student population would result in a reduction in the average funding level per student of between 5.2 and 6.4 percent until additional funding sources respond (OSPI 2017b). In Washington, most of the large school entitlement programs (basic education, special education, learning assistance, and bilingual education) are tied to student enrollment and fluctuate as enrollment changes throughout the school year. Thus, while the reduction in funding has implications for the GCDSD's short- and long-range planning and budgeting, the majority of the funding lag is expected to have a duration of less than one academic year. After that time, state and federal funding levels would increase in response to the added student	We have revised Sections 3.8.1.2, 3.8.3.4, and 3.8.4 in the Final EA to provide an estimate of the additional students that may be temporarily enrolled as a result of the modernization work at Grand Coulee.

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	population (federal funding accounted for 23 percent of the District's revenues in 2014-2015). The increase in student population could also increase the student-to-instructional-staff ratio depending on the grade distribution of the additional students. There is no existing legal authority for Reclamation to provide funding assistance to the School District. As you may recall from our May 30, 2014 letter to The Honorable Linda Evans Parlette: "Section 6 of the Coulee Dam Community Act of 1957 authorized the Secretary of the Interior to transfer ownership of "the school buildings and grounds, athletic fields, tennis courts, and other properties currently used for educational purposes to the appropriate school district." In the legislative history for that Act, Senate Report No. 267 on S. 1574 states that a purpose of the Act was to provide for "transfer of municipal facilities and limited financial assistance to the town of Coulee Dam and to Grand Coulee." The report subsequently indicates that the Act provides "assurances that costs of this character will terminate," and that, "After the specific and limited allowances provided in S. 1574, the Government will be relieved of any further financial responsibility to these two communities." Because financial assistance was provided as required by the Act and the school property transferred out of federal ownership in 1959, there is no current authority for the Department to provide the District with any further financial assistance. Since the letter was written Reclamation's authorities have not changed.	

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Comment GCEA-GCDSD3. An additional important aspect of this issue here too is that 60% of the District's student body is comprised of Native American tribal members most from the Confederated Tribes of the Colville Indian Reservation and neighbouring Indian tribes to whom the Bureau owes a trust responsibility. This recognized trust responsibility requires the Bureau to "take all actions reasonably necessary" to protect these interests, see id. § 1.6.5 (recognizing same), which the Colville Tribes have also historically advocated for. See Agreement with the Columbia and Colville, July 7, 1883, 23 stat., 79. Vol. 1, p. 224 (noting request for school). This necessarily includes supporting the "national goal of the United States" to provide "the quantity and quality of educational services and opportunities [that] permit Indian children to compete and excel in the life areas of their choice and achieve a measure of self-determination essential to their social and economic well-being," 25 U.S.C. § 450(a)(c) (Declaration of national goal). Leaving the District underfunded impedes this goal.	Thank you for your comment. Reclamation recognizes the important role the School District plays in educating tribal youth and we appreciate your commitment and excellence. We are not authorized, however, to provide funding for the School District, regardless of enrolment statistics.	No Change
Comment GCEA-GCDSD4. However, because of the large amounts of federally owned lands here, the District cannot rely on funding from property taxes. Id. Accordingly, the District must rely on federal funding sources and contrary to a prior Bureau position, the District receives no Impact Aid funding, see 20 U.S.C. ch. 70, for students connected to the federally owned Grand Coulee Dam project due to the federal government's ownership of the lands associated with the project prior to the effective date of the Impact Aid legislation, see Feb. 6, 2012 Letter (stating same).	Thank you for your comment. The Department of Education administers the Impact Aid program and as such it is outside of Reclamation's authority. Information about the Impact Aid program may be obtained from the Office of Elementary and Secondary Education. Reclamation is not in a position to change the dates associated with the Impact Aid legislation.	No Change
Comment GCEA-GCDSD5. Regarding the Draft EA's proposed modernization project here, additional student enrolment is unquestionably expected through the life of these projects and thus far the Bureau has failed to consider this growing issue.	Thank you for your comment. Please see response to GCEA-GCDSD2.	Text Added to Sections 3.8.1.2, 3.8.3.4, and 3.8.4
Comment GCEA-PC1. I prefer the Bureau's recommendation of two per year.	Thank you for your comment.	No Change