FACT SHEET

The United States Environmental Protection Agency (EPA) proposes to issue National Pollutant Discharge Elimination System (NPDES) Permits to discharge pollutants pursuant to the provisions of the Clean Water Act, 33 USC §1251 et seq to:

Facility	Permit Number
Ice Harbor Lock and Dam, U.S. Army Corps of Engineers	WA0026816
Lower Monumental Lock and Dam, U.S. Army Corps of Engineers	WA0026808
Little Goose Lock and Dam, U.S. Army Corps of Engineers	WA0026786
Lower Granite Lock and Dam, U.S. Army Corps of Engineers	WA0026794

Public Comment Start Date: March 18, 2020
Public Comment Expiration Date: May 4, 2020

Technical Contact: Jenny Wu
Email: Wu.Jennifer@epa.gov
Phone: (206) 553-6328
1-800-424-4372 ext 6328 (within Alaska, Idaho, Oregon and Washington)

The EPA Proposes to Issue NPDES Permits

The EPA proposes to issue NPDES permits for the facilities referenced above. The draft permits place conditions on the discharge of pollutants from the hydroelectric generating facilities to waters of the United States (U.S.). In order to ensure the protection of water quality and human health, these permits place limits on the types and amounts of pollutants that can be discharged from the facilities.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions for the facilities
- maps and descriptions of the discharge locations
- technical material supporting the conditions in the permits

State Certification

The EPA requested final 401 certification from the Washington Department of Ecology (Ecology) on March 18, 2020.

Public Comment

Persons wishing to comment on, or request a Public Hearing for, the draft permits for these facilities may do so in writing by the expiration date of the Public Comment period. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to the EPA as described in the Public Comments Section of the attached Public Notice. Comments must include the commenter's name, address, telephone number, permit name, and permit number. Comments must include a concise statement of the basis and any relevant facts the commenter believes the EPA should consider in making its decision regarding the conditions and limitations in the final permit.

After the comment period closes, and all comments have been considered, the EPA will review and address all submitted comments. EPA's Director for the Water Division will then make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permits will become final, and the permits will become effective upon issuance. If substantive comments are received, the EPA will address the comments and issue the permit. The permit will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

Documents are Available for Review

The draft NPDES permits, fact sheet, and related documents can be reviewed or obtained by visiting or contacting the EPA Region 10 Operations Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the address below. The draft permits, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at: 'http://EPA.gov/r10earth/waterpermits.htm'

US EPA Region 10
Suite 155
1200 Sixth Avenue, (MS: 19-C04)
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372, ext 0523 (within Alaska, Idaho, Oregon and Washington)

The draft permits and fact sheet also are available at the following location:

U.S. Environmental Protection Agency Region 10
Washington Operations Office
300 Desmond Dr. SE
Suite 102
Lacey, WA 98503

The draft permits, fact sheet, and other information also can be found by visiting the Region 10 website at: https://www.epa.gov/npdes-permits/proposed-discharge-permits-federal-hydroelectric-projects-lower-snake-river. For technical questions regarding the permits or fact sheet, contact Jenny Wu at the phone number or email listed above. Services can be made available to persons with disabilities by contacting Audrey Washington at (206) 553-0523.

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ACRONYMS

AML	Average Monthly limit
APA	Administrative Procedures Act
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BE	Biological Evaluation
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
BPJ	Best Professional Judgment
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CWA	Clean Water Act
DF	Dilution Factor
DMR	Discharge Monitoring Report
EAL	Environmentally Acceptable Lubricant
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ELG	Effluent Limitation Guidelines
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
GPD	Gallons per Day
GPM	Gallons per Minute
ICIS	Integrated Compliance Information System
LTA	Long Term Average
MDL	Maximum Daily Limit or Method Detection Limit
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
ML	Minimum Level
NEPA	National Environmental Policy Act
NOAA-NMFS	National Oceanic and Atmospheric Administration- National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance (of a treatment facility)
QAP	Quality Assurance Plan
QA/QC	Quality Assurance/Quality Control
TAS	Treatment in a Manner Similar to a State (EPA-Tribal Government Process)
TBEL	Technology-Based Effluent Limitation
TMDL	Total Maximum Daily Load
TSD	EPA Technical Support Document for Water Quality-based Toxics Control
TSS	Total Suspended Solids
US	United States
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WLA	Wasteload Allocation
WQBEL	Water Quality-Based Effluent Limitation
WQS	Water Quality Standards

DEFINITIONS

7Q10 flow (seven-day, ten-year low flow) means the lowest seven-day consecutive mean daily stream flow with a recurrence interval of ten years.

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative [40 CFR 122.2].

Average monthly limits means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. It may also be referred to as the "monthly average limits"[40 CFR 122.2].

Best Available Technology Economically Achievable (BAT) means the technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT effluent limitations guidelines (ELGs), in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT) means the technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

CAS registration number means the number assigned by the Chemical Abstract Service (CAS) to uniquely identify a chemical.

CFR means the Code of Federal Regulations, which is the official annual compilation of all regulations and rules promulgated during the previous year by the agencies of the United States government, combined with all the previously issued regulations and rules of those agencies that are still in effect.

Composite sample means a flow-proportioned mixture of not less than four discrete representative samples collected at the same discharge point within the same 24 hours.

Conventional pollutant means biological oxygen demand (BOD), total suspended solids (TSS), bacteria, oil and grease, and pH as defined in 40 CFR 401.16.

Continuous Discharge means a discharge which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities [40 CFR 122.2].

CWA means the Clean Water Act in the United States Code (USC) (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97-117, 33 USC 1251 et seq. [40 CFR 122.2].

Daily discharge means the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limits expressed as mass "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day [40 CFR 122.2].

The Director means the Regional Administrator of the EPA Region 10, or the Director of the EPA Region 10 Water Division, the Washington Department of Ecology, or an authorized representative thereof.

Discharge when used without qualification means the "discharge of a pollutant."

Discharge Monitoring Report (DMR) means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees [40 CFR 122.2].

Discharge of a pollutant means any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any “indirect discharger” [40 CFR 122.2].

Draft permit means a document prepared under 40 CFR 124.6 indicating the Director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a “permit” [40 CFR 122.2].

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of “pollutants” which are “discharged” from “point sources” into “waters of the United States,” the waters of the “contiguous zone,” or the ocean [40 CFR 122.2].

Effluent limitations guidelines (ELG) means a regulation published by the Administrator under section 304(b) of CWA to adopt or revise “effluent limitations' [40 CFR 122.2].

Environmentally Acceptable Lubricant means lubricants that are “biodegradable” and “minimally-toxic” and are “not bioaccumulative” as defined in this permit. For purposes of the permit, products meeting this permit’s definitions of being an “Environmentally Acceptable Lubricant” include those labeled by the following labeling programs: Blue Angel, European Ecolabel, Nordic Swan, the Swedish Standards SS 155434 and 155470, and EPA’s Design for the Environment (DfE)

Facility means any NPDES point source or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

Grab sample means a single water sample or measurement of water quality taken at a specific time.

Hazardous Material means a material or combination of materials which may present a substantial present or potential hazard to human health, the public health, or the environment. It is also defined at 40 CFR 122.2 to mean any substance designated in 40 CFR 116, pursuant to Section 311 of the CWA.

Indian Country as indicated by 18 USC §1151 means: (a) All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) All dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and, (c) All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

Indian Tribe means any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation [40 CFR 122.2].

Influent means the water from upstream that enters the facility.

Maximum means the highest measured discharge or pollutant in a waste stream during the time period of interest.

Maximum Daily Discharge limitation means the highest allowable “daily discharge” [40 CFR 122.2].

Monthly Average Limit means the average of “daily discharges” over a monitoring month, calculated as the sum of all “daily discharges” measured during a monitoring month divided by the number of “daily discharges” measured during that month [40 CFR 122.2].

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA [40 CFR 122.2].

Nonconventional Pollutants means all pollutants that are not included in the list of conventional or toxic pollutants in 40 CFR 401. This includes pollutants such as chlorine, ammonia, COD, nitrogen, and phosphorous.

Notice of Intent (NOI) means a request, or application, to be authorized to discharge under a general NPDES permit.

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials [except those regulated under the Atomic Energy Act of 1954, as amended (42 USC 2011 et seq.)], heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water [40 CFR 122.2].

Services means the United States Fish and Wildlife Service and/or the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA Fisheries or NMFS)

Technology-based effluent limitation (TBEL) means treatment requirements under Section 301(b) of the Clean Water Act that represent the minimum level of control that must be imposed in a permit issued under section 402 of the Clean Water Act. EPA is required to promulgate technology-based limitations and standards that reflect pollutant reductions that can be achieved by categories, or subcategories of industrial point sources using specific technologies that EPA identifies as meeting the statutorily prescribed level of control under the authority of CWA sections 301, 304, 306, 307, 308, 402, and 501 [33 USC § 1311, 1314,1316,1318,1342, and 1361].

Total Maximum Daily Load (TMDL) means the sum of the individual wasteload allocations (WLAs) for point sources, load allocations (LAs) for non-point sources, and natural background when allocating pollutant loading to a particular waterbody. The TMDL establishes loads at levels that meet applicable water quality standards.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [40 CFR 122.41(n)].

Waters of the United States or waters of the U.S. means:
(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(b) All interstate waters, including interstate “wetlands;”
(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;
(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
(3) Which are used or could be used for industrial purposes by industries in interstate commerce;
(d) All impoundments of waters otherwise defined as waters of the United States under this definition;
(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
(f) The territorial sea; and
(g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition [40 CFR 122.2].

I. Background Information

A. General Information

This fact sheet provides information on the draft National Pollutant Discharge Elimination System (NPDES) permits for four hydroelectric projects: Ice Harbor Lock and Dam, Lower Monumental Lock and Dam, Little Goose Lock and Dam, and Lower Granite Lock and Dam. The EPA is including these facilities in one fact sheet because they have similar operations and discharges, and have outfalls into the same waterbody, the Lower Snake River. In addition, all of these hydroelectric projects are operated by the U.S. Army Corps of Engineers (USACE). Figure 1 includes a map of hydroelectric generating facilities on the Columbia River and Lower Snake River. The four permits in this Fact Sheet on the Lower Snake River are the four easternmost dams marked in green in Figure 1.

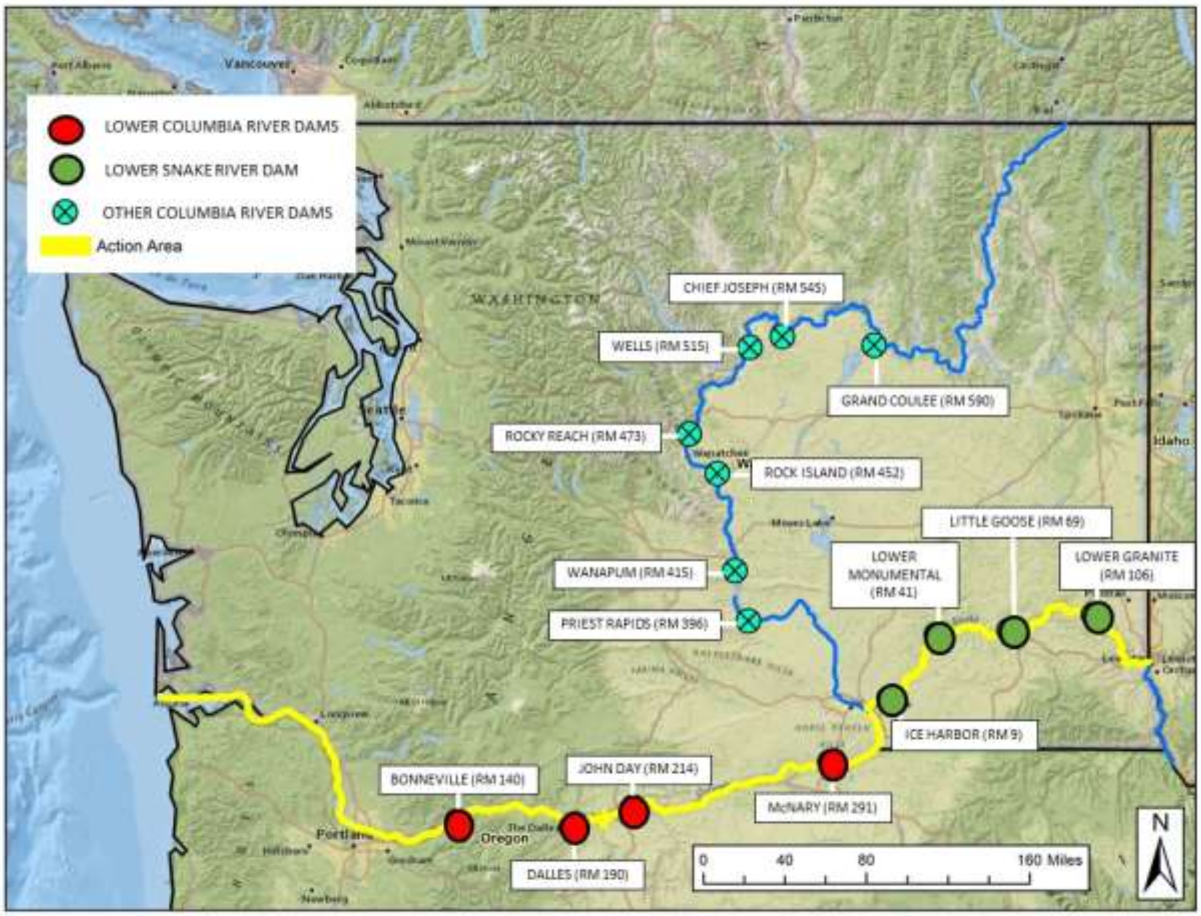

Figure 1. Hydroelectric Generating Facilities on the Columbia River and Lower Snake River

Table 1. General Facility Information for Ice Harbor Lock and Dam

NPDES Permit #:	WA0026816
Applicant:	Ice Harbor Lock and Dam, USACE
Type of Ownership	Federal
Physical Address:	2763 Monument Drive Burbank, Washington 99323
Mailing Address:	2763 Monument Drive Burbank, Washington 99323
Facility Contact:	Steven Heninger Environmental Compliance Coordinator (509) 543-3204
Facility Location:	Latitude: 46° 15’ 3” N Longitude: 118° 53’ 5” W
Receiving Water	Snake River, Washington
Facility Outfalls	001 Latitude: 46° 15’ 3” N Longitude: 118° 53’ 5” W 002 Latitude: 46° 15’ 1” N Longitude: 118° 53’ 0.2” W 003 Latitude: 46° 15’ 2” N Longitude: 118° 52’ 49” W 004 Latitude: 46° 14’ 50” N Longitude: 118° 52’ 51” W 005 Latitude: 46° 14’ 51” N Longitude: 118° 52’ 48” W 006 Latitude: 46° 14’ 51” N Longitude: 118° 52’ 48” W 007 Latitude: 46° 14’ 52” N Longitude: 118° 52’ 48” W 008 Latitude: 46° 14’ 52” N Longitude: 118° 52’ 48” W 009 Latitude: 46° 14’ 53” N Longitude: 118° 52’ 49” W 010 Latitude: 46° 14’ 53” N Longitude: 118° 52’ 49” W 011 Latitude: 46° 14’ 54” N Longitude: 118° 52’ 49” W 012 Latitude: 46° 14’ 55” N Longitude: 118° 52’ 49” W 013 Latitude: 46° 14’ 55” N Longitude: 118° 52’ 49” W 014 Latitude: 46° 14’ 50” N Longitude: 118° 52’ 53” W 015 Latitude: 46° 14’ 48” N Longitude: 118° 52’ 47” W 016 Latitude: 46° 14’ 51” N Longitude: 118° 52’ 48” W 017 Latitude: 46° 14’ 51” N Longitude: 118° 52’ 48” W 018 Latitude: 46° 14’ 52” N Longitude: 118° 52’ 48” W 019 Latitude: 46° 14’ 52” N Longitude: 118° 52’ 48” W 020 Latitude: 46° 14’ 52” N Longitude: 118° 52’ 49” W 021 Latitude: 46° 14’ 52” N Longitude: 118° 52’ 49” W

Table 2. General Facility Information for Lower Monumental Lock and Dam

NPDES Permit #:	WA0026808
Applicant:	Lower Monumental Lock and Dam, USACE
Type of Ownership	Federal
Physical Address:	5220 Devil’s Canyon Road Kahlotus, Washington 99335
Mailing Address:	P.O. Box 10 Kahlotus, Washington 99335
Facility Contact:	Robert Witham (509) 282-7251
Operator Name:	USACE P.O. Box 10 Kahlotus, Washington 99335
Facility Location:	Latitude: 46° 33’ 51” N Longitude: 118° 32’ 26” W
Receiving Water	Snake River, Washington
Facility Outfalls	001 Latitude: 46° 33’ 51” N Longitude: 118° 32’ 26” W 002 Latitude: 46° 33’ 51” N Longitude: 118° 32’ 25” W 003 Latitude: 46° 33’ 51” N Longitude: 118° 32’ 26” W 004 Latitude: 46° 33’ 51” N Longitude: 118° 32’ 26” W 005 Latitude: 46° 33’ 50” N Longitude: 118° 32’ 25” W 006 Latitude: 46° 33’ 49” N Longitude: 118° 32’ 24” W 007 Latitude: 46° 33’ 48” N Longitude: 118° 32’ 23” W 008 Latitude: 46° 33’ 47” N Longitude: 118° 32’ 23” W 009 Latitude: 46° 33’ 46” N Longitude: 118° 32’ 21” W 010 Latitude: 46° 33’ 46” N Longitude: 118° 32’ 21” W 011a Latitude: 46° 33’ 51” N Longitude: 118° 32’ 25” W 011b Latitude: 46° 33’ 51” N Longitude: 118° 32’ 25” W 012 Latitude: 46° 33’ 45” N Longitude: 118° 32’ 35” W 013 Latitude: 46° 33’ 46” N Longitude: 118° 32’ 33” W

Table 3. General Facility Information for Little Goose Lock and Dam

NPDES Permit #:	WA0026786
Applicant:	Little Goose Lock and Dam, USACE
Type of Ownership	Federal
Physical Address:	1001 Little Goose Dam Road Dayton, Washington 99359
Mailing Address:	1001 Little Goose Dam Road Dayton, Washington 99359
Facility Contact:	Stephanie Thomas (509) 399-2233
Operator Name:	USACE 301 North 3rd Street Walla Walla, Washington 99362
Facility Location:	Latitude: 46° 34’ 59” N Longitude: 118° 1’ 34” W
Receiving Water	Snake River, Washington
Facility Outfalls	001 Latitude: 46° 34’ 59” N Longitude: 118° 1’ 34” W 002 Latitude: 46° 34’ 60” N Longitude: 118° 1’ 35” W 003 Latitude: 46° 34’ 58” N Longitude: 118° 1’ 34” W 004 Latitude: 46° 35’ 0” N Longitude: 118° 1’ 34” W 005 Latitude: 46° 35’ 1” N Longitude: 118° 1’ 35” W 006 Latitude: 46° 35’ 1” N Longitude: 118° 1’ 35” W 007 Latitude: 46° 35’ 2” N Longitude: 118° 1’ 35” W 008 Latitude: 46° 35’ 2” N Longitude: 118° 1’ 35” W 009 Latitude: 46° 35’ 3” N Longitude: 118° 1’ 35” W 010 Latitude: 46° 35’ 4” N Longitude: 118° 1’ 35” W 011 Latitude: 46° 35’ 9” N Longitude: 118° 1’ 40” W 012 Latitude: 46° 35’ 10” N Longitude: 118° 1’ 38” W 013 Latitude: 46° 34’ 58” N Longitude: 118° 1’ 31” W 014 Latitude: 46° 34’ 59” N Longitude: 118° 1’ 40” W 015 Latitude: 46° 34’ 58” N Longitude: 118° 1’ 42” W

Table 4. General Facility Information for Lower Granite Lock and Dam

NPDES Permit #:	WA0026794
Applicant:	Lower Granite Lock and Dam, USACE
Type of Ownership	Federal
Physical Address:	885 Almota Ferry Road Pomeroy, Washington 99133
Mailing Address:	885 Almota Ferry Road Pomeroy, Washington 99133
Facility Contact:	Marty Mendiola, Operations Manager (509) 843-1493
Operator Name:	USACE 885 Almota Ferry Road Pomeroy, Washington 99133
Facility Location:	Latitude: 46° 39’ 28” N Longitude: 117° 25’ 54” W
Receiving Water	Snake River, Washington
Facility Outfalls	001 Latitude: 46° 39’ 28” N Longitude: 117° 25’ 54” W 002 Latitude: 46° 39’ 28” N Longitude: 117° 25’ 54” W 003 Latitude: 46° 39’ 28” N Longitude: 117° 25’ 54” W 004 Latitude: 46° 39’ 28” N Longitude: 117° 25’ 54” W 005 Latitude: 46° 39’ 29” N Longitude: 117° 25’ 52” W 006 Latitude: 46° 39’ 30” N Longitude: 117° 25’ 51” W 007 Latitude: 46° 39’ 31” N Longitude: 117° 25’ 51” W 008 Latitude: 46° 39’ 32” N Longitude: 117° 25’ 51” W 009 Latitude: 46° 39’ 28” N Longitude: 117° 25’ 54” W 011 Latitude: 46° 39’ 32” N Longitude: 117° 25’ 50” W 012 Latitude: 46° 39’ 37” N Longitude: 117° 26’ 9” W 013 Latitude: 46° 39’ 39” N Longitude: 117° 26’ 9” W

B. Permit History

These are the first NPDES permits issued for the facilities. In July 2013, Columbia Riverkeeper filed a complaint in federal district court against the USACE for discharges of oil and grease without NPDES permits. On August 4, 2014, the USACE and Columbia Riverkeeper reached a Settlement Agreement where, among other things, the USACE agreed to submit NPDES permit applications for outfalls with potential pollutant discharges for the facilities listed above.

The USACE submitted NPDES permit applications to the U.S. Environmental Protection Agency Region 10 (EPA) on April 21, 2015 for all four hydroelectric generating projects. They also sent supplementary materials on August 29, 2018. The EPA has determined that the applications are complete.

C. Tribal Consultation

The EPA contacted tribal staff of the Cowlitz Tribe, Confederated Tribes of Warm Springs, Confederated Tribes of Grand Ronde, Nez Perce Tribe, Yakama Nation, and the Confederated Tribes of the Umatilla Reservation by electronic mail on August 8, 2018. On September 19, 2018, the EPA presented information on the permits to tribes, the Columbia River Inter-Tribal Fish Commission, Upper Columbia United Tribes, and the Upper Snake River Tribes Foundation. The

EPA mailed letters to each tribe on October 1, 2018 to inform them of the status of the NPDES permits for the Lower Snake River hydroelectric facilities and invite them to tribal consultation. The Yakama Nation and the CTUIR notified the EPA that they were interested in more coordination to inform them on whether to engage in formal government-to-government tribal consultation. The EPA is working with both tribes on potential formal tribal consultation and continues to provide regular updates on permit progress to all interested tribes and tribal organizations.

Because of the lapse of time since the EPA contacted tribes and invited them to tribal consultation, the EPA is resending letters on March 18, 2020 to reinitiate tribal consultation.

D. Geographic Area

The USACE owns and operates the four hydroelectric generating facilities that discharge to the Lower Snake River in Washington. These hydroelectric generating facilities are located in the following areas:

Facility	Location
Ice Harbor Lock and Dam	Burbank, Washington
Lower Monumental Lock and Dam	Kahlotus, Washington
Little Goose Lock and Dam	Dayton, Washington
Lower Granite Lock and Dam	Pomeroy, Washington

Appendix A includes maps of each facility

E. Facility Operations and Types of Discharges

The four facilities in this fact sheet are hydroelectric generating facilities. The hydroelectric generating facilities in the Lower Snake River include the generating station(s), dam(s), reservoir(s), navigation locks, canal system or tunnel system at certain facilities, and associated equipment and structures used in the generation of hydroelectric power. These hydroelectric generating facilities generate electricity through the use of falling or flowing water to drive turbines and generators; thus, the facilities have essentially the same type of operation and discharges. These facilities take in water from the Snake River. Most of the water is routed through turbines to generate electricity (See Figure 2.) However, some water is diverted internally and re-routed to cool equipment before being discharged through discrete outfalls (“cooling water”). Drainage sumps in hydroelectric generating facilities also collect water inside the facilities that include Snake River water leaking into the dam, turbine oil, and other water from equipment and floor drains, before being discharged through discrete outfalls (“equipment and floor drain-related water”). Unwatering sumps collect water when equipment submersed in water are being maintained or repaired and need to be dewatered (“equipment and facility maintenance-related water”). This water is also discharged through a discrete outfall. Hydroelectric generating water may be exposed to turbine oil and other oil and grease used to operate and lubricate turbines, wicket gates, lubricated wire rope, and other related equipment that can add pollutants when lubricants come into contact with water (“lubricants”). These are discharged in the tailrace. Lastly, cooling water intake structures (CWIS) may impinge or entrain fish that may be harmed (“CWIS”). Appendix A includes maps of each facility, outfall locations, and process diagrams for each of the outfall discharges. The following sections describe in more detail the types of discharges covered by these permits.

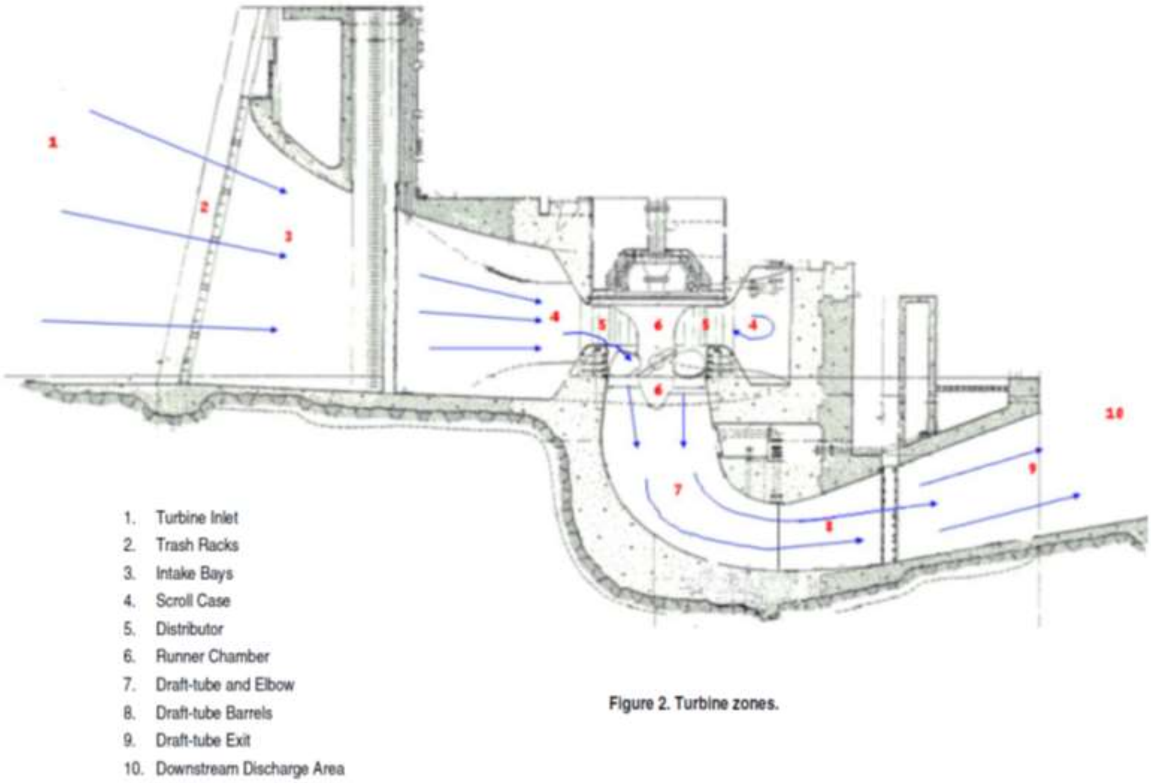

Figure 2. Cross-section of hydroelectric generating facility process

The permits authorize the discharges described above: cooling water, equipment and floor drain-related water, equipment and facility maintenance-related water, and lubricants.

Cooling Water Discharges, Backwash Strainers, and CWIS

Facilities use river water to cool equipment resulting in discharges of non-contact cooling water and direct cooling water to the river. Non-contact cooling water is defined as “water used for cooling which does not come into direct contact with any raw material, intermediate product, waste product or finished product” (40 CFR 401.11(n)). Non-contact cooling water is used in cooling the turbine bearings, guide bearings, air compressors, generators, HVAC chillers, and power transformers. At pump storage projects, non-contact cooling water is used in cooling additional equipment which includes the air compressors, air handlers, air conditioners, and rheostats. Direct cooling water is used to directly cool the bearings. A facility may divert certain equipment-related cooling waters to the equipment and floor drain water drainage system. Hydroelectric generating facilities may transfer heat from the equipment to cooling water. If there are holes in the pipes of the equipment being cooled, oil may enter the cooling water and be discharged. Thus, cooling water may include heat and oil and grease discharges. Some transformers may have legacy polychlorinated biphenyls (PCBs), which can be released with cooling water.

A separate equipment operation is the strainer operation on the cooling water intake line. These strainers intercept materials greater than 1/8” to ensure that material does not enter the generator and bearing heat exchangers where it could clog tubes. The four hydroelectric generating facilities have strainers, which are manually removed and cleaned.

Related to cooling water discharges are the CWIS. CWIS are the structure where water is extracted to be used to cool equipment in a facility. Hydroelectric generating facilities in the Lower Snake River extract river water for hydroelectric generating purposes, which are then routed internally for cooling water. The CWIS may have screens to remove debris, which fish can become impinged on. CWIS can harm organisms that are entrained into the facility and unable to pass through.

The permits do not address waters that flow over the spillway or pass through the turbines. *See National Wildlife Federation v. Consumers Power Company*, 862 F.2d 580 (6th Cir. 1988); *National Wildlife Federation v. Gorsuch*, 693 F.2d 156 (D.C. Cir. 1982). However, at the point that water is extracted for cooling water, its status moves from pass through water to cooling water, which is addressed in these permits. The CWIS in these hydroelectric generating facilities is the point where water is diverted from the scroll case to be used for cooling.

Equipment Drainage and Floor Drain Discharges

Equipment drainage and floor drain discharges are the collection of various points of internal station drainage discharges. Drainage is collected by floor drains, trench drains, wheel pit drains, station sumps, spillway sumps, and navigation locks sumps. These drainage collection systems drain water from compressor blowdowns, leakage from turbines and penstocks, grout gallery leakage, navigation lock leakage, housing leakage, packing boxes leakage, lower guide bearing and other bearing-related discharges, equipment and seal leakage, gate stems, turbine and scroll case access doors, tunnel pumpage, and water from ground water infiltration and surface water seepage. The station drainage system may include treatment units such as oil/water separators, oil flotation wells, or station sumps with some functioning as oil/water separators. These discharges can be intermittent and seasonal, and the outfalls in certain stations can be inaccessible for sampling purposes. Drainage sumps and dewatering sumps are the primary sources of potential oil and grease discharges in the hydroelectric facilities in the Lower Snake River. At some facilities, cooling water discharges may enter into equipment and floor drains, resulting in a commingled discharge, which could increase outfall water temperatures. Heat increases from commingled discharges are likely to be small or immeasurable, however, since most drainage water is leakage water or other water with temperature the same as leakage water.

Equipment and Facility Maintenance-Related Water Discharges

The equipment and facility maintenance-related water discharges include river water pumped from the facility during periods of equipment, station, and facility maintenance. In the Lower Snake River hydroelectric generating facilities, maintenance operations are generally continuous, and maintenance-related waters from unwatering sumps are discharged on a regular basis. During equipment maintenance operation, discharges occur from the dewatering of equipment containing river water such as the turbine, penstock, navigation locks, and dewatering sumps, which may contain residual oil and grease, detritus, or silt.

Lubricants

Various equipment in the hydroelectric generating facilities use equipment that are lubricated with grease. These include turbine oil used to operate and lubricate turbines. The Kaplan runner is part of the turbine in the Lower Snake River hydroelectric generating facilities that extends into the draft tube. The runner contains oil and can release oil similar to a controlled pitch propeller in vessels. Wicket gates, which control the amount of flow entering the scroll case to the turbine, and other equipment such as bearings, blocks, trucks and guides are also lubricated. Oil or grease that comes into contact with water may be released in the tailrace. Lubricated water rope may also come into contact with water during rainfall.

F. Types of Pollutants Associated with Facilities

These proposed permits address wastewater discharged from outfalls (*i.e.*, discharges that result in an addition of pollutants to the Lower Snake River). The permits do not address waters that flow over the spillway or pass through the turbines. *See National Wildlife Federation v. Consumers Power Company*, 862 F.2d 580 (6th Cir. 1988); *National Wildlife Federation v. Gorsuch*, 693 F.2d 156 (D.C. Cir. 1982). The pollutants associated with wastewaters from the above discharges are oil, grease, excess heat (temperature), pH, and PCBs.

Most discharges that affect water quality are ancillary to the direct process of generating electricity at a hydroelectric generating facility and result mostly from oil spills, equipment leaks, and improper waste storage. These NPDES permits propose permit limits for oil and grease and pH and temperature monitoring for cooling water discharges. The permits also require development and implementation of a Best Management Practices (BMP) Plan and Annual Report, Environmentally Acceptable Lubricants (EAL) Plan and Annual Report, PCB Management Plan and Annual Report, and CWIS Annual Report. The BMP Plan establishes practices and procedures to prevent, minimize or eliminate the discharge of oil and grease. The BMP Annual Report requires an update of BMPs installed, an evaluation of their effectiveness, and a description of how BMPs will be optimized to address oil and grease discharges. The USACE has developed oil spill prevention plans, oil tracking accountability plans, analysis, and evaluation reports to comply with other environmental regulations. These plans may be used to comply with part or all of the BMP Plan, so long as the conditions required in the BMP Plan are met, and USACE provides documentation and references to how other reports meet the permit conditions.

EALs are biodegradable lubricants. For equipment that use non-EAL lubricants, have an oil-water interface, or have a high likelihood that lubricants would enter into water, the permits require the use of EALs, unless technically infeasible. The permits also require an EAL Annual Report, which is an inventory of equipment that should be considered for EALs, a technical feasibility evaluation of the equipment, and annual updates of EAL implementation on equipment. (See VI.C.) The USACE has conducted numerous EAL analyses as part of its internal efforts to move towards EALs and as part of its settlement agreement with Columbia Riverkeeper. These reports may be used to meet part or all of the EAL Annual Report as long as the permit conditions are met, and USACE provides documentation and references to how other reports meet the permit conditions.

Section 316(b) of the Clean Water Act (CWA) requires the use of best technology available (BTA) to minimize adverse environmental effects from CWIS. As such, the permits require best technology available (BTA) to be used to ensure that these effects are minimized. The permits also require a CWIS Annual Report, which is a status report of the BTA and any studies and optimization related to the use and effectiveness of the BTA on fish mortality. USACE is required to take action to maintain and improve fish passage under the Endangered Species Act (ESA). These include implementation actions, reports, and an evaluation of the effectiveness of their implementation. These reports may be used to meet part or all of the EAL Annual Report as long as the permit conditions are met, and USACE provides documentation and references to how other reports meet the permit conditions.

G. Type of Treatment

The Lower Snake River hydroelectric generating facilities use planning, tracking, and monitoring protocols to prevent and detect oil releases. For equipment and floor drain related discharges at hydroelectric generating facilities, the facilities also use gravity oil/water separators on sumps.

These oil/water separators use the force of gravity to separate the lower density oils as a layer on top of the oil/water interface and the heavier particulate matter (sludge) as a layer on the bottom of the oil/water separator. The design of oil/water separators is based on the following parameters: water flow rate, density of oil to be separated, desired oil removal capacity, and operating temperature range.

H. Outfall Description

Below are brief descriptions of outfalls that discharge in Washington waters for each facility. Appendix A provides the process diagrams for each outfall.

Table 5. Ice Harbor Lock and Dam Outfall Description

Outfall	Outfall Description	Type of Discharge	Maximum Daily Discharge
001	Navigation Lock Sump 3	Equipment and floor drain discharges, maintenance-related discharges	2.2 MGD
002	Navigation Lock Pump 4	Equipment and floor drain discharges, maintenance-related discharges	2.2 MGD
003	Navigation Lock Pump 8	Equipment and floor drain discharges, maintenance-related discharges	0.72 MGD
004	South Fish Pumphouse Pump 9	Equipment and floor drain discharges, maintenance-related discharges, cooling water	2.2 MGD
005	Main Unit 1 Air Cooler non-contact cooling water	Cooling water	1.7 MGD
006	Main Unit 1 Thrust Bearing non-contact cooling water	Cooling water	0.17 MGD
007	Main Unit 2 Air Cooler non-contact cooling water	Cooling water	1.7 MGD
008	Main Unit 2 Thrust Bearing non-contact cooling water	Cooling water	0.17 MGD
009	Main Unit 3 Air Cooler non-contact cooling water	Cooling water	1.7 MGD
010	Main Unit 3 Thrust Bearing non-contact cooling water	Cooling water	0.17 MGD
011	Main Unit 4 Non-contact cooling water	Cooling water	2.8 MGD
012	Main Unit 5 Non-contact cooling water	Cooling water	2.8 MGD
013	Main Unit 6 Non-contact cooling water	Cooling water	2.8 MGD
014	Combined drainage and unwatering sump pumps	Equipment and floor drain discharges, maintenance-related discharges	15 MGD
015	HVAC System	Cooling water	1.6 MGD
016	Transformer Oil Cooler 1-1	Cooling water	0.94 MGD
017	Transformer Oil Cooler 1-2	Cooling water	0.29 MGD
018	Transformer Oil Cooler 1-3	Cooling water	0.29 MGD
019	Transformer Oil Cooler 1-4	Cooling water	0.29 MGD
020	Transformer Oil Cooler 1-5	Cooling water	0.29 MGD
021	Transformer Oil Cooler 1-6	Cooling water	0.29 MGD

Table 6. Lower Monumental Lock and Dam Outfall Description

Outfall	Outfall Description	Type of Discharge	Maximum Daily Value
001	Drainage sump	Maintenance-related discharges, equipment and floor drain discharges, cooling water	2.9 MGD
002	Unwatering sump	Equipment and floor drain discharges, maintenance-related discharges, cooling water	11 MGD
003	Heat pump outfall	Cooling water	1.8 MGD
004	Emergency diesel generator cooling water discharge	Cooling water	0.65 MGD
005	Main Unit 1 Cooling water	Cooling water	2.2 MGD
006	Main Unit 2 Cooling water	Cooling water	2.2 MGD
007	Main Unit 3 Cooling water	Cooling water	2.2 MGD
008	Main Unit 4 Cooling water	Cooling water	1.7 MGD
009	Main Unit 5 Cooling water	Cooling water	1.7 MGD
010	Main Unit 6 Cooling water	Cooling water	1.7 MGD
011	Station Service Transformer T01 oil cooler discharge	Cooling water	0.026 MGD
011b	Station Service Transformer T02 oil cooler discharge	Cooling water	0.026 MGD

Table 7. Little Goose Lock and Dam Outfall Description

Outfall	Outfall Description	Type of Discharge	Maximum Daily Value
001	Drainage sump	Maintenance-related discharges, equipment and floor drain discharges, cooling water	1.7 MGD
002	Unwatering sump	Equipment and floor drain discharges, maintenance-related discharges, cooling water	13 MGD
003	Heat pump outfall	Cooling water	0.86 MGD
004	Emergency diesel generator cooling water discharge	Cooling water	0.043 MGD
005	Main Unit 1 Cooling water	Cooling water	2.8 MGD
006	Main Unit 2 Cooling water	Cooling water	2.8 MGD
007	Main Unit 3 Cooling water	Cooling water	2.4 MGD
008	Main Unit 4 Cooling water	Cooling water	2.4 MGD
009	Main Unit 5 Cooling water	Cooling water	2.4 MGD
010	Main Unit 6 Cooling water	Cooling water	2.4 MGD
011	North shore generator drain	Cooling water	0.0023 MGD
012	North shore pump 2 drain	Cooling water	0.81 MGD
013	Navigation lock fill valve sump	Equipment and floor drain discharges, maintenance-related discharges	0.0029 MGD
014	Visitors center A/C drain	Cooling water	0.0187 MGD
015	Navigation lock drainage sump	Equipment and floor drain discharges, maintenance-related discharges, cooling water	8.1 MGD

Table 8. Lower Granite Lock and Dam and Lock Outfall Description

Outfall	Outfall Description	Type of Discharge	Maximum Daily Value
001	Drainage sump	Maintenance-related discharges, equipment and floor drain discharges, cooling water	2.9 MGD
002	Unwatering sump	Equipment and floor drain discharges, maintenance-related discharges, cooling water	11 MGD
003	Main Unit 1 Cooling Water	Cooling water	3.2 MGD
003a	Emergency diesel generator cooling water discharge	Cooling water	0.079 MGD
004	Main Unit 2 Cooling water	Cooling water	1.7 MGD
005	Main Unit 3 Cooling water	Cooling water	1.7 MGD
006	Main Unit 4 Cooling water	Cooling water	1.7 MGD
007	Main Unit 5 Cooling water	Cooling water	1.7 MGD
008	Main Unit 6 Cooling water	Cooling water	1.7 MGD
009	Heat pumps	Cooling water	0.0023 MGD
011	Central non-overflow drainage sump 1	Cooling water	1.8 MGD
012	Central non-overflow drainage sump 2	Equipment and floor drain discharges, maintenance-related discharges	1.8 MGD

I. Effluent Characterization

To characterize the effluent, the EPA evaluated the facility's application form and additional data provided by ODEQ and the facilities. The table below summarizes information from the permit application. Data are limited, and in all but a few outfalls in the Little Goose Lock and Dam, there is one sample point per outfall. All data are provided in Appendix B.

Table 9. Summary of Pollutants Detected in Outfalls

Ice Harbor Lock and Dam	
Pollutant	**Concentration range**
Biochemical oxygen demand (BOD)	6.3 mg/L – 9.8 mg/L
Total suspended solids (TSS)	2.6 mg/L – 15 mg/L
Total residual chlorine (TRC)	0.057 mg/L
Oil and grease	0.057 mg/L – 4.1 mg/L
Chemical oxygen demand (COD)	4.4 mg/L – 19 mg/L
Total organic carbon (TOC)	1.5 mg/L – 6.8 mg/L
Ammonia	0.32 mg/L - 0.48 mg/L
Temperature (summer)	15 - 26^{o}C
pH	7.0 – 8.5 s.u.

Lower Monumental Lock and Dam	
Pollutant	**Concentration range**
Biochemical oxygen demand (BOD)	2.8 mg/L
Total suspended solids (TSS)	2.8 mg/L - 74 mg/L
Total residual chlorine (TRC)	0.072 mg/L
Oil and grease	1.2 mg/L– 1.3 mg/L
Chemical oxygen demand (COD)	8.4 mg/L – 71 mg/L
Total organic carbon (TOC)	1.6 mg/L – 2.4 mg/L
Ammonia	0.31 mg/L - 0.38 mg/L
Temperature (summer)	17 - 23^{o}C
pH	7.0 – 9.0 s.u.

Little Goose Lock and Dam	
Pollutant	**Concentration range**
Biochemical oxygen demand (BOD)	3.7 mg/L – 18 mg/L
Total suspended solids (TSS)	1 mg/L - 37 mg/L
Total residual chlorine (TRC)	0.06 mg/L – 0.09 mg/L
Oil and grease	1.2 mg/L – 1.3 mg/L
Chemical oxygen demand (COD)	1.1 mg/L – 61 mg/L
Total organic carbon (TOC)	0.2 mg/L – 76 mg/L
Ammonia	0.06 mg/L - 0.19 mg/L
Temperature (summer)	15 - 28^{o}C
pH	7.0 – 8.0 s.u.

Lower Granite Lock and Dam	
Pollutant	**Concentration range**
Biochemical oxygen demand (BOD)	5.4 mg/L – 10 mg/L
Total suspended solids (TSS)	1 mg/L - 7 mg/L
Oil and grease	1.3 mg/L
Chemical oxygen demand (COD)	5.9 mg/L – 20 mg/L
Total organic carbon (TOC)	1.1 mg/L – 4.6 mg/L
Ammonia	0.06 mg/L – 0.17 mg/L
Temperature (summer)	17 - 34^{o}C
pH	6.5 – 8.0 s.u.

J. Compliance History

The proposed permits are new so there are no past permit violations. However, the facilities are currently discharging without a permit. As previously explained, on August 4, 2014, the USACE and Columbia Riverkeeper reached a Settlement Agreement where, among other things, the USACE agreed to submit NPDES permit applications for outfalls with potential pollutant discharges for, among other facilities, the four facilities that discharge to the Lower Snake River.

II. Receiving Water

In drafting permit conditions, the EPA must analyze the effect of the facility’s discharge on the receiving water. The details of that analyses are provided in this Fact Sheet. This section summarizes characteristics of the receiving water that impact that analysis.

A. Receiving Water

These facilities discharge to the Lower Snake River. Ice Harbor Lock and Dam discharges near river mile 9.7 of the Snake River near the City of Burbank, Washington. Lower Monumental Lock and Dam discharges near river mile 41.6 of the Snake River near the City of Kahlotus, Washington. Little Goose Lock and Dam discharges near river mile 70.3 of the Snake River near the City of Dayton, Washington. Lower Granite Lock and Dam discharges near river mile 107.5 of the Snake River near the City of Pomeroy, Washington.

The Lower Snake River flows change depending on the location and time of year. The 2011-2016 average hydrographs for the Lower Snake River dams peak at over 100 kilo cubic feet per second (kcfs) in May and are as low as 25 kcfs on average in the late fall. The lowest ambient river flows throughout the system generally occur between September and January. Just as there is tremendous flow variation throughout a given year, there is also tremendous variation in flow between years, illustrated in Figures 3 to 5 by the individual years in color.

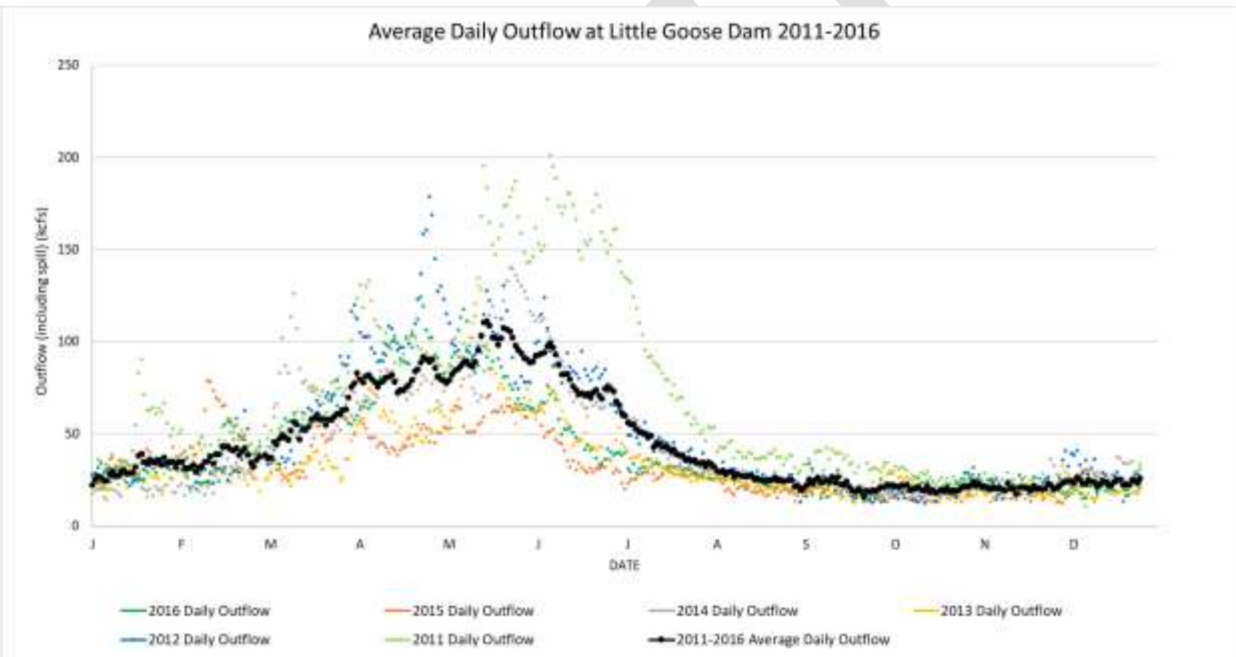

Figure 3. Average daily outflow, including spill, at Little Goose Dam between 2011-2016 (black), with each year plotted in color to illustrate variation between years. Data source: Columbia River DART

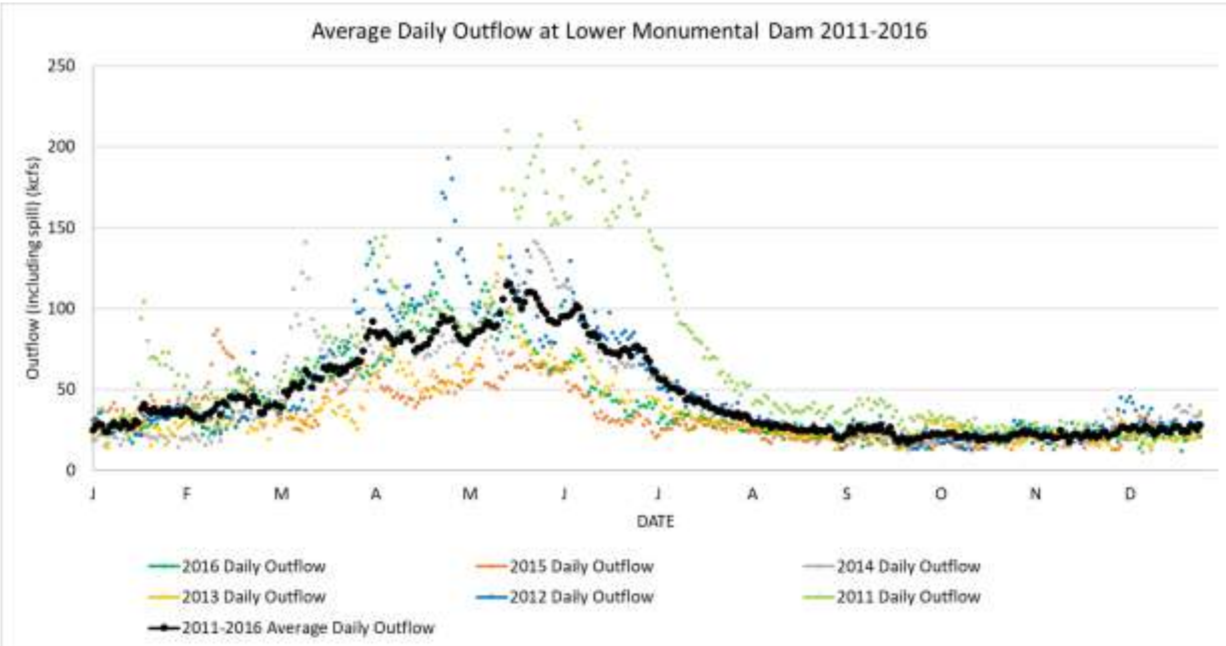

Figure 4. Average daily outflow, including spill, at Lower Monumental Dam between 2011-2016 (black), with each year plotted in color to illustrate variation between years. Data source: Columbia River DART

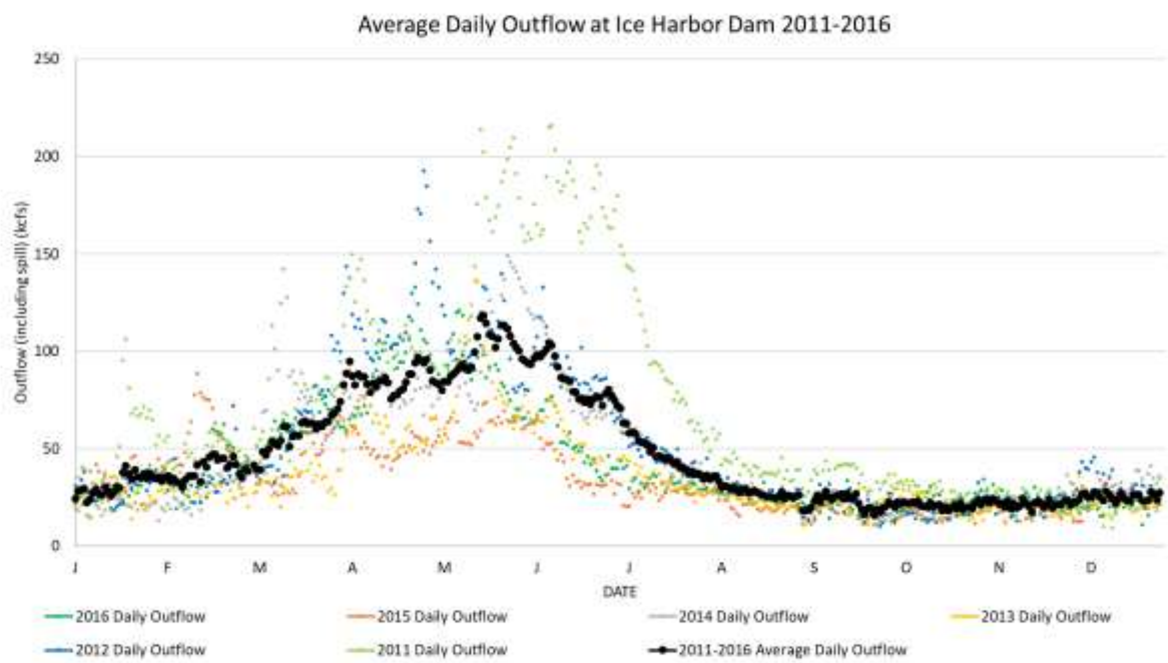

Figure 5. Average daily outflow, including spill, at Ice Harbor Dam between 2011-2016 (black), with each year plotted in color to illustrate variation between years. Data source: Columbia River DART

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. 40 CFR 122.4(d) requires that the conditions in NPDES permits ensure compliance with the water quality standards of all affected States and Tribes. A State's or Tribe's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria and an anti-degradation policy.

The use classification system designates the beneficial uses that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

B. Designated Beneficial Uses

The facilities discharge to the Lower Snake River from river mile 9.7 to river mile 107.5. At the points of discharge, the Lower Snake River is protected for the following designated uses in Washington (WAC 173-201A-602, Table 602, Water Resources Inventory Area 33): spawning and rearing, primary contact, domestic water, industrial water, agricultural water, stock water, wildlife habitat, harvesting, commerce/navigation, boating, and aesthetics.

C. Surface Water Quality Criteria

The criteria are found in the following sections of the Washington Water Quality Standards:

- The numeric and narrative criteria applicable to all fresh waters of the State are found in WAC 173-201A-200 (Fresh water designated uses and criteria) and WAC 173-201A-260 (Natural conditions and other water quality criteria and applications).
- The numeric and narrative criteria for toxic substances for the protection of aquatic life and primary contact recreation are found at WAC 173-201A-240.
- Water quality criteria for agricultural water supply can be found in the EPA's Water Quality Criteria 1972, also referred to as the "Blue Book" (EPA R3-73-033)

The permits contain language for the following narrative criteria:

Toxic Substances. Toxic substances shall not be introduced above natural background levels in waters of the state which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic toxicity to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (WAC 173-201A-240).

Deleterious, floating, suspended, submerged matter, aesthetics, visible oil sheen. Toxic, radioactive, or deleterious material concentrations must be below those which have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health (WAC 173-201A-260(2)(a)).

Aesthetic values must not be impaired by the presence of materials of their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste (WAC 173-201A-260-2(b)).

D. Impaired Waters/TMDLs

Section 303(d) of the CWA requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations by point sources. For all 303(d)-listed water bodies and pollutants, states must develop and adopt total maximum daily loads (TMDLs) that will specify wasteload allocations (WLAs) for point sources and load allocations (LAs) for non-point sources, as appropriate. WLAs for point sources are implemented through limitations incorporated into NPDES permits that are consistent with the assumptions of the WLAs in the TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Toxics

In 1991, Ecology and ODEQ issued a TMDL for dioxins in the Columbia River Basin, which included some portions of the Snake River. The TMDL identified the major sources of dioxin as pulp mills that were operating during the development of the TMDL. Dioxins are usually a result of chemical processes at high temperatures. Since no chemical processes at high temperatures occur at the hydroelectric generating facilities, dioxins are not expected to be present in the discharges from the facilities. In 2009, the EPA issued a report on toxics in the Columbia River Basin. It states that in 1991, there were 13 paper mills that were sources of dioxin. These facilities changed their leaching processes to reduce dioxin releases, and there have been significant reductions of dioxin in fish, confirming that the pulp mills were the major sources of dioxin in the Columbia River. The Snake River is also impaired for 4,4’-DDE, dieldrin, hexachlorobenzene, toxaphene, and mercury. None of these pollutants are known to be part of hydroelectric generating facilities. The EPA has taken a conservative approach and included Part I.B.2 of the permits, which prohibits the discharge of toxic substances in concentrations that impair beneficial uses.

The Lower Snake River is listed as impaired for PCBs in freshwater fish on Ecology’s CWA Section 303(d) list.

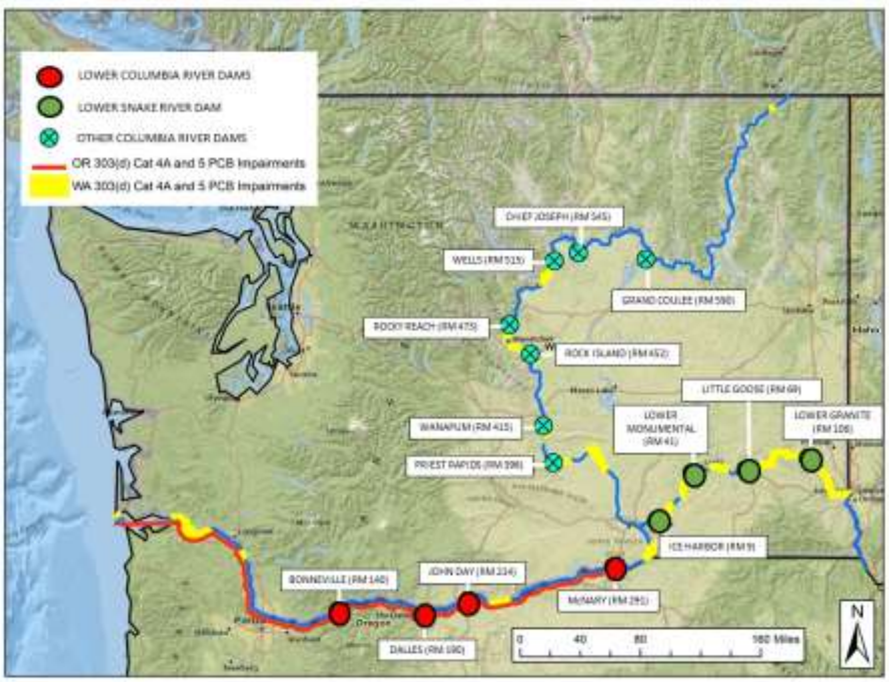

Figure 6. PCB Impairments on the Lower Columbia and Lower Snake Rivers

PCBs may be present in transformers and other equipment, at the hydroelectric generating facilities. When those sources come into contact with water, it is possible to have discharges of PCBs into the Snake River.

The permits require a PCB Plan and PCB Annual Report. The PCB Plan must describe PCB monitoring that has been completed and the PCB sources that could come into contact with water and be discharged. The PCB Plan must also identify the actions USACE is taking to prevent, track, and address PCB releases. The PCB Annual Report must describe how the permittee is implementing the PCB Plan, evaluate the effectiveness of actions, and propose any new steps that must be taken to optimize effectiveness.

The EPA has also taken a conservative approach and included provisions in the permits that prohibit the discharge of PCBs and the discharge of toxic substances in concentrations that impair the beneficial uses of the receiving water. The permits also require the hydroelectric projects to use lubricants, paint and caulk that do not contain PCBs, unless technically infeasible.

Total Dissolved Gas

In August 2003, Ecology issued a TMDL for total dissolved gas in the Lower Snake River. Elevated total dissolved gas is caused by spill events, when quickly flowing water entrains total dissolved gas at high levels. In the case of hydroelectric generating facilities, these spill events are "pass through" water, which are not regulated by NPDES permits (*See National Wildlife Federation v. Consumers Power Company*, 862 F.2d 580 (6th Cir. 1988); *National Wildlife Federation v. Gorsuch,* 693 F.2d 156 (D.C. Cir. 1982). Total dissolved gas is not a pollutant found in the discharges covered under the permits. Therefore, total dissolved gas is not a pollutant of concern for the discharges authorized by these permits.

Temperature

The Snake River is listed as impaired for temperature on Ecology's CWA Section 303(d) list. Figure 7 shows temperature impairments in the Lower Columbia and Lower Snake Rivers. Since a TMDL has not been finalized, the EPA evaluated potential temperature impacts from the four federal hydroelectric facilities. Cooling water discharges from the hydroelectric generating facilities may affect temperature. However, the effects may be small, since these discharges combine with water passed over spillways. The hydroelectric generating facilities have limited temperature data on their cooling water discharges, in most cases, one sample per outfall.

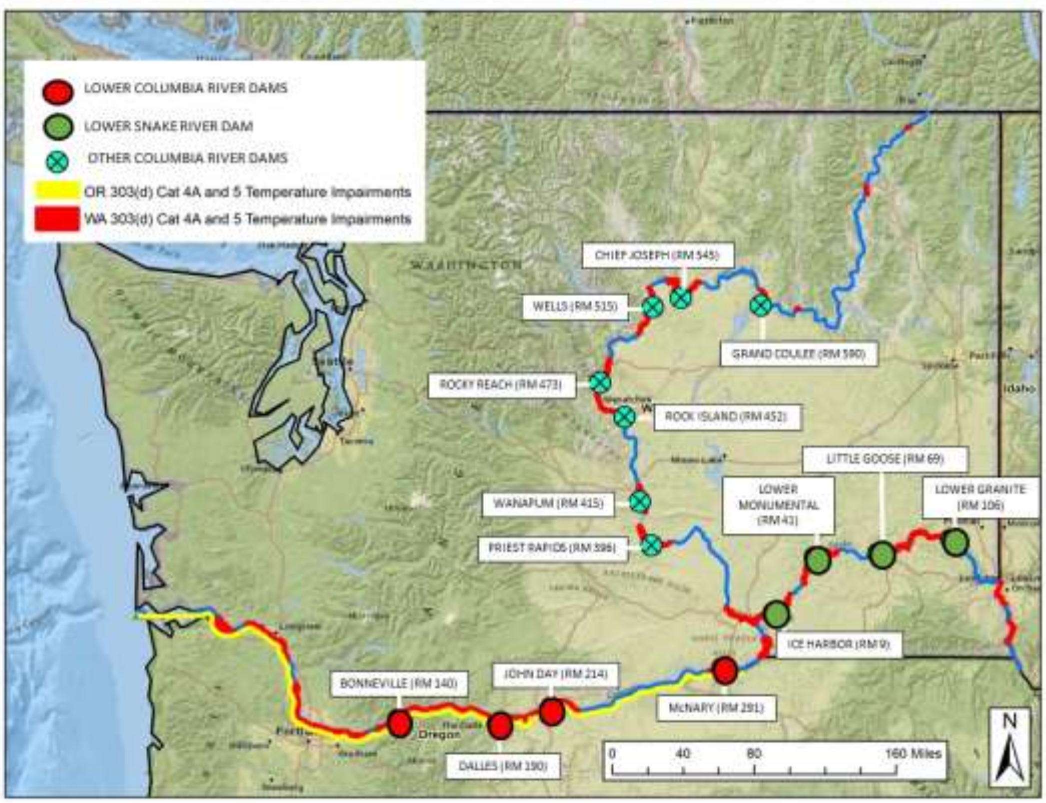

Figure 7. Temperature Impairments on the Lower Columbia River and Lower Snake River

Washington's numeric temperature water quality criteria (WQC) in the Lower Snake and Lower Columbia River is 20°C daily maximum. Snake River temperatures are the influent temperatures for these facilities and vary by season and location. This is important because the hydroelectric facilities are run of the river dams, which means that effluent temperatures are strongly influenced by the influent Snake River temperatures.

The EPA evaluated the temperature impacts from the facilities with the available data. The EPA made conservative assumptions that all outfalls were discharging at design flow at the same time. The EPA then took the flow-weighted average temperature of the outfalls and subtracted the influent temperature allowing full mixing with the Snake River. The EPA used the minimum Snake River flow measured downstream of each facility from 2011-2016. Even using the minimum Snake River flows, the amount of dilution is significant because the Snake River flows are greater than facility discharges. Table 10 shows that given the limited data set, the hydroelectric generating facilities' permitted discharges have minimal impacts on temperatures in the Snake River, primarily because of dilution and effluent temperatures. In addition, note that influent temperatures are highly variable by depth. This evaluation is consistent with preliminary Columbia River temperature TMDL models that show minimal impact on temperature from point sources.

Table 10. Temperature impacts from Lower Snake River hydroelectric generating facilities with limited data

Facility	Facility Total Design Flow (MGD)	Downstream Lower Snake River Flow (MGD)	Proportion of Facility Discharge Flow to Snake River Flow	Influent temperature in Snake River (ºC)	Facility Effluent flow-weighted average temperature (ºC)	Temperature increase from facility with full dilution (ºC)
Ice Harbor Lock and Dam	40	5791	0.69%	22.1	21.4	No increase
Lower Monumental Lock and Dam	28	6844	0.41%	18.0	17.2	No increase
Little Goose Lock and Dam	40	6657	0.60%	18.2	19.4	0.0072ºC
Lower Granite Lock and Dam	29	8215	0.35%	24.9	20.2	no increase

However, temperature is important in the Snake River with respect to threatened and endangered salmon. With a limited data set, more information will help better characterize the effects of the permitted discharges. Therefore, the permits require continuous temperature influent and effluent monitoring for cooling water discharges and monthly temperature monitoring where a similar cooling water discharge requires continuous temperature monitoring. The permit also requires the permittee to submit a Temperature Data Report with the next permit application that includes the monthly instantaneous maximum, the maximum daily average, and 7-day average daily maximum (7-DADM) influent and effluent temperatures measured at each outfall.

Impairments Downstream of Lower Monumental Lock and Dam

Lake Sacajawea on the Snake River is downstream of Lower Monumental Lock and Dam and is impaired for 4,4'-DDE, dioxin, dieldrin, PCBs, total chlordane, toxaphene, and dissolved oxygen. Previous sections address toxics impairments. Dissolved oxygen impairments can be a result of many factors including oxygen-demanding substances. The Lower Monumental Lock and Dam has one outfall with a high chemical oxygen demand (COD) concentration. However, the discharge is from a heat pump which is not expected to add or concentrate organic material. Therefore, the permit requires quarterly COD monitoring in influent and effluent to assess the frequency and magnitude of COD levels at the outfall. This information will be used in the next permit cycle to determine whether limits and/or additional BMPs are needed.

Impairments Downstream of Lower Granite Lock and Dam

Bryan Lake on the Snake River is downstream of Lower Granite Lock and Dam and is impaired for dissolved oxygen, total dissolved gas, total chlordane, and temperature. Previous sections address toxics, total dissolved gas, temperature impairments. Dissolved oxygen impairments can be a result of many factors including oxygen-demanding substances. Lower Granite Lock and Dam has relatively low levels of oxygen-demanding materials. Of the hydroelectric generating facilities' operations, sumps might be expected to concentrate oxygen-demanding materials although the majority of water is from leakage into the dam from river water. The permit does not require limits or monitoring for oxygen-demanding materials. However, the BMP Plan requires the facility to minimize sediment, through regular cleanings and inspections of trash racks, as well as preventing and minimizing oil spills, which at high concentrations may deplete oxygen.

III. Effluent Limitations and Monitoring

The tables below show the effluent limits for each facility:

Table 11. Ice Harbor Lock and Dam Proposed Effluent Limitations and Monitoring

Effluent Limitation and Monitoring Requirements for Outfalls 001, 002 003, 004, and 014: Navigation Lock Pumps, South Fish Pumphouse Pump, Combined Drainage and Unwatering Sump Pumps

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.

Effluent Limitations and Monitoring Requirements for Outfalls 005, 006, 007, 008, 009, 010, 011, 012, 013, 016, 017, 018, 019, 020, and 021: Main Units Non-Contact Cooling Water, Transformer Non-Contact Cooling Water

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	^{o}C	Report 7DADM[2], daily maximum, and daily average.	See Paragraph I.B.10 of this permit.	Continuous or 1/month [3]	Measurement/Calculation
Visible Oil, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitations and Monitoring Requirements for Outfall 015: HVAC Chiller

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Total Suspended Solids	mg/L	Report	Influent and Effluent	1/quarter	Grab
Temperature	^oC	Report 7DADM[2], daily maximum, and daily average.	Effluent	Continuous or 1/month[3]	Measurement/Calculation
Visible Oil, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Table 12. Lower Monumental Lock and Dam Proposed Effluent Limitations and Monitoring

Effluent Limitation and Monitoring Requirements for Outfalls 001 and 002: Drainage Sump, Unwatering Sump

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	ºC	Report 7DADM[2], daily maximum, and daily average.	Effluent	Continuous or 1/month[3]	Measurement/Calculation
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes

2. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
3. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
4. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitations and Monitoring Requirements for Outfalls 003: Heat Pump

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Total Suspended Solids	mg/L	Report	Influent and Effluent	1/quarter	Grab
Temperature	ºC	Report 7DADM[2], daily maximum, and daily average.	Effluent	Continuous or 1/month[3]	Measurement/ Calculation

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitations and Monitoring Requirements for Outfall 004: Emergency Diesel Generator Cooling Water

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	^{o}C	Report 7DADM[2], daily maximum, and daily average.	Effluent	Continuous or 1/month[3]	Measurement/Calculation
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitations and Monitoring Requirements for Outfalls 005, 006, 007, 008, 009, 010, 011, and 011b: Main Units Non-Contact Cooling Water, Transformer Non-Contact Cooling Water

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	ºC	Report 7DADM[2], daily maximum, and daily average.	See Paragraph I.B.10 of this permit.	Continuous or 1/month[3]	Measurement/Calculation
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes

1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Table 13. Little Goose Lock and Dam Proposed Effluent Limitations and Monitoring

Effluent Limitations and Monitoring Requirements for Outfalls 001, 002, 011, and 012: Unwatering Sump, Drainage Sump, North Shore Generator Drain, and North Shore Pump Drain

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	°C	Report 7DADM[2], daily maximum, and daily average.	Effluent	Continuous or 1/month[3]	Measurement/Calculation
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitations and Monitoring Requirements for Outfalls 003, 004, 005, 006, 007, 008, 009, 010, and 014: Heat Pump Water, Emergency Diesel Generator Cooling Water, Main Units Non-Contact Cooling Water, and Visitors Center A/C Drain

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	°C	Report 7DADM[2], daily maximum, and daily average.	See Paragraph I.B.10 of this permit.	Continuous or 1/month[3]	Measurement/ Calculation

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitation and Monitoring Requirements for Outfall 013: Navigation Lock Fill Valve Sump

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Chemical Oxygen Demand	mg/L	Report	Influent and Effluent	1/quarter	Grab
Total Suspended Solids	mg/L	Report	Influent and Effluent	1/quarter	Grab
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.

Effluent Limitation and Monitoring Requirements for Outfall 015: Navigation Lock Drainage Sump

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	**Sample Frequency**	**Sample Type**
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Chemical oxygen demand	mg/L	Report	Influent and effluent	1/quarterly	Grab
Temperature	^{o}C	Report 7DADM[2], daily maximum, and daily average.	Effluent	Continuous or 1/month[3]	Measurement/Calculation
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes

1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Table 14. Lower Granite Lock and Dam Proposed Effluent Limitations and Monitoring

Effluent Limitations and Monitoring Requirements for Outfalls 001 and 002: Drainage Sump, Unwatering Sump

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	ºC	Report 7DADM[2], daily maximum, and daily average.	Effluent	Continuous or 1/month[3]	Measurement/Calculation
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes

1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitations and Monitoring Requirements for Outfalls 003, 003a, 004, 005, 006, 007, 008, and 009: Main Units Non-Contact Cooling Water, Emergency Diesel Generator Non-Contact Cooling, Heat Pump Cooling Water

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Temperature	ºC	Report 7DADM[2], daily maximum, and daily average.	See Paragraph 1.B.10 of this permit.	Continuous or 1/month[3]	Measurement/ Calculation

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.
2. 7-day average daily maximum. This is a rolling 7-day average calculated by taking the average of the daily maximum temperatures. The 7-day average daily maximum for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
3. See Paragraphs I.B.10 and I.B.11. In the first six months of the effective date of the permit, monthly sampling is required, Continuous monitoring is required after the first six months of the effective date of the permit.

Effluent Limitation and Monitoring Requirements for Outfalls 011 and 012: Central Non-Overflow (CNO) Drainage Sumps

Parameter	Units	Effluent Limitations	Monitoring Requirements		
			Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits					
pH	std units	Between 6.5 – 8.5	Effluent	1/week or 1/month[1]	Grab
Oil and grease	mg/L	5 (daily maximum)	Effluent	1/week or 1/month[1]	Grab
Report Parameters					
Flow	mgd	Report	Effluent	1/month	Measurement
Visible Oil Sheen, Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.4 of this permit.			Visual Observation

Notes
1. In the first year of the permit, if there are no exceedances of the pH limit or detection of oil and grease, the required monitoring frequency for that pollutant is reduced to 1/month. If there are exceedances/detections in the first year of the permit, the frequency will remain 1/week for the remainder of the permit term.

A. Statutory Requirements for Determining Effluent Limitations

Section 301(a) of the CWA, prohibits the discharge of pollutants to waters of the United States unless the discharge is authorized pursuant to an NPDES permit. Section 402 of the CWA authorizes the EPA, or an approved state NPDES program, to issue NPDES permits that authorize discharges subject to limitations and requirements imposed pursuant to CWA Sections 301, 304, 306, 401 and 403. Accordingly, NPDES permits typically include effluent limits and requirements that require the permittee to (1) meet national standards that reflect levels of currently available treatment technologies; (2) comply with the EPA-approved state water quality standards in state waters; and (3) prevent unreasonable degradation of the surface water quality.

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either technology-based effluent limits or water quality-based effluent limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

The EPA first determines which technology-based effluent limits apply to a discharge in accordance with applicable national effluent limitation guidelines and standards (ELGs). Where ELGs have not been promulgated for a specific category of discharge, case-by-case technology-based effluent limits based on best professional judgment (BPJ) are developed. The EPA further determines which water quality-based effluent limits apply to a discharge based upon an assessment of the pollutants discharged and a review of state water quality standards. Monitoring requirements must also be included in the permit to determine compliance with effluent limitations. Effluent and ambient monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality.

B. Pollutants of Concern

Pollutants of concern are those that either have technology-based effluent limits or may need water quality-based limits. The EPA identifies pollutants of concern for the discharge based on those which:

- Have a technology-based limit
- Have an assigned WLA from a TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring. Monitoring data are reported in the application and DMR and any special studies
- Are expected to be in the discharge based on the nature of the discharge

A review of the discharges of hydroelectric generating facilities permitted by other states and information gathered from the permit applications, facilities, and other sources reveal that the pollutants of concern are as follows:

- pH
- oxygen demanding pollutants (BOD and COD)
- oil and grease
- toxics
- temperature
- total suspended solids (TSS)

C. Technology-based Effluent Limitations

Section 301(b) of the CWA requires technology-based controls on effluents. All NPDES permits must contain effluent limitations which: (a) control toxic pollutants and nonconventional pollutants through the use of “best available technology economically achievable” (BAT), and (b) control conventional pollutants through the use of “best conventional pollutant control technology” (BCT). In no case may BAT or BCT be less stringent than the “best practical control technology currently achievable” (BPT), which is the minimum level of control required by Section 301(b)(1)(A) of the CWA.

ELGs have not yet been developed by the EPA for hydroelectric generating facility discharges.

D. Water Quality-based Effluent Limitations

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. NPDES permits for discharges to State or Tribal waters must also include more stringent conditions imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. 40 CFR 122.44(d)(1) requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)).

The regulations require the permitting authority to make this evaluation using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met and must be consistent with any available WLA for the discharge in an approved TMDL. If there are no approved TMDLs that specify WLAs for this discharge, all of the water quality-based effluent limits are calculated directly from the applicable water quality standards.

Reasonable Potential Analysis and Need for Water Quality-Based Effluent Limits

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (*TSD*) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit.

In some cases, a dilution allowance or mixing zone is permitted. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and within which certain water quality criteria may be exceeded (EPA, 2014). While the criteria may be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired, all designated uses are maintained and acutely toxic conditions are prevented.

The Washington Water Quality Standards at WAC 173-201A-400 provides Washington’s mixing zone policy for point source discharges. These permits do not authorize a mixing zone.

pH

The effluent limitation for Hydrogen Ion (pH) proposed in the draft permits for cooling water, sumps, drainage, and dewatering discharges are established to meet the State of Washington and The water quality criterion for pH is found in WAC 173-201A-200 1(g) and states that for salmonid spawning, rearing and migration, pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

Effluent pH data were compared to the water quality criteria. There were no pH values outside the 6.5 to 8.5 range at Ice Harbor Lock and Dam, Little Goose Lock and Dam, and Lower Granite Lock and Dam. There were three instances that Lower Monumental Lock and Dam had values between 8.0 to 9.0.

The Lower Monumental Lock and Dam had pH values from 8.0 to 9.0 in Outfalls 004, 007, and 008. These outfalls are associated with emergency diesel generator cooling water and cooling water in the main units. It is not clear why there would be higher pH levels, since the cooling water is only exposed to heat, and oil and grease when a pipe is broken.

The permits propose pH limits not less than 6.5 and not more than 8.5 standard units to ensure that surface waters do not exceed this range from discharges from the hydroelectric generating facilities. This limit meets Washington water quality criteria.

Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD)

BOD and COD are measures of the amount of degradable material that may deplete oxygen. The Washington water quality standard for dissolved oxygen for salmon spawning, rearing and migration is 8.0 mg/L (WAC 173-201A-200 1(d)). There are no water quality standards in Washington for BOD or COD. Oil and grease are oxygen-demanding substances. Sumps may also concentrate oxygen-demanding substances that may be present in pass through water. Therefore, BOD and COD could be present in sump discharges, and to a lesser degree, dewatering and cooling water discharges. BOD and COD is also present in influent water, so may be part of the pass through and leakage water. The permit does not address the pass through water, as previously explained.

BOD and COD concentrations at the four facilities were relatively low, with some exceptions. The EPA has determined there is no reasonable potential for oxygen-demanding substances in the hydroelectric generating facilities' discharges to impact dissolved oxygen in the Lower Snake River. Operations from the hydroelectric facilities are not expected to add significant amounts of oxygen-demanding substances that would require permit effluent limitations. The Lower Snake River receiving water has significantly higher flows compared to discharges from outfalls. In addition, the facilities generate oxygen over their spillways and tailrace, which then combines with discharge waters. Oxygen-demanding substances from the operations may arise from oil and grease, for which the permit has effluent limitations, monitoring, tracking, and minimization requirements. The permit also requires total suspended solids or detritus, to be minimized. As a result, the EPA has determined there is no reasonable potential and is not proposing limits or monitoring for oxygen-demanding substances, except for the navigation locks fill valve and drainage sumps at Little Goose Lock and Dam. Since sumps may accumulate organic material and because of relatively high COD concentrations, the permit is requiring quarterly COD monitoring in influent and effluent at Outfalls 013 and 015 at Little Goose Lock and Dam.

Table 15. BOD and COD Detections at Ice Harbor Lock and Dam, Lower Monumental Lock and Dam, Little Goose Lock and Dam, and Lower Granite Lock and Dam

Facility	Outfall	Outfall Description	BOD (mg/L)	COD (mg/L)
Ice Harbor Lock and Dam	002	Navigation lock pump 4	9.8	4.4
	015	HVAC discharge	6.3	19
Lower Monumental Lock and Dam	003	Heat pump cooling water	2.8	28
	001	Drainage sump	--	8.4
Little Goose Lock and Dam	005	Main Unit 1 cooling water	11	25
	006	Main Unit 2 cooling water	3.7	11
	013	Navigation lock fill valve sump	18	112
	015	Navigation lock drainage sump	16	34
Lower Granite Lock and Dam	004	Main Unit 2 cooling water	9.8	20

	005	Main Unit 3 cooling water	5.8	14
	009	Heat pump	5.4	13
	010	Central Non-overflow sump	5.7	19

Oil and Grease

The oil and grease limits are derived from the narrative water quality criteria in the state water quality standards, which states that "toxic, radioactive or deleterious material concentrations must be below those which have the potential either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent on the waters, or adversely affect public health (WAC 173-201A-260-2(a));" and "Aesthetic values must not be impaired by the presence of materials of their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste (WAC 173-201A-260-2(b).

The EPA interprets these narrative criteria as prohibiting a discharge to these waters that would cause an oil sheen. Although effluent concentrations are low for oil and grease, these are the primary pollutants introduced by facility operations and could be present in discharges from sumps, dewatering, and cooling water. The EPA has established daily maximum oil and grease limitations of 5 mg/L to represent the concentration at which there is an oil sheen on surface waters. This limit is consistent with several NPDES permits issued in Washington at shipyards[1] where a 5 mg/L was established to control for no visible oil sheen. This concentration was based on best professional judgment and on the detection limit for oil and grease, which is 5 mg/L. A daily maximum effluent limit of 5 mg/L will ensure the narrative water quality standards for deleterious, aesthetic, and no visible oil sheen are met. The EPA believes that this limit is a reasonable standard for facilities that have a reasonable potential for oil and grease discharges.

In addition, the permit requires the permittee to develop and implement a BMP Plan and BMP Annual Reports, which includes tracking and accountability of oil use in the facility, minimization of any oil spills, proper operation and maintenance of all equipment that may release oil, and identification of and contingency planning for site-specific vulnerabilities for oil spills such as lack of secondary containment. For lubricants such as oil and grease, the permit requires the use of EALs to replace oil and grease, unless technically infeasible, to reduce the potential of oil and grease entering the river and an EAL Annual Report tracking implementation progress.

Toxics

Washington has narrative criteria in their water quality standards at WAC 173-201A-240 that prohibit toxic discharges in concentrations that impair designated beneficial uses. Noncontact cooling water discharges do not contain or come into contact with raw materials, intermediate products, finished products, or process wastes. There is no information on whether discharges from the hydroelectric projects contain toxic or hazardous pollutants other than oil and grease.

To ensure that discharges do not occur, the permits establish narrative effluent limitations for toxic pollutants in Part I.B.2. The permits do not allow for the addition of toxic materials or chemicals and prohibit the discharge of PCBs. They also require the use of paints, caulk, and lubricants free of PCBs, unless technically infeasible. Further, additives used to control biological growth in such

[1] Barnacle Point Shipyards WA-003099-6, Dakota Creek Industries WA-003141-1, Vigor Shipyards, Incorporated WA-000261-5, Everett Shipyard, Piers 1, 3 and Adjacent Areas WA-003200-0.

cooling systems are prohibited due to their inherent toxicity to aquatic life. The permit requires a PCB Management Plan and PCB Annual Reports to prevent, track and address PCB discharges.

Total Suspended Solids (TSS)

The Washington water quality standards have narrative criteria that apply to TSS: "Toxic, radioactive, or deleterious material concentrations must be below those which have potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those water, or adversely affect public health (WAC 173-201A-260)."

Suspended solids in water can cause turbidity and interfere with salmonid migration and growth. In the hydroelectric generating facilities, water originates from the upstream river which may contain solids that pass through the operation. TSS is most likely present in sumps and floor drains, where they may accumulate. Cooling water intake lines have strainers which help to remove most sediment.

TSS levels at Ice Harbor Lock and Dam ranged from 2.6 – 15 mg/L; 2.8 – 6.2 mg/L at Lower Monumental Lock and Dam, except for one value of 74 mg/L; 1 – 19 mg/L at Little Goose Lock and Dam, except for one value of 37 mg/L; and 1 - 7 mg/L at the Lower Granite Lock and Dam.
The BMP Plan requires facilities to clean intake screens and racks to reduce sediment that may enter the project. The EPA has determined that TSS limits and monitoring are not needed for TSS because concentrations of TSS are relatively low. The exceptions are Outfall 003 at Lower Monumental Lock and Dam and Outfall 013 at Little Goose Lock and Dam, which has relatively higher TSS levels. It is unclear what the sources of TSS are at these outfalls. The permit requires quarterly monitoring of TSS in influent and effluent to evaluate whether TSS is a persistent problem. This information will be used to inform the next permit cycle.

Temperature

The Washington water quality standards for temperature for salmonid spawning, rearing, and migration is 20.0^{o}C in the Lower Snake River. See WAC 183-201A-602. Cooling water receives heat from equipment that is being cooled, and through this exchange, heat is added to cooling water from hydroelectric generating facilities. Heat from cooling water may also be present in drainage sumps that receive cooling water, though temperature effects are likely to be minimal given the amount of cooling water compared to drainage water.

Influent temperatures for the Lower Snake River hydroelectric generating facilities ranged from 18^{o}C to 25^{o}C.

As previously explained, the Lower Snake River is impaired for temperature. Effluent temperature data are limited, but based on these data and analysis shown in Table 10, discharges from the facilities have minimal impact on Lower Snake River temperatures However, because temperature is important to threatened and endangered salmon in the Lower Snake River, the EPA is proposing year-round monitoring for temperature including:

- continuous monitoring for any discharges with cooling water and monthly monitoring where a similar discharge already has continuous monitoring.
- continuous influent monitoring on cooling water for main units and large transformer units with continuous effluent monitoring.

The hydroelectric generating facilities are also required to submit a Temperature Data Report with the next permit application that includes temperature data from each outfall expressed as 7DADM, monthly average, and daily maximum. These temperature monitoring requirements will apply at all of the facilities. The EPA believes this additional information is necessary to inform the next permit renewal cycle to better assess the impacts from the permitted discharges on temperature in the Snake River.

Table 16. Proposed Water Quality Based Effluent Limitations

Parameter	Units	Effluent Limits	Designated Use in Washington WQS Linked to Specific Water Quality Criteria Used as Basis for Limits
pH	standard units	Not less than 6.5 or greater than 8.5 standard units (s.u.)	Aquatic Life
Oil and Grease	mg/L	5 (daily maximum)	Aquatic Life

E. Minimum Levels

All water samples must be analyzed using EPA approved analytical methods and must be analyzed using a sufficiently sensitive method that will detect the concentration of the parameter if it is present.

Table 17. Minimum Levels Applicable in the Lower Snake River Hydroelectric Projects

Parameter	ML/Interim ML
pH	N/A
Temperature	0.2°C
Oil and Grease	5 mg/L
TSS	5 mg/L
COD	10 mg/L

F. Anti-degradation and Clean Water Act Section 401 Certification

The WQS contain an anti-degradation policy providing three levels of protection to water bodies in Washington (WAC 173-201A-300).

Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing and designated uses of a water body must be maintained and protected (WAC 173-201A-310).

Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (WAC 173-201A-320).

Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters (ORWs) and requires that activities not cause a lowering of water quality (WAC 173-201A-330).

The EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES permits that ensure compliance with state and tribal water quality standards. A facility must meet Tier I requirements to ensure that all existing and designated uses are maintained and protected. No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in Chapter 173-201A WAC.

The effluent limits in the proposed draft permit contain limits for oil and grease and pH. The draft permit also prohibits discharges of toxic substances, including PCBs, in toxic amounts that may cause or contribute to an impairment of designated uses in violation of the State of Washington water quality standards. The draft permit requires additional monitoring for flow and temperature in the effluent.

The effluent limitations and monitoring requirements contained in the draft permit ensure compliance with the narrative and numeric criteria in the water quality standards. Therefore, it was determined that the permit will protect and maintain existing and designated beneficial uses in compliance with the Tier I provisions for all pollutants.

G. Anti-backsliding

Section 402(o)(2) of the Clean Water Act and federal regulations at 40 CFR 122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. These are new permits, and therefore, backsliding is not an issue.

IV. Monitoring and Reporting Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to the EPA. The permittee must analyze water samples using sufficiently sensitive EPA-approved analytical methods.

B. Monitoring Locations

Discharges authorized by this permit must be monitored at each outfall identified in the permit. All facilities are required to monitor for applicable parameters and pollutants at the last point in the treatment train before the treated effluent leaves the facility for compliance with the permit limitations described in Section IV of this fact sheet.

C. Monitoring Frequencies

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The permittee has the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

The measurement frequency is established for flow, oil and grease, and pH at once per week in the first year for discharges of equipment and floor drain water, and discharges that are a combination of equipment and floor drain water, maintenance-related water, equipment-related backwash strainer water, and maintenance-related water during flood/high water events. If there are no detections in an outfall in the first year, the monitoring frequency is reduced to once per month. This frequency for these discharges is to provide representative data on the monthly variability of each parameter.

The monitoring frequency for temperature for cooling water influent and effluent is every half hour using a continuous monitoring probe or once per month for discharges that are similar to other discharges with continuous monitoring. For example, a subset of cooling water discharges from main units require continuous temperature monitoring, while the remaining discharges require a monthly grab sample for temperature. The EPA has determined this to be an appropriate way for representative samples for temperature to be collected where the influent and operations are the same. Where wastestreams are different, the permits require continuous temperature monitoring. Continuous monitoring captures variability of water temperature.

The monitoring frequency for COD and TSS are once per quarter for outfalls that have high concentrations. The operations at the hydroelectric generating facilities are not expected to increase COD and TSS. However, because COD and TSS were detected, the permit requires quarterly monitoring to capture seasonal variability of these parameters.

D. Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application.

The EPA currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: https://netdmr.epa.gov. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

V. Special Conditions

A. Quality Assurance Plan (QAP)

40 CFR 122.41(e) requires the permittee to develop a QAP to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The draft permits propose that hydroelectric generating facilities complete and implement a QAP within 180 days of their authorization to discharge from the EPA.

The permittee is required to follow specific sampling procedures [i.e., the EPA approved quality assurance, quality control, and chain-of-custody procedures described in Requirements for Quality Assurance Project Plans (EPA/QA/R-5)]; and Guidance for Quality Assurance Project Plans (EPA/QA/G-5) throughout all sample collection and analysis activities in order to ensure that quality data are collected.

The QAP must consist of standard operating procedures that the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. It must be available on-site for inspection at the request of the EPA.

40 CFR §122.41(e) requires the permittee to properly operate and maintain their facilities, including “adequate laboratory controls and appropriate quality assurance procedures.” In order to implement this requirement, the draft permits require that the permittee develop or update a QAP that ensures that the monitoring data submitted to the EPA is complete, accurate, and representative of the environmental or effluent conditions.

B. Best Management Practices (BMP) Plan and BMP Annual Reports

Pursuant to Section 402(a)(1) of the Clean Water Act, development and implementation of a BMP Plan may be included as a condition in NPDES permits. Section 402(a)(1) authorizes the EPA to include miscellaneous requirements in permits on a case-by-case basis, which are deemed necessary to carry out the provisions of the Act. BMPs, in addition to effluent limitations, are required to control or abate the discharge of pollutants in accordance with 40 CFR 122.44(k). The BMP Plan requirement has also been incorporated into the permits in accordance with EPA BMP guidance (EPA, 1993).

The permits require the development and implementation of a site-specific BMP Plan, which prevents or minimizes the generation and potential release of pollutants from the facility to the waters of the United States through BMPs. This includes, but is not limited to, oil accountability tracking; site-specific measures to prevent the escape of grease and heavy oils used for lubrication and hydraulics; identification of site-specific vulnerabilities, ways to address these vulnerabilities, and contingency planning for potential oil releases from these vulnerabilities; and measures to reduce the need for lubricants for all facility equipment that come in contact with river water.

The BMP Plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of discharges associated with day-to-day work activity at the facility from equipment and floor drain-related water, maintenance-related water (collectively referred to as the "internal facility drainage water"), and any other facility-related water. The BMP Plan shall describe and ensure the implementation of practices which are to be used to eliminate or reduce the pollutants in internal facility drainage water discharges and facility-related water associated with operations at the facility and to assure compliance with the terms and conditions of this permit. The BMP Plan should incorporate elements of pollution prevention as set forth in the Pollution Prevention Act of 1990 (42 U.S.C. § 13101).

The permittee must develop a BMP Plan within 180 days of the effective date of the permits and certify to the EPA and Ecology in writing, the development and implementation of the BMP Plan. The certification must be signed in accordance with the Signatory Requirements in the permits. The permit also requires a BMP Annual Report. The purpose of the report is to evaluate the effectiveness of the implementation of BMPs, identify which BMPs have been effective, evaluate BMPs which have been ineffective, and use the information to inform adaptive management of the BMPs. The BMP Annual Report should also describe any changes in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants. The BMP Annual Report must be submitted to the EPA and Ecology each year by December 31. The BMP Plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants. The BMP Annual Report may serve as an addendum to update the BMP Plan.

C. EAL Plan and EAL Annual Reports

Pursuant to Section 402(a)(1) of the Clean Water Act, development and implementation of an EAL Annual Report may be included as a condition in NPDES permits. Section 402(a)(1) authorizes the EPA to include miscellaneous requirements in permits on a case-by-case basis, which are deemed necessary to carry out the provisions of the Act. EALs, in addition to effluent limitations, are required to control or abate the discharge of pollutants in accordance with 40 CFR 122.44(k).

The permits require the use of EALs for all equipment with oil to water grease interfaces, unless technically infeasible. EPA's 2011 Environmentally Acceptable Lubricants report defines EALs as "lubricants that have been demonstrated to meet standards for biodegradability, toxicity, and bioaccumulation potential that minimize their likely adverse consequences in the aquatic environment, compared to conventional lubricants." The permits require that EALs used in hydroelectric generating facilities are consistent with the definition of EALs in EPA's 2011 Environmentally Acceptable Lubricants report. The permits define technically infeasible for EALs as follows: no EAL products are approved for use in a given application that meet manufacturer specifications for that equipment; products which come pre-lubricated (e.g., wire ropes) and have no available alternatives manufactured with EALs; or products meeting a manufacturer's specifications are not available.

The permittee must also develop an EAL Annual Report, which will require an evaluation of equipment that are candidates for EAL use, whether EALs are technically feasible, and a timeline for which EALs will be implemented. It also requires the report to be updated annually. . The USACE has completed a series of reports on the feasibility of EALs and prioritization of EALs. Several of these reports may fulfill a part of the permit requirements. Any of these reports may be used and if needed, supplemented, to fulfill the permit requirements.

Wicket gates, in-line equipment, lubricated wire ropes, and Kaplan runners all use lubricants which may come into contact with water. This may result in release of lubricants into water. Currently, oil and grease are the primary lubricants used for equipment. However, EALs are an alternative lubricant that are biodegradable and less harmful to aquatic life species. EALs also offer a reasonable alternative to longer-term, but costly solutions such as oil-less turbines. EALs prevent or minimize the generation and potential release of pollutants from the facility to the waters of the United States.

The USACE has completed several reports evaluating EALs, comparing cost and feasibility with oil and grease lubricants, or mineral oils. An August 2015 study conducted by the USACE by Medina found that while EALs may be more costly in the short-term compared to mineral oils, EALs may last longer and need to be applied less. In addition, some EALs may be more effective than conventional mineral oil-based lubricants. Therefore, EALs in the long-term may be more cost effective. However, there are still some cases where EALs or other equivalent alternatives may be technically infeasible or are unknown. The information from the EAL Annual Report will help to inform the next permit cycle on the feasibility of using EALs to address potential releases from oil and grease lubricants.

D. PCB Management Plan and PCB Annual Reports

Section 402(a)(2) of the Clean Water Act allows the EPA to include requirements in permits on a case-by-case basis, which are deemed necessary to carry out the cited provisions of the CWA. 40 CFR §122.44(k) authorizes the permitting authority to include requirements to implement BMPs in NPDES permits to control or abate the discharge of pollutants whenever necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. BMPs are important tools for waste minimization and pollution prevention.

There are a range of potential sources of PCBs at dams, including transformers, transformer oil, other equipment oil, bushings, paints and caulks. In accordance with 40 CFR §122.44(k) the permits require BMPs to control or abate the discharge of PCBs from the facilities through the development and implementation of a PCB Management Plan (PMP).

The permittee must develop a PMP during the first year of the five-year permit cycle. The purpose of the PMP is to:

- Identify potential sources of PCBs and potential pathways for PCB discharges.
- Document actions that have been and will be established to limit the likelihood of PCB discharges through removal, containment or other mechanisms.
- Identify outfalls associated with potential PCB discharges.

The USACE has completed a series of internal reports on PCBs and has internal systems for tracking the disposal of equipment with PCBs. Several of these reports may fulfill a part of the permit requirements. Information from any of these reports may be used and if needed, supplemented, to fulfill the permit requirements.

Following the development of the PMP, the permittee must conduct two consecutive years of quarterly characterization monitoring for outfalls associated with potential PCB discharges. The permits require monitoring once in the winter and once in the summer during the two consecutive years of the permit cycle. Monitoring in the winter and in the summer is required because the weathering of PCBs can be a function of river temperature, so monitoring results from both of these temperature conditions provide a more comprehensive characterization of annual PCB discharges. Monitoring during warm and cool river conditions during two consecutive years should be sufficient to capture any PCB discharges.

The permit requires characterization monitoring using EPA Method 608.3 (https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100LVIY.txt) on the effluent for outfalls identified in the PMP as having potential PCB discharges. EPA Method 608.3 is appropriate for sampling dam discharge water because it is an EPA-approved method for PCBs and analyzes for PCB Aroclors. The range of potential sources of PCBs at dams are likely to exhibit Aroclor patters if present in discharge water, in contrast to PCB congeners which may indicate background PCBs present in the Snake River or sources of inadvertently produced PCBs within the dam. Since the PCB requirements in this permit are focused on sources of PCBs from the dams, sampling methods for Aroclors are more appropriate. The reporting limit for this method and matrix is expected to be 0.1 µg/L, which is sufficient to capture PCB discharges associated with PCB sources in the dam.

The permits require a PCB Annual Report following the development of the PMP (years 2-5 of the permit cycle). For the two-year sampling window only, the annual report will include the results of the characterization monitoring conducted during these two years of the permit cycle, including sampling date, analysis method, analysis date and lab. In addition, the PCB Annual Report must report the progress on source identification investigations, BMP implementation, and current and future actions to adapt and refine BMP approaches during the five-year permit cycle.

E. Cooling Water Intake Structure (CWIS) Plan and CWIS Annual Reports

Section 316(b) of the CWA requires that facilities with CWIS ensure that the location, design, construction, and capacity of the structure reflect the best technology available (BTA) to minimize adverse impacts on the environment from impingement and entrainment of fish and other aquatic organisms.

The 2014 Section 316(b) regulation for cooling water intake structures at existing facilities establishes, among other things, substantive requirements for cooling water intake structures meeting certain thresholds.[1] While the great majority of cooling water intake structures at hydroelectric facilities do not meet these thresholds, all of the facilities discussed in this fact sheet meet the threshold. The Agency has determined that, in light of the text, structure, history and purpose of the regulation, in the case of hydroelectric facilities, the rule is ambiguous as to application of the substantive requirements and that the EPA never intended that the rule's substantive provisions would apply to them. Rather, pursuant to 40 C.F.R. § 125.90(b), all cooling water intake structures at hydroelectric facilities are subject to best professional judgment (BPJ) Section 316(b) cooling water

[1] The final section 316(b) existing facilities rule states that the substantive provisions of the rule apply to any facility that is 1) a point source 2) with a cooling water intake structure with a design intake flow greater than 2 MGD, 3) using 25 percent of the withdrawn water for cooling. 40 C.F.R. § 125.91(a).

intake structure conditions. This provision provides that a cooling water intake structure not subject to substantive provisions under the existing facility rule (40 C.F.R. § 125.94-99) or another 316(b) requirements rule must meet requirements established on a case-by-case, BPJ basis. Consequently, EPA is today proposing to establish case-by-case, BPJ 316(b) conditions for these hydroelectric facilities.

To determine if BTA requirements are satisfied, the EPA used the following framework to consider various technologies currently installed at hydroelectric generating facilities to establish case-by-case BPJ conditions.

<u>Hydroelectric Facility Technologies for Consideration by Permitting Authorities in Establishing Case-by-Case, BPJ 316(b) NPDES Permit Conditions</u>

The EPA generally expects that a hydroelectric facilities' existing controls are technologies that can be determined to satisfy the requirements of BTA to minimize entrainment and impingement mortality. The EPA is also aware that many hydroelectric facilities are required to implement measures that reduce the impacts of the dam, including the impacts to passage of aquatic life through the dam, as conditions of a FERC license or a Biological Opinion. While these are not technologies employed at the CWIS, these measures minimize the passage of aquatic life past the intake structures inside the penstocks of the dam and thus minimize the entrainment and impingement mortality.

The following four factors are considered "technologies" that could minimize adverse environmental impacts from the use of a CWIS at hydroelectric facilities. Specific facilities may have technologies other than those identified here that may also address adverse environmental impacts at the intake. The EPA may use any of the four factors below, or other facility-specific factors, in its BPJ analysis to determine whether BTA requirements have been satisfied. Any combination of one or more of the factors below may be used to address entrainment and impingement. In most cases, the EPA expects existing documentation may be used to evaluate these factors.

Factors applicable to all facilities:

1) Efficiency of power generation

   - Water use reduction is most commonly associated with closed cycle cooling tower use, but water use reduction through other means provides the same benefit. Looking holistically at power generation and the cooling water used per megawatt generated, hydroelectric facilities are more efficient than a once through steam electric facility as they generate less waste heat.

2) Cooling water withdrawn relative to waterbody volume or flow

   - In previous rulemakings, the EPA stated that using a low percentage of the waterbody flow or volume for cooling could be a factor that addresses impacts due to entrainment. In the New Facility Rule, the EPA established "proportional-flow requirements" that were intended to provide protections in addition to those commensurate with closed cycle and velocity requirements. For rivers and streams, the EPA found that,

     "The 5 percent value for rivers and streams reflects an estimate that this would entrain approximately 5 percent of the river or stream's entrainable organisms and a policy judgment that a greater degree of entrainment reflects an inappropriately located facility."

The cooling water withdrawn at each facility is a small fraction of the water passed through the dam for generating purposes, often less than 1%; EPA expects such withdrawals will be almost always below 5%.

- Proportional flow requirements only address entrainment as most passive floating organisms that are addressed by this factor are not of impingeable size. Impingement rates might be affected by a reduced flow, but in this case, there is no water use reduction, merely an overall minimal withdrawal of water relative to the waterbody flow or volume so credit for impingement reductions is not assumed.

Factors applicable to many facilities:

3) Location of the intake structure
    - The EPA identified that the location of the intake could be a factor that addresses impacts due to both impingement and entrainment. Location of the intake in areas with lower densities of impingeable or entrainable organisms will reduce the adverse impacts associated with the use of the CWIS.
    - For hydroelectric facilities, most of the intakes are located in the dam itself, either in the penstocks or the scroll case of the turbine. Generally, dams are designed such that the location of the penstock openings on the dam face are located at a depth with a lower density of organisms to reduce entrainment through the dam thus minimizing impacts from the operations of the turbine. As the CWIS is within the dam, there is a similar reduction in the density of organisms as compared to an intake on the face of the dam or in the waterbody itself.
    - Some dams do have intakes on the face of the dam or in the waterbody so this may not be applicable to all hydroelectric facilities. Even in these cases, the permitting authority may determine that no further controls are necessary.

4) Technologies at the facility
    - Design of the facility can be a factor that addresses impacts due to impingement. For example, many of the hydroelectric facilities have some form of screen over the intake pipe; generally this was intended for debris protection, but it also provides a level of impingement control compared to open pipe. The EPA considers organisms that would be retained on a certain mesh size to be "impinged" even if there is no comparable screen on the intake pipe and the organism may actually pass through the cooling system.
    - Most hydroelectric facility intakes upon a passive gravity feed which in some cases might lead to a lower intake velocity than a pumped system. Given that water is moving through the system to drive turbines, the velocity may be higher than would be experienced in normal flow velocity in a waterbody. However, this higher velocity results in a higher sweeping velocity past the opening of the intake thus minimizing the time in which an organism can be "impinged." Impinged organisms are often of a size that they have enough motility that when they sense a screen or the opening of the intake, they have an avoidance response and swim away. Combined with the sweeping velocity that carries the organism past the intake rapidly, this can minimize the actual impingement of organisms.

For the Lower Snake federal hydroelectric facilities, the EPA relied on factor 4, the technologies at the facility, in its BPJ evaluation for BTA. Existing technologies at these facilities include measures to deter fish from intakes, encourage fish to travel through fish passage structures or over spillways, and decrease velocities through turbines to minimize impingement and entrainment of aquatic life at cooling water intakes.

Table 18 summarizes the general technologies used at each facility to maximize fish survivability from hydroelectric operations, described in the 2018-2019 Fish Passage Plan and 2016 Biological Opinion Comprehensive Evaluation Report. It also summarizes dam passage survival rates for each project.

Table 18. Hydropower Operations at Ice Harbor Lock and Dam, Lower Monumental Lock and Dam, Little Goose Lock and Dam, and Lower Granite Lock and Dam for Fish Survival (2018-2019)

	BTA	**Average Fish Survival Rates**
Ice Harbor Lock and Dam	*Non-turbine routes*: spill to maximize fish passage for juvenile salmonids, fish passage structures, submersible traveling screens (STS) to deter fish from entering main unit turbines, vertical bar screens (VBS) at intakes *Turbine routes*: operate turbines at +/- 1% peak efficiency flows, operate turbines in priority order to maximize fish passage	
Lower Monumental Lock and Dam	*Non-turbine routes*: spill to maximize fish passage for juvenile salmonids, fish passage structures, STS to deter fish from entering main unit turbines, vertical bar VBS at intakes *Turbine routes*: operate turbines at +/- 1% peak efficiency flows, operate turbines in priority order to maximize fish passage	93-99% (2012-2013)
Little Goose Lock and Dam	*Non-turbine routes*: spill to maximize fish passage for juvenile salmonids, fish passage structures, VBS near intakes, extended length submersible bar screens (ESBS) to deflect fish to bypass structures *Turbine routes*: operate turbines at +/- 1% peak efficiency flows, operate turbines in priority order to maximize fish passage	91-99% (2012-2013)
Lower Granite Lock and Dam	*Non-turbine routes*: spill to maximize fish passage for juvenile salmonids, fish passage structures, ESBS, and VBS near intakes *Turbine routes*: operate turbines at +/- 1% peak efficiency flows, operate turbines in priority order to maximize fish passage	

As described above, the EPA generally expects that a hydroelectric facilities' existing controls are technologies that can be determined to satisfy the BTA requirement to minimize entrainment and impingement mortality. For the four Lower Snake hydroelectric facilities, these existing technologies include the requirements in Table 18.

The permits also require the permittee to submit a CWIS Annual Report by December 31 of each year documenting implementation, operations, and maintenance of BTA. The Report must include a certification statement that BTA has been properly operated and maintained and that no changes to the facility have been made unless documented. These permit conditions will help ensure that fish impingement mortality and entrainment at CWIS are minimized and that they are maintained and optimized throughout the permit cycle.

VI. Environmental Justice Considerations

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities." The EPA strives to enhance the ability of overburdened communities to participate fully and meaningfully in the permitting process for EPA-issued permits, including NPDES permit. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities. For more information, please visit http://ww.epa.gov/compliance/ej/plan-ej/.

As a part of the permit development process, the EPA Region 10 conducted screening analyses to determine whether the permit actions could affect overburdened communities. The EPA used a nationally consistent geospatial tool that contains demographic and environmental data for which enhanced outreach may be warranted. As part of the screening process, it was determined that Lower Monumental Lock and Dam is located within or near a Census block group that is potentially overburdened because of the location of the facility (87th percentile).

Regardless of whether a facility is located near a potentially overburdened community, the EPA encourages permittees to review (and to consider adopting, where appropriate) "Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways to Engage Neighboring Communities" (see https://www.federalregister.gov/articles/2013/05/09/2013-10945/epa-activities-to-promote-environmental-justice-in-the- permit-application-process#p-104. Examples of promising practices include thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, and other activities.

VII. Other Legal Requirements

A. State Certification

Section 401 of the CWA, 33 USC §1341, requires the EPA to seek a certification from the state that the conditions of the permits are stringent enough to comply with Washington water quality standards, including the state antidegradation policy, before issuing the final permit. Federal regulations at 40 CFR §124.53 allows for the state to stipulate more stringent conditions in the permit, if the certification cites the CWA or state law upon which that condition is based.

The regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of state law.

The EPA previously requested that Ecology review the draft permits and provide a preliminary certification pursuant to 40 CFR 124.53 in late October 2018 through January 2019. In February 2019, the EPA withdrew its request to Ecology for certification under Section 401. Therefore, EPA has reinitiated its request to Ecology for certification under Section 401 of the CWA on March 13, 2020.

B. Endangered Species Act [16 USC § 1531 et al.]

Section 7 of the Endangered Species Act (ESA) requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. The EPA is developing a Biological Evaluation (BE) to evaluate potential impacts to ESA species. Table 19 lists the threatened or endangered species in the Lower Columbia River and Lower Snake River. The EPA is in the process of working with the NOAA Fisheries and USFWS on ESA consultation. Any comments received from NOAA Fisheries and USFWS regarding ESA consultation will be considered prior to issuance of these permits.

Table 19. List of Threatened/Endangered Species in the Lower Columbia River and Lower Snake River

Species
Bull trout (Salvelinus confluentus)
Chinook salmon, Lower Columbia River
Chinook salmon, Snake River fall (Oncorhynchus tshawytscha)
Chinook salmon, Snake River spring/summer (Oncorhynchus tshawytscha)
Chinook salmon, Upper Columbia River spring
Steelhead, Snake River (Oncorhynchus mykiss)
Steelhead, Lower Columbia River
Steelhead, Middle Columbia River
Steelhead, Upper Columbia River
Sockeye salmon, Snake River (Oncorhynchus nerka)
Chum salmon, Columbia River
Coho salmon, Lower Columbia River
Pacific eulachon/smelt
Green sturgeon
Oregon spotted frog (rana pretiosa)

C. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. The EPA is in the process of working with the NOAA Fisheries on the EFH assessment.

The EPA has provided NOAA Fisheries with copies of the draft permit and fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to issuance of this permit.

D. National Environmental Policy Act (NEPA) [42 USC § 4321 et.seq.]

Regulations at 40 CFR 122.49, list the federal laws that may apply to the issuance of permits i.e., ESA, National Historic Preservation Act, the Coastal Zone Act Reauthorization Amendments

(CZARA), NEPA, and Executive Orders, among others. The NEPA compliance program requires analysis of information regarding potential impacts, development and analysis of options to avoid or minimize impacts; and development and analysis of measures to mitigate adverse impacts.

Since hydroelectric generating facilities are not new sources (i.e., they do not have any EPA-promulgated ELGs or new source performance standards (NSPS) specific to their operation), the EPA determined that no Environmental Assessments (EAs) or Environmental Impact Statements (EISs) are required under NEPA.

E. Historic Preservation Act

These permits will not authorize the construction of any water resources facility or the impoundment of any water body or have any effect on historical property.

F. Paperwork Reduction Act [44 USC § 3501 et seq.]

The information collection required by this permit has been approved by OMB under the provisions of the Paperwork Reduction Act, 44 U.S.C.3501 et seq., in submission made for the NPDES permit program and assigned OMB control numbers 2040-0086 (NPDES permit application) and 2040-0004 (discharge monitoring reports). Additionally, this proposed permit requires electronic reporting for discharge monitoring reports to reduce reporting time and paper mailing costs.

G. Standard Permit Provisions

Specific regulatory management requirements for NPDES permits are contained in 40 CFR 122.41. These conditions are included in the permits as standard regulatory language that must be included in all NPDES permits. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

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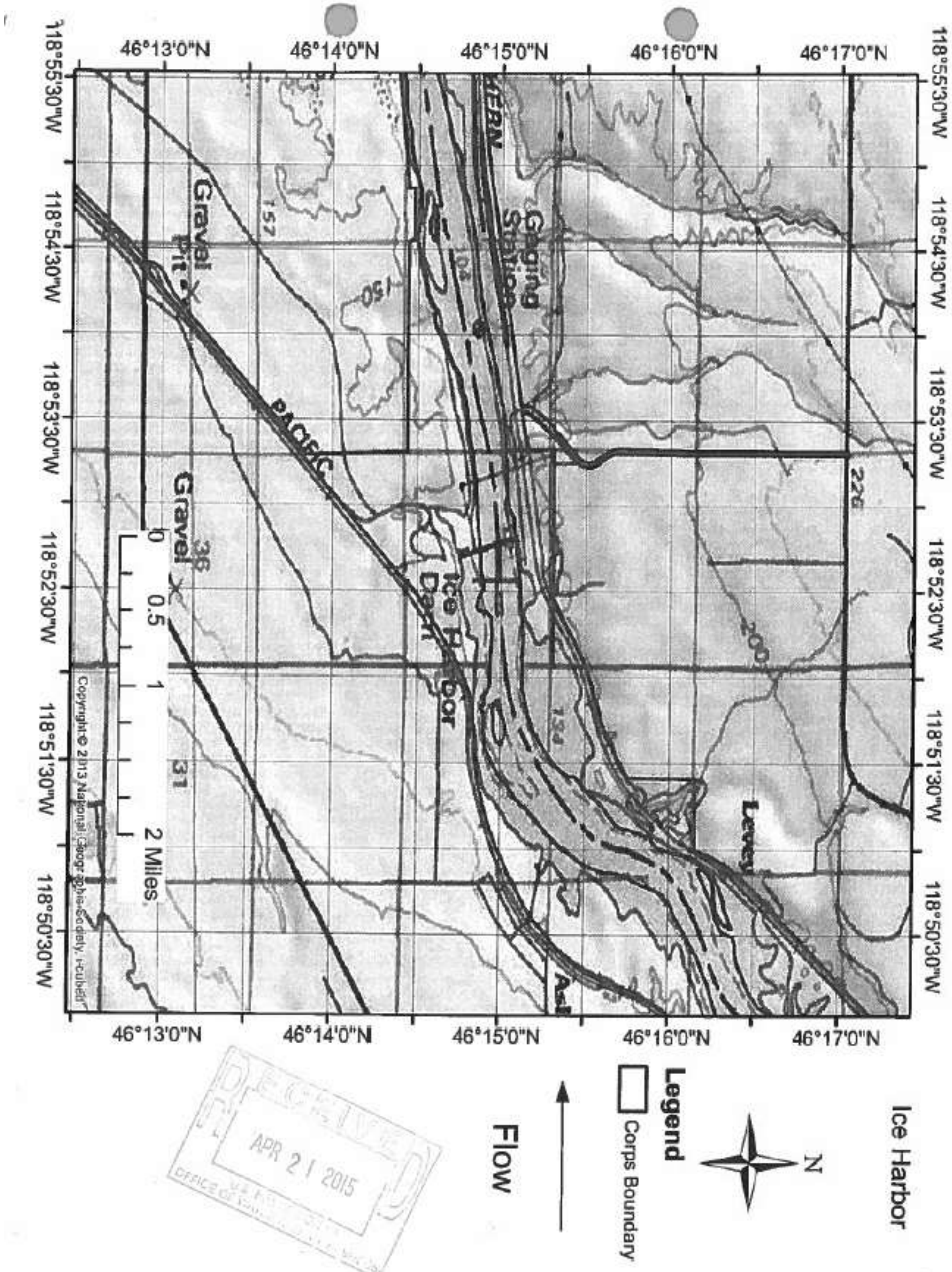
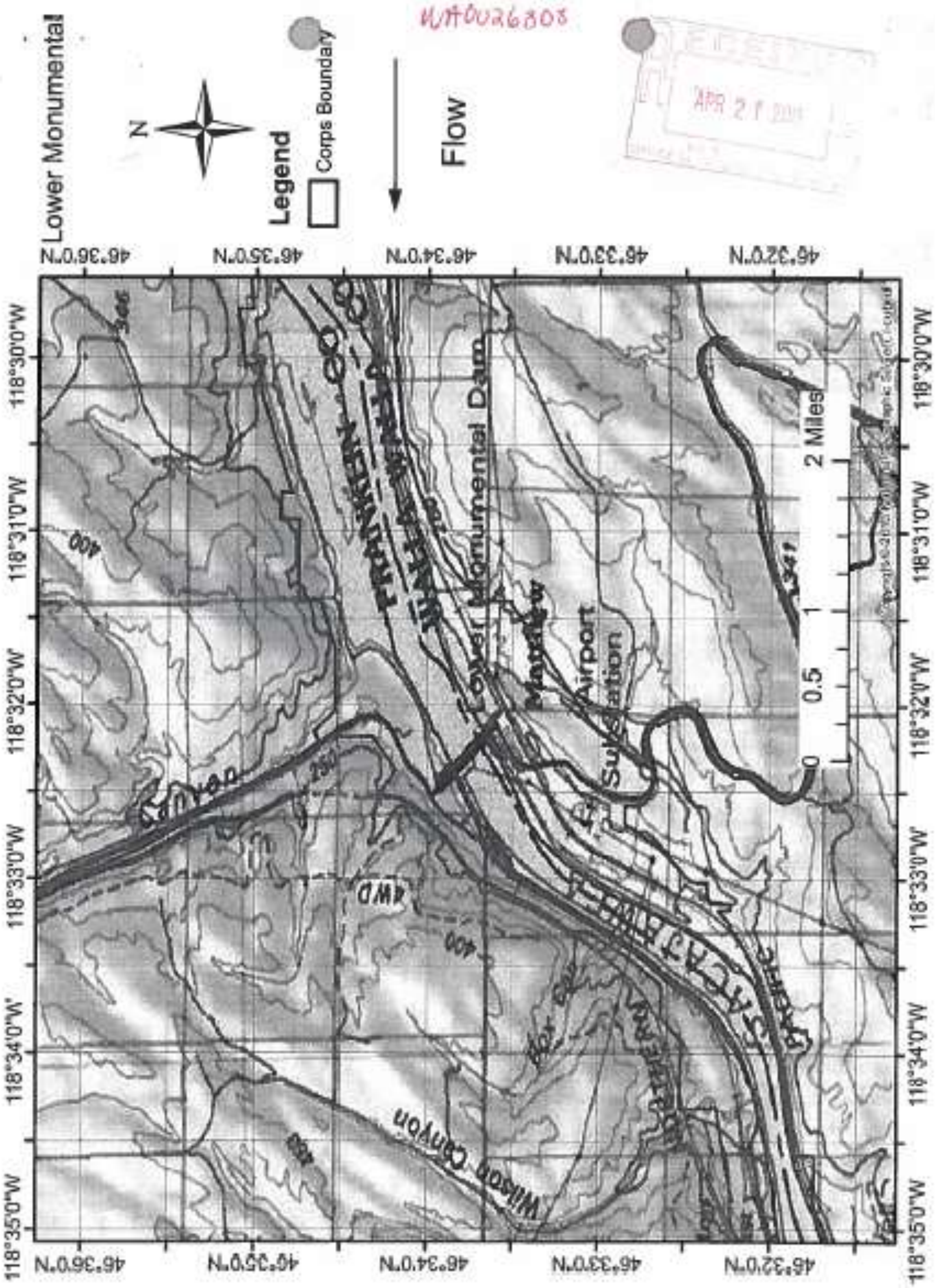
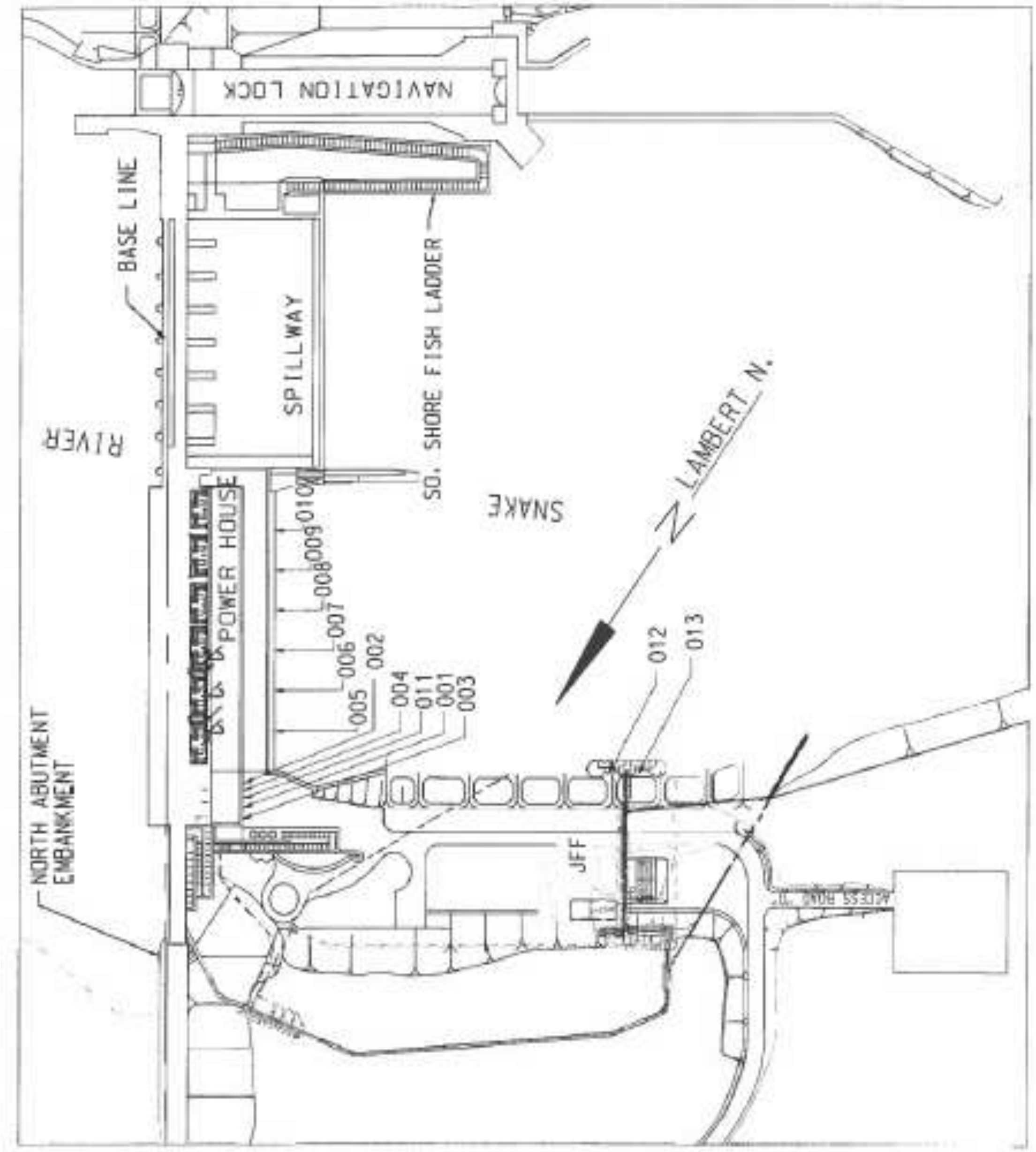
Appendix A

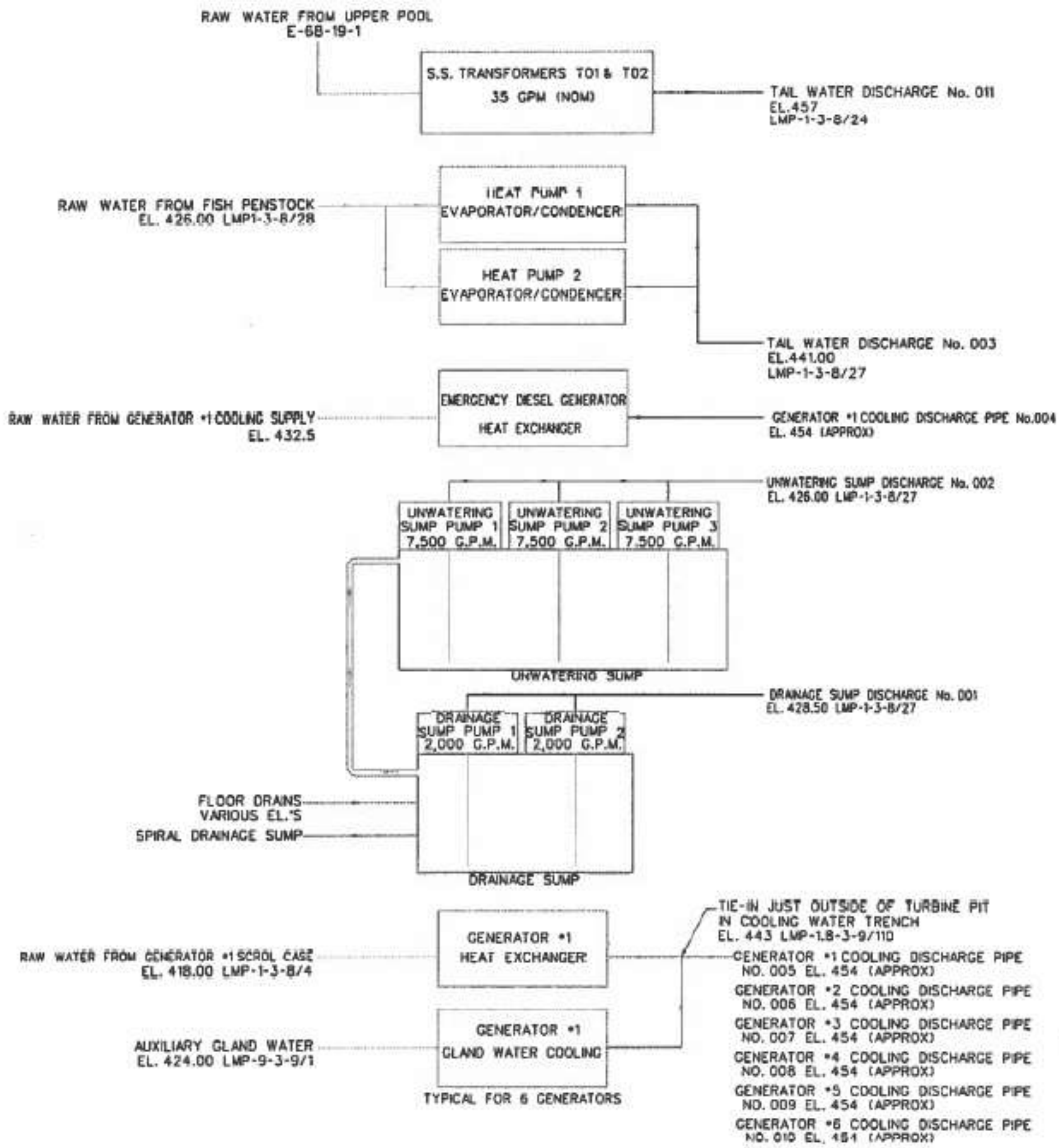
Ice Harbor Lock and Dam Location and Process Diagrams



Lower Monumental Lock and Dam Location and Process Diagram

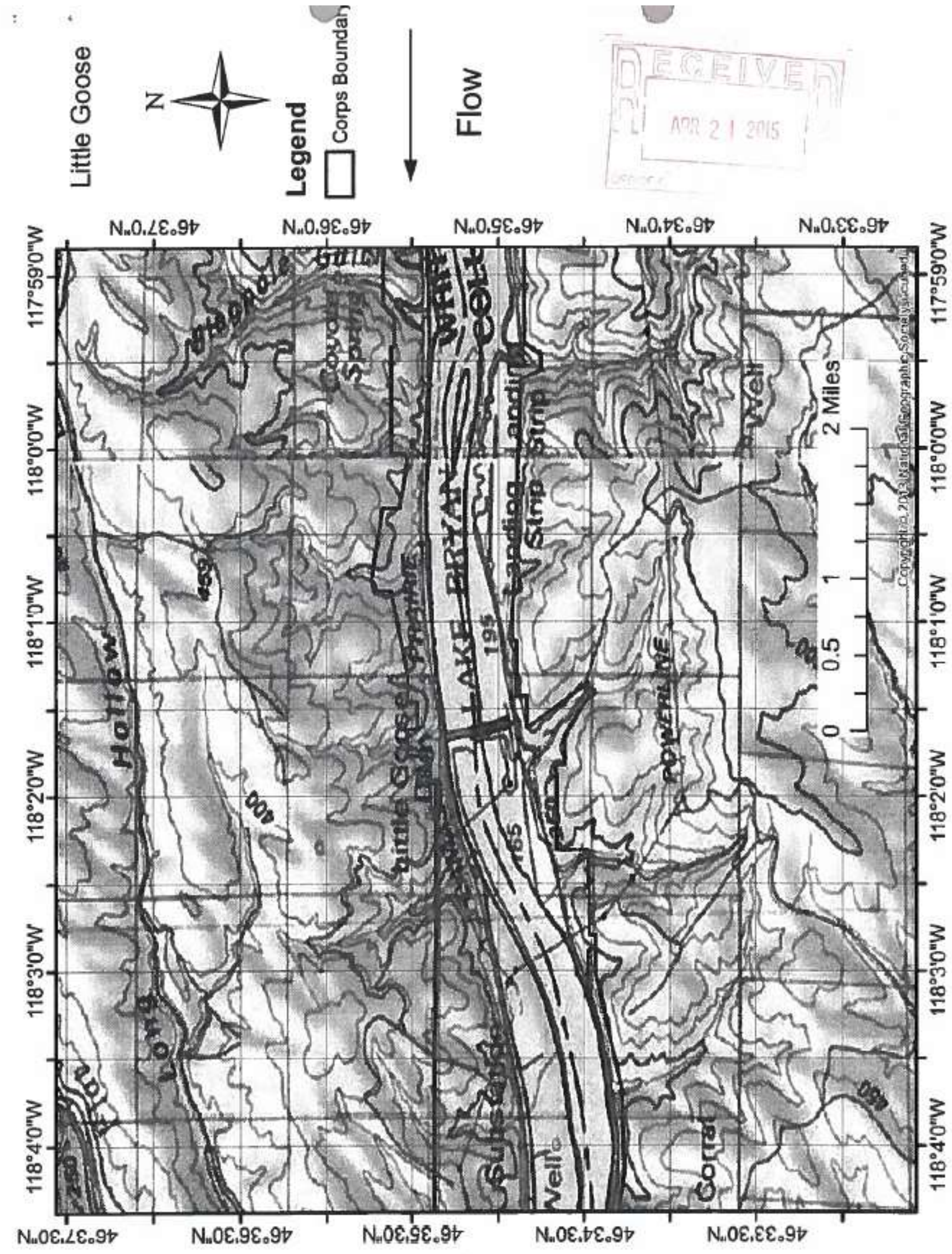


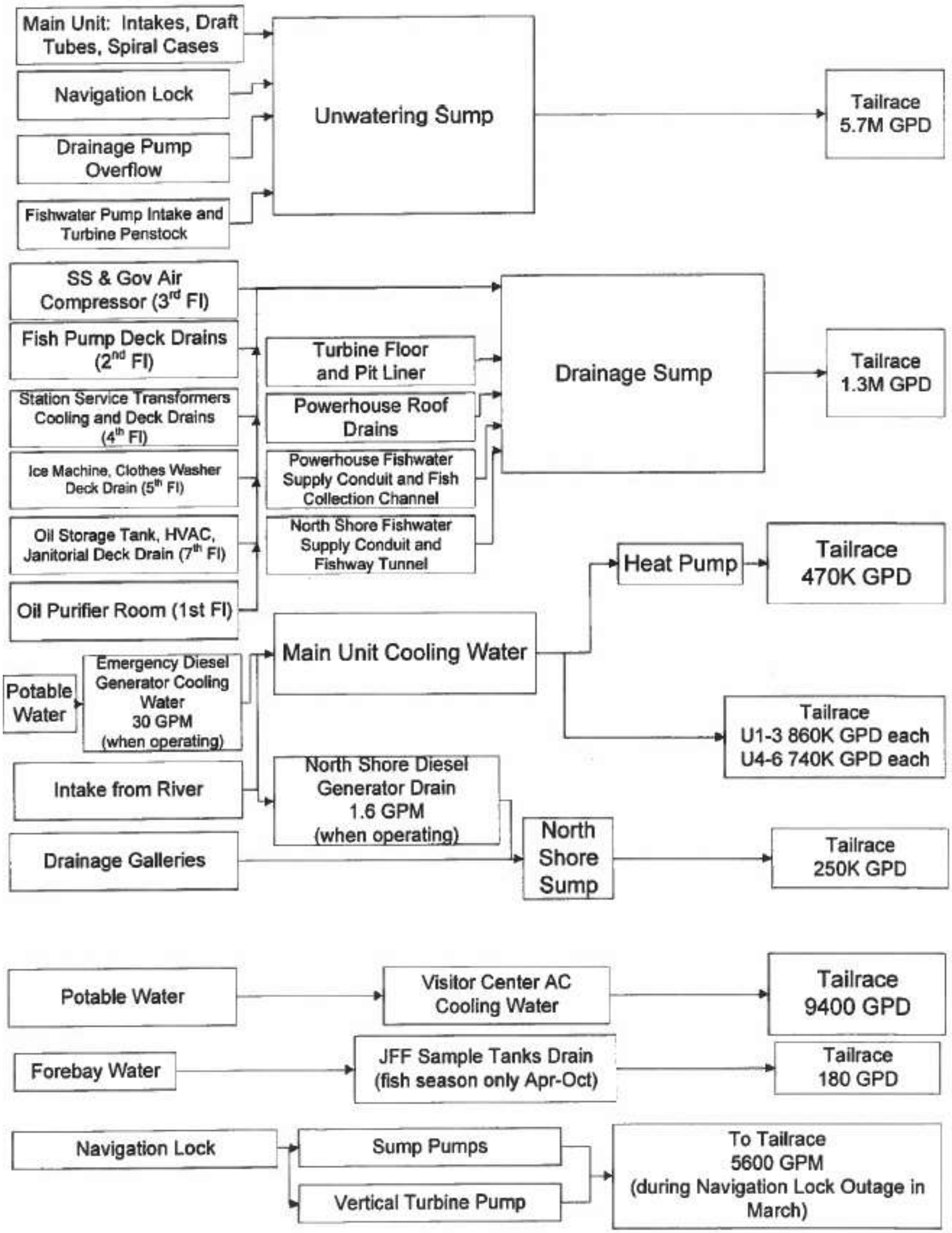

NAVIGATION LOCK
BASE LINE
SPILLWAY
SO. SHORE FISH LADDER
RIVER
SNAKE
LAMBERT N.
POWER HOUSE
010
009
008
007
006
005
002
004
011
001
003
012
013
NORTH ABUTMENT EMBANKMENT
JFF
ACCESS ROAD



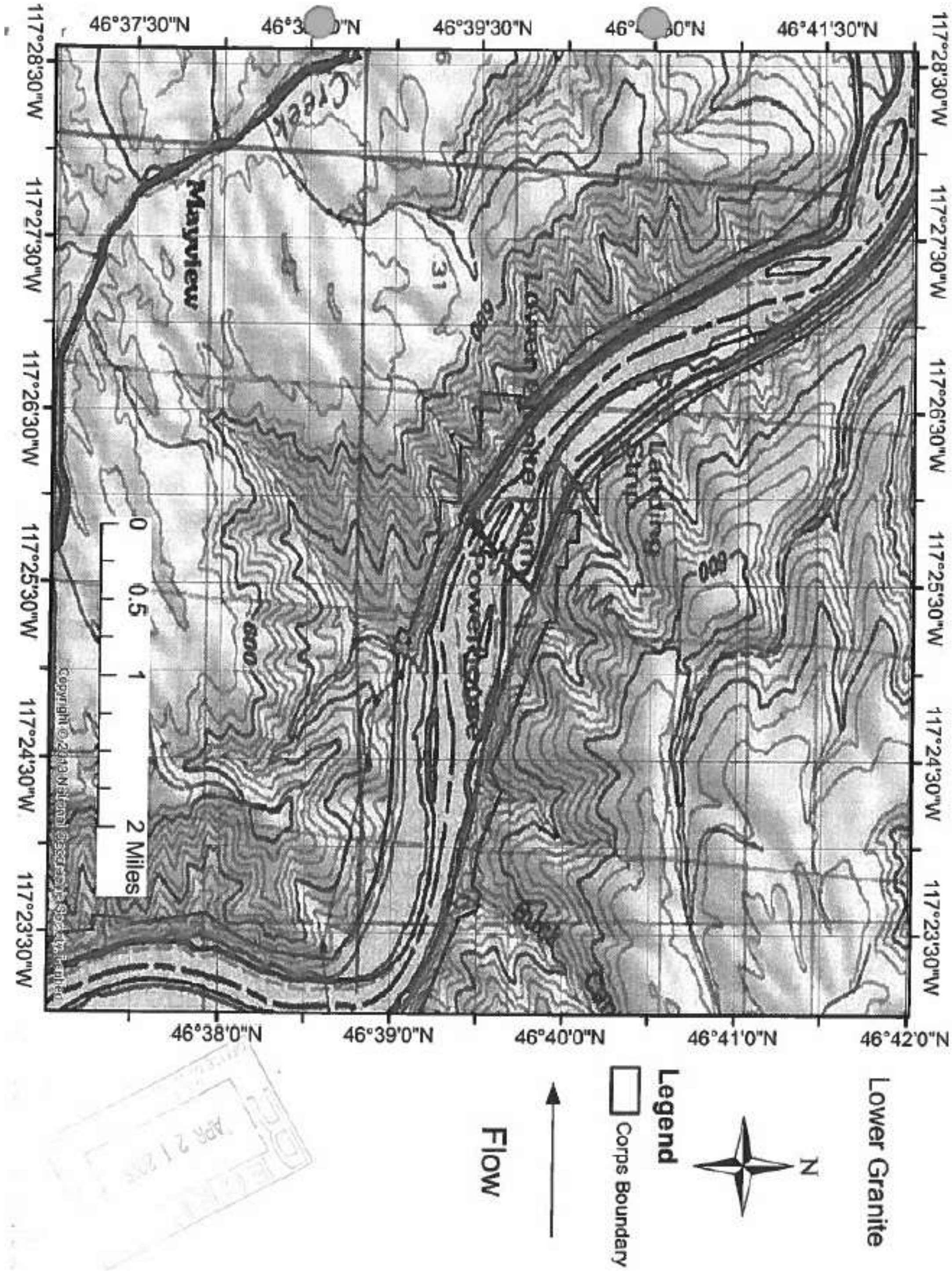
LOWER MONUMENTAL LOCK AND DAM
POWERHOUSE PROCESS WATER BLOCK DIAGRAM

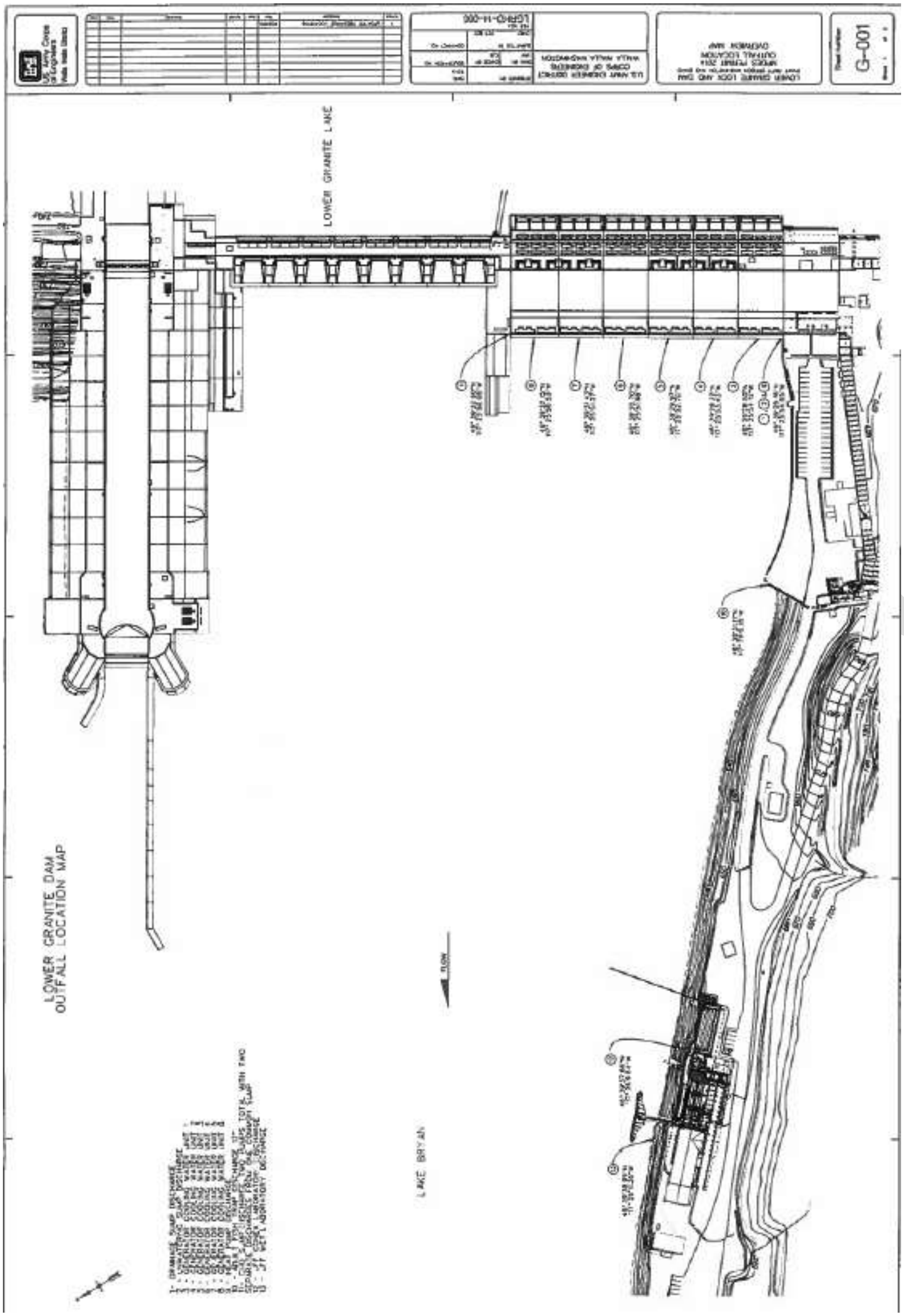
Little Goose Lock and Dam Location and Process Diagram

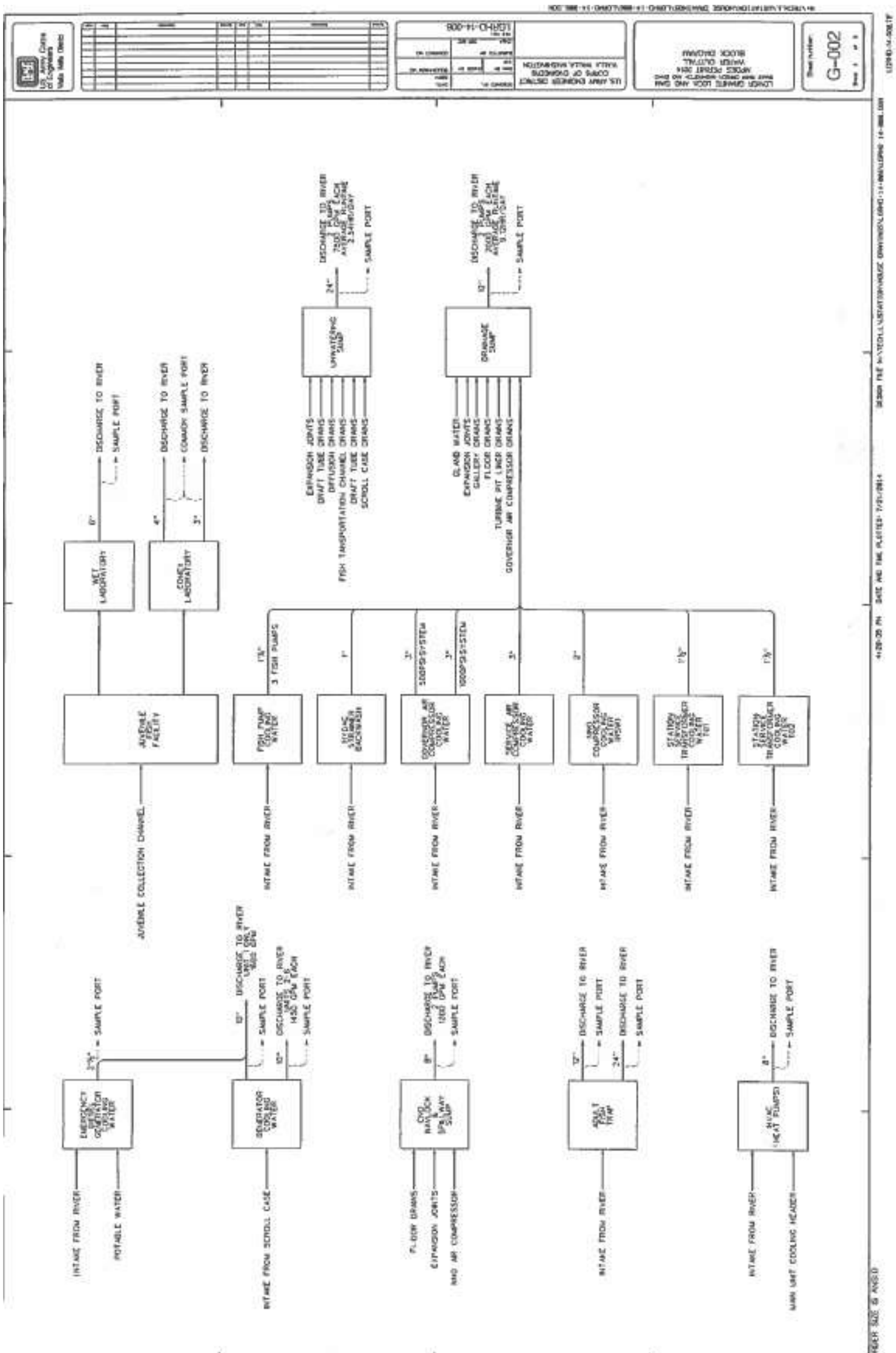



Main Unit: Intakes, Draft Tubes, Spiral Cases
Navigation Lock
Drainage Pump Overflow
Fishwater Pump Intake and Turbine Penstock
Unwatering Sump
Tailrace 5.7M GPD
SS & Gov Air Compressor (3rd Fl)
Fish Pump Deck Drains (2nd Fl)
Station Service Transformers Cooling and Deck Drains (4th Fl)
Ice Machine, Clothes Washer Deck Drain (5th Fl)
Oil Storage Tank, HVAC, Janitorial Deck Drain (7th Fl)
Oil Purifier Room (1st Fl)
Turbine Floor and Pit Liner
Powerhouse Roof Drains
Powerhouse Fishwater Supply Conduit and Fish Collection Channel
North Shore Fishwater Supply Conduit and Fishway Tunnel
Drainage Sump
Tailrace 1.3M GPD
Heat Pump
Tailrace 470K GPD
Potable Water
Emergency Diesel Generator Cooling Water 30 GPM (when operating)
Main Unit Cooling Water
Tailrace U1-3 860K GPD each U4-6 740K GPD each
Intake from River
North Shore Diesel Generator Drain 1.6 GPM (when operating)
Drainage Galleries
North Shore Sump
Tailrace 250K GPD
Potable Water
Visitor Center AC Cooling Water
Tailrace 9400 GPD
Forebay Water
JFF Sample Tanks Drain (fish season only Apr-Oct)
Tailrace 180 GPD
Navigation Lock
Sump Pumps
Vertical Turbine Pump
To Tailrace 5600 GPM (during Navigation Lock Outage in March)

Lower Granite Lock and Dam and Process Diagram




LOWER GRANITE DAM
OUTFALL LOCATION MAP
LOWER GRANITE LAKE
LAKE BRYAN
G-001



Appendix B

Summary of Water Quality Data

Influent Data from Permit Applications

DAM	Temp (C)	pH	BOD (mg/L)	TSS (mg/L)	COD (mg/L)	TOC (mg/L)	Ammonia (mg/L)	Oil/Grease (mg/L)	PCB (mg/L)
ICE HARBOR	22.1	8.36	<2.0	3.9	12.5	1.9	0.03	ND	ND
LOWER MONUMENTAL	18	8	<2.0	3.3	<5	1.73	0.045	ND	ND
LITTLE GOOSE	18.2	8.04	6.2	6	12.7	3.48	0.056	1.8	nd
LOWER GRANITE	24.9	8.42	<2.0	2	8.91	1.85	0.107	nd	nd

Changes in Temperature in Receiving Water after Full Dilution

Facility	Facility Total Maximum Daily Discharge (MGD)	Snake River Minimum Average Daily Flow (MGD) (2011-2016)	Facility Discharge/ Snake River Flow	Snake River Influent Temperature (°C)	Facility Flow-weighted average temperature (°C)	Temperature change with full dilution (°C)
Ice Harbor	39.8	5791.0	0.69%	22.1	21.4	-0.004812848
Lower Monumental	27.8	6844.5	0.41%	18	17.2	-0.003249326
Little Goose	40.1	6657.1	0.60%	18.2	19.4	0.007228411
Lower Granite	29.0	8214.7	0.35%	24.9	20.2	-0.016606328

Ice Harbor Lock and Dam Permit Application Data, Total Design Flow, and Flow-Weighted Average Temperature

Outfall Number	Outfall Description	Maximum Daily Value Flow Rate (MGD)	Max Daily BOD (lbs)	Max Daily BOD (mg/L)	Avg Daily BOD (lbs)	Avg Daily BOD (mg/L)	Max Daily TSS (lbs)	Max Daily TSS (mg/L)	Avg Daily TSS (lbs)	Avg Daily TSS (mg/L)	Fecal (lbs)	Fecal (mg/L)	Max Daily TRC (lbs)	Max Daily TRC (mg/L)	Avg Daily TRC (lbs)	Avg Daily TRC (mg/L)	Max Daily Oil and Grease (lbs)	Max Daily Oil and Grease (mg/L)	Avg Daily Oil and Grease (lbs)	Avg Daily Oil and Grease (mg/L)
1	Navigation lock spump 3: tainter valve #1 Drainage Sump discharge	2.2	0.0	<2	0.0	<2	103	5.7	4.9	5.7	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
2	Nav Lock Pump 4: North Fish Pumphouse Unwaterins sump discharge	2.2	177	9.8	8.5	9.8	153	8.5	7.4	8.5	NA	NA	1.0	0.1	0.1	0.1	0.1	0.1	79	4.4
3	Nav Lock Pump 8: North Non-Overflow Drainage Sump Discharge	0.7	0.0	<2	0.0	<2	18	3.0	3.5	3.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
4	Pump 9 :South fish pumphouse unwatering sump discharge	2.2	0.0	<2	0.0	<2	180	10	8.7	10	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
5	MU 1 Air Cooler non-contact cooling water	1.7	0.0	<2	0.0	<2	49	3.4	49	3.4	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
6	MU1 Thrust bearing non-contact cooling water	0.2	0.0	<2	0.0	<2	7.1	4.9	7.1	4.9	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
7	MU2 Air Cooler non-contact cooling water	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	MU2 Thrust bearing non-contact cooling water	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	MU3 Air Cooler non-contact cooling water	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	MU3 Thrust bearing non-contact cooling water	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	MU4 Non-contact cooling water	2.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	MU5 Non-contact cooling water	2.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	MU6 Non-contact cooling water	2.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	Combined Drainage and unwater sump discharge	15	0.0	<2	0.0	<2	378	3.0	101	3.0	NA	NA	0.0	<0.05	0.0	<0.05	517	4.1	139	4.1
15	HVAC discharge	1.6	86	6.3	86	6.3	205	15	205	15	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
16	Transformer Cool 1-1	0.3	0.0	<2	0.0	<2	6.4	2.8	6.4	2.8	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
17	Transformer Cool 1-2	0.3	0.0	<2	0.0	<2	6.2	2.6	6.2	2.6	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
18	Transformer Cool 2-1	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	Transformer Cool 2-2	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	Transformer Cool 3-1	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	Transformer Cool 3-2	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Average	26	8.1	9.5	8.1	111	5.9	40	5.9	NA	NA	0.1	0.1	0.0	0.1	52	2.1	22	4.3
		Minimum	0.0	6.3	0.0	6.3	6.2	2.6	3.5	2.6	NA	NA	0.0	0.1	0.0	0.1	0.0	0.1	0.0	4.1
		Maximum	177	9.8	86	9.8	378	15	205	15	NA	NA	1.0	0.1	0.1	0.1	517	4.1	139	4.4

Total Maximum Daily Discharge (MGD)	39.8
Flow-Weighted Average Temperature (°C)	21.4

Outfall Number	Outfall Description	Max Daily COD (lbs)	Max Daily COD (mg/L)	Avg Daily COD (lbs)	Avg Daily COD (mg/L)	Max Daily TOC (lbs)	Max Daily TOC (mg/L)	Avg Daily TOC (lbs)	Avg Daily TOC (mg/L)	Max Daily Ammonia (lbs)	Max Daily Ammonia (mg/L)	Avg Daily Ammonia (lbs)	Avg Daily Ammonia (mg/L)	Discharge Flow (gpm)	pH	Winter Temp (C)	Summer Temp (C)
1	Navigation lock spump 3: tainter valve #1 Drainage Sump discharge	0.0	<10	0.0	<10	31	1.7	1.4	1.7	0.0	<0.03	0.0	<0.03	1500	7.5-8.5	-	22
2	Nav Lock Pump 4: North Fish Pumphouse Unwaterins sump discharge	3.8	4.4	3.8	4.4	123	6.8	23	6.8	0.0	<0.03	0.0	<0.03	1500	7.0-8.0	-	15
3	Nav Lock Pump 8: North Non-Overflow Drainage Sump Discharge	0.0	<10	0.0	<10	9.0	1.5	1.7	1.5	0.0	<0.03	0.0	<0.03	500	7.5-8.5	-	19
4	Pump 9 :South fish pumphouse unwatering sump discharge	0.0	<10	0.0	<10	29	1.6	1.4	1.6	0.0	<0.03	0.0	<0.03	1500	7.5-8.5	-	21
5	MU 1 Air Cooler non-contact cooling water	0.0	<10	0.0	<10	30	2.1	30	2.1	0.7	0.0	0.7	0.0	1200	7.0 - 8.0	-	24
6	MU1 Thrust bearing non-contact cooling water	0.0	<10	0.0	<10	3.0	2.1	3.0	2.1	0.1	0.0	0.1	0.0	120	7.0-8.0	-	26
7	MU2 Air Cooler non-contact cooling water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1200	-	-	-
8	MU2 Thrust bearing non-contact cooling water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120	-	-	-
9	MU3 Air Cooler non-contact cooling water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1200	-	-	-
10	MU3 Thrust bearing non-contact cooling water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120	-	-	-
11	MU4 Non-contact cooling water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1950	-	-	-
12	MU5 Non-contact cooling water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1950	-	-	-
13	MU6 Non-contact cooling water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1950	-	-	-
14	Combined Drainage and unwater sump discharge	0.0	<10	0.0	<10	214	1.7	57	1.7	0.0	<0.03	0.0	<0.03	10500	7.0 - 8.0	-	18
15	HVAC discharge	260	19	260	19	59	4.3	59	4.3	0.0	<0.03	0.0	<0.03	1140	7.0 - 8.0	-	
16	Transformer Cool 1-1	0.0	<10	0.0	<10	5.3	2.2	5.3	2.2	0.1	0.0	0.1	0.0	200	7.5-8.5	-	21
17	Transformer Cool 1-2	0.0	<10	0.0	<10	5.8	2.4	5.8	2.4	0.0	<0.03	0.0	<0.03	200	7.5 - 8.5	-	24
18	Transformer Cool 2-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	-	-	-
19	Transformer Cool 2-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	-	-	-
20	Transformer Cool 3-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	-	-	-
21	Transformer Cool 3-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	-	-	-
	Average	26	12	26	12	51	2.6	19	2.6	0.1	0.0	0.1	0.0	1317	7.25 - 8.25	-	21
	Minimum	0.0	4.4	0.0	4.4	3.0	1.5	1.4	1.5	0.0	0.0	0.0	0.0	120	7.0 - 8.0	-	15
	Maximum	260	19	260	19	214	6.8	59	6.8	0.7	0.0	0.7	0.0	10500	7.5 - 8.5	-	26

Lower Monumental Lock and Dam Permit Application Data, Total Design Flow, and Flow-Weighted Average Temperature

Outfall Number	Outfall Description	Max Daily Value Flow Rate (MGD)	Max Daily BOD (lbs)	Max Daily BOD (mg/L)	Avg Daily BOD (lbs)	Avg Daily BOD (mg/L)	Max Daily TSS (lbs)	Max Daily TSS (mg/L)	Avg Daily TSS (lbs)	Avg Daily TSS (mg/L)	Fecal (lbs)	Fecal (mg/L)	Max Daily TRC (lbs)	Max Daily TRC (mg/L)	Avg Daily TRC (lbs)	Avg Daily TRC (mg/L)	Max Daily Oil and Grease (lbs)	Max Daily Oil and Grease (mg/L)	Avg Daily Oil and Grease (lbs)	Avg Daily Oil and Grease (mg/L)
1	drainage sump	2.9	0.0	<2	0.0	<2	67	2.8	62	2.8	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
2	unwatering sump	11	0.0	<2	288	3.2	162	3.2	162	3.2	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
3	heat pump	1.8	42	2.8	42	2.8	1111	74	1111	74	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
4	emergency diesel generator cooling discharge	0.6	0.0	<2	0.0	<2	23	4.3	0.0	4.3	NA	NA	0.0	<0.05	0.0	<0.05	7.0	1.3	0.0	1.3
5	generator cooling water unit 1	2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	generator cooling water unit 2	2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	generator cooling water unit 3	2.2	0.0	<2	0.0	<2	108	6.0	108	6.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
8	generator cooling water unit 4	1.7	0.0	<2	0.0	<2	43	3.0	43	3.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
9	generator cooling water unit 5	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	generator cooling water unit 6	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	Transformer tailwater discharge (01)	0.0	0.0	<2	0.0	<2	1.3	6.2	1.3	6.2	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
11b	Transformer tailwater discharge (02)	0.0	0.0	<2	0.0	<2	1.1	5.1	1.1	5.1	NA	NA	0.0	0.1	0.0	0.1	0.3	1.2	0.3	1.2
		Average	5.3	3	41	3	190	13	186	13	NA	NA	0.0	0.1	0.0	0.1	0.9	1.3	0.0	1.3
		Minimum	0.0	2.8	0.0	2.8	1.1	2.8	0.0	2.8	NA	NA	0.0	0.1	0.0	0.1	0.0	1.2	0.0	1.2
		Maximum	42	3	288	3	1111	74	1111	74	NA	NA	0.0	0.1	0.0	0.1	7.0	1.3	0.3	1.3

Total Maximum Daily Discharge (MGD)	27.8
Flow-Weighted Average Temperature (°C)	17.2

Outfall Number	Outfall Description	Max Daily COD (lbs)	Max Daily COD (mg/L)	Avg Daily COD (lbs)	Avg Daily COD (mg/L)	Max Daily TOC (lbs)	Max Daily TOC (mg/L)	Avg Daily TOC (lbs)	Avg Daily TOC (mg/L)	Max Daily Ammonia (lbs)	Max Daily Ammonia (mg/L)	Avg Daily Ammonia (lbs)	Avg Daily Ammonia (mg/L)	Discharge Flow (gpm)	pH	Winter Temp (C)	Summer Temp (C)
1	drainage sump	202	8.4	187	8.4	52	2.2	48	2.2	0.0	<0.03	0.0	<0.03	2000	7.0-8.0	-	20
2	unwatering sump	0.0	<10	0.0	<10	144	1.6	82	1.6	0.0	<0.03	0.0	<0.03	7500	7.0-8.0	-	17
3	heat pump	420	28	420	28	42	2.8	42	2.8	0.0	<0.03	0.0	<0.03	1250	7.0-8.0	-	21
4	emergency diesel generator cooling discharge	0.0	<10	0.0	<10	9.7	1.8	0.0	1.8	0.2	0.0	0.0	0.0	450	8.0-9.0	-	23
5	generator cooling water unit 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1500	-	-	-
6	generator cooling water unit 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1500	-	-	-
7	generator cooling water unit 3	0.0	<10	0.0	<10	43	2.4	43	2.4	0.0	<0.03	0.0	<0.03	1500	8.0-9.0	-	22
8	generator cooling water unit 4	0.0	<10	0.0	<10	38	2.6	38	2.6	0.0	<0.03	0.0	<0.03	1200	8.0-9.0	-	21
9	generator cooling water unit 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1200	-	-	-
10	generator cooling water unit 6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1200	-	-	-
11	Transformer tailwater discharge (01)	0.0	<10	0.0	<10	0.4	1.9	0.4	1.9	0.0	<0.03	0.0	<0.03	18	7.0-8.0	-	20
11b	Transformer tailwater discharge (02)	0.0	<10	0.0	<10	0.5	2.2	0.5	2.2	0.0	<0.03	0.0	<0.03	18	7.0-8.0	-	18
	Average	78	18	76	18	41	2.2	32	2.2	0.0	0.0	0.0	0.0	1611	na	-	20
	Minimum	0.0	8.4	0.0	8.4	0.4	1.6	0.0	1.6	0.0	0.0	0.0	0.0	18.0	0	-	17
	Maximum	420	28	420	28	144	3	82	3	0.2	0.0	0.0	0.0	7500	0	-	23

Little Goose Lock and Dam Permit Application Data, Total Design Flow, and Flow-Weighted Average Temperature

Outfall Number	Outfall Description	Max Daily Value Flow Rate (MGD)	Max Daily BOD (lbs)	Max Daily BOD (mg/L)	Avg Daily BOD (lbs)	Avg Daily BOD (mg/L)	Max Daily TSS (lbs)	Max Daily TSS (mg/L)	Avg Daily TSS (lbs)	Avg Daily TSS (mg/L)	Fecal (lbs)	Fecal (mg/L)	Max Daily TRC (lbs)	Max Daily TRC (mg/L)	Avg Daily TRC (lbs)	Avg Daily TRC (mg/L)	Max Daily Oil and Grease (lbs)	Max Daily Oil and Grease (mg/L)	Avg Daily Oil and Grease (lbs)	Avg Daily Oil and Grease (mg/L)
1	drainage sump	1.7	0.0	<2	0.0	<2	29	2.0	21	2.0	NA	NA	0.0	<0.05	0.0	<0.05	78	5.4	58	5.4
		1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	2.3	24.6	2.3
2	unwatering pump	13	0.0	<2	0.0	<2	110	1.0	47	1.0	NA	NA	0.0	<0.05	0.0	<0.05	132	1.2	57	1.2
		13	-	-	-	-	-	-	-	-	NA	NA	-	-	-	-	0.0	<1.0	0.0	<1.0
3	heat pump outfall	0.9	0.0	<2	0.0	<2	7.2	1.0	3.9	1.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
4	emergency diesel generator cooling water	0.0	0.0	<2	0.0	<2	0.0	<2	0.0	<2	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
5	Cooling water discharge unit 1	2.8	253	11	253	11	445	19	445	19	NA	NA	0.0	<0.05	0.0	<0.05	40	1.7	40	1.7
		2.8	-	-	-	-	-	-	-	-	NA	NA	-	-	-	-	40	1.7	40	1.7
6	Cooling water discharge unit 2	2.8	87	3.7	87	3.7	24	1.0	24	1.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
7	Cooling water discharge unit 3	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Cooling water discharge unit 4	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Cooling water discharge unit 5	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Cooling water discharge unit 6	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	North shore diesel generator drain	0.0	0.0	<2	0.0	<2	0.0	2.0	0.0	2.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	1.2	0.0	1.2
		0.0	-	-	-	-	-	-	-	-	NA	NA	-	-	-	-	0.0	1.2	0.0	1.4
12	north shore sump pump #2 drain	0.8	0.0	<2	0.0	<2	0.0	<2	0.0	<2	NA	NA	0.0	<0.05	0.0	<0.05	8.1	1.2	2.5	1.2
		0.8	-	-	-	-	-	-	-	-	NA	NA	-	-	-	-	8.1	1.2	0.0	<1
13	navigation lock fill valve sump	0.0	0.4	18	0.4	18	0.9	37	0.9	37	NA	NA	0.0	0.1	0.0	0.1	1.5	61	1.5	61
		0.0	-	-	-	-	-	-	-	-	NA	NA	-	-	-	-	0.1	3.1	0.1	3.1
14	visitors center A.C drain	0.0	0.0	<2	0.0	<2	0.0	<2	0.0	<2	NA	NA	0.0	0.1	0.0	0.1	0.2	1.1	0.1	1.1
		0.0	-	-	-	-	-	-	-	-	NA	NA	-	-	-	-	0.0	<1	0.0	<1
15	Navigation lock drainage	8.1	285	16	0.6	16	108	6.0	0.2	6.0	NA	NA	1.4	0.1	0.0	0.1	292	16	0.6	16
		0.0	-	-	-	-	-	-	-	-	NA	NA	-	-	-	-	79	4.4	0.2	4.4
		Average	57	12	31	12	66	8.6	49	8.6	NA	NA	0.1	0.1	0.0	0.1	37	7.3	12	7.8
		Minimum	0.0	3.7	0.0	3.7	0.0	1.0	0.0	1.0	NA	NA	0.0	0.1	0.0	0.1	0.0	1.1	0.0	1.1
		Maximum	285	18	253	18	445	37	445	37	NA	NA	1.4	0.1	0.0	0.1	292	61	58	61

Total Maximum Daily Discharge (MGD)	40.1
Flow-Weighted Average Temperature (°C)	19.4

Outfall Number	Outfall Description	Max Daily COD (lbs)	Max Daily COD (mg/L)	Avg Daily COD (lbs)	Avg Daily COD (mg/L)	Max Daily TOC (lbs)	Max Daily TOC (mg/L)	Avg Daily TOC (lbs)	Avg Daily TOC (mg/L)	Max Daily Ammonia (lbs)	Max Daily Ammonia (mg/L)	Avg Daily Ammonia (lbs)	Avg Daily Ammonia (mg/L)	Discharge Flow (gpm)	pH	Winter Temp (C)	Summer Temp (C)
1	drainage sump	89	6.2	66	6.2	24	1.7	18	1.7	1.6	0.1	1.2	0.1	1200	7.0-8.0	-	17
		-	-	-	-	-	-	-	-	-	-	-	-	1200		-	
2	unwatering pump	770	7.0	330	7.0	189	1.7	81	1.7	6.5	0.1	2.8	0.1	9150	7.0-8.0	-	17
		-	-	-	-	-	-	-	-	-	-	-	-	9150	-	-	-
3	heat pump outfall	76	11	41	11	15	76	8.4	76	0.7	0.1	0.4	0.1	600	7.0-8.0	-	28
4	emergency diesel generator cooling water	0.0	<5	0.0	<5	0.1	0.2	0.1	0.2	0.0	0.1	0.0	0.1	30	7.0-8.0	-	28
5	Cooling water discharge unit 1	595	25	595	25	142	6.1	142	6.1	4.5	0.2	4.5	0.2	1950	7.0-8.0	-	23
		-	-	-	-	-	-	-	-	-	-	-	-	1950	-	-	-
6	Cooling water discharge unit 2	263	11	262.6	11	61	2.6	60.6	2.6	2.0	0.1	2.0	0.1	1970	7.0-8.0	-	23
7	Cooling water discharge unit 3	-	-	-	-	-	-	-	-	-	-	-	-	1690	-	-	-
8	Cooling water discharge unit 4	-	-	-	-	-	-	-	-	-	-	-	-	1690	-	-	-
9	Cooling water discharge unit 5	-	-	-	-	-	-	-	-	-	-	-	-	1690	-	-	-
10	Cooling water discharge unit 6	-	-	-	-	-	-	-	-	-	-	-	-	1690	-	-	-
11	North shore diesel generator drain	0.0	<5	0.0	<5	0.0	0.5	0.0	0.5	0.0	0.1	0.0	0.1	1.6	7.0-8.0	-	24
		-	-	-	-	-	-	-	-	-	-	-	-	1.6	-	-	-
12	north shore sump pump #2 drain	0.0	<2	0.0	<2	9.7	1.4	3.0	1.4	0.8	0.1	0.2	0.1	560	8.0-9.0	-	15
		-	-	-	-	-	-	-	-	-	-	-	-	560	-	-	-
13	navigation lock fill valve sump	2.7	112	2.7	112	0.1	2.8	0.1	2.8	0.0	0.1	0.0	0.1	2.0	7.0-8.0	-	17
		-	-	-	-	-	-	-	-	-	-	-	-	2.0	-	-	-
14	visitors center A.C drain	0.0	<5	0.0	<5	0.2	1.1	0.1	1.1	0.0	0.1	0.0	0.1	13	7.0-8.0	-	28
		-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-
15	Navigation lock drainage	618	34	1.2	34	115	6.4	0.2	6.4	1.3	0.1	4.7	0.1	5600.0	7.0-8.0	-	17
		-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-
	Average	219	30	118	30	51	9	29	9	1.6	0.1	1.4	0.1	1771	7.0-8.0	-	22
	Minimum	0.0	6.2	0.0	6.2	0.0	0.2	0.0	0.2	0.0	0.1	0.0	0.1	1.6	7.0-8.0	-	15
	Maximum	770	112	595	112	189	76	142	76	6.5	0.2	4.7	0.2	9150	8.0-9.0	-	28

Lower Granite Lock and Dam Permit Application Data, Total Design Flow, and Flow-Weighted Average Temperature

Outfall Number	Outfall Description	Max Daily Value Flow Rate (MGD)	Max Daily BOD (lbs)	Max Daily BOD (mg/L)	Avg Daily BOD (lbs)	Avg Daily BOD (mg/L)	Max Daily TSS (lbs)	Max Daily TSS (mg/L)	Avg Daily TSS (lbs)	Avg Daily TSS (mg/L)	Fecal (lbs)	Fecal (mg/L)	Max Daily TRC (lbs)	Max Daily TRC (mg/L)	Avg Daily TRC (lbs)	Avg Daily TRC (mg/L)	Max Daily Oil and Grease (lbs)	Max Daily Oil and Grease (mg/L)	Avg Daily Oil and Grease (lbs)	Avg Daily Oil and Grease (mg/L)
1	drainage sump	2.9	0.0	<2	0.0	<2	48	2.0	18	2.0	NA	NA	0.0	<0.05	0.0	<0.05	31.2	1.3	12	1.3
2	unwatering sump	11	0.0	<2	0.0	<2	180	2.0	19	2.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
3	generator cooling water unit 1	3.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3a	emergency diesel generator cooling	0.1	0.0	<2	0.0	<2	1.3	2.0	0.0	2.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
4	generator cooling water unit 2	1.7	142	9.8	142	9.8	72	5.0	72	5.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
5	generator cooling water unit 3	1.7	83	5.8	83	5.8	29	2.0	29	2.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
6	generator cooling water unit 4	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	generator cooling water unit 5	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	generator cooling water unit 6	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	heat pump non-contact cooling water	1.7	75	5.4	75	5.4	14	1.0	14	1.0	NA	NA	0.0	<0.05	0.0	<0.05	0.0	<1	0.0	<1
11	CNO sump discharge (2 pumps with two discharges from one sump)	1.8	84	5.7	32	5.7	104	7.0	39	7.0	NA	NA	0.0	<0.05	0.0	<0.05	19.4	1.3	7.4	1.3
		Average	55	7	47	7	64	3.0	27	3.0	NA	NA	0.0	#DIV/0!	0.0	#DIV/0!	7.2	1.3	2.7	1.3
		Minimum	0.0	5.4	0.0	5.4	1.3	1.0	0.0	1.0	NA	NA	0.0	0.0	0.0	0.0	0.0	1.3	0.0	1.3
		Maximum	142	10	142	10	180	7.0	72	7.0	NA	NA	0.0	0.0	0.0	0.0	31.2	1.3	12	1.3
	Total Maximum Daily Discharge (MGD)	29.0																		
	Flow-Weighted Average Temperature (°C)	20.2																		

Outfall Number	Outfall Description	Max Daily COD (lbs)	Max Daily COD (mg/L)	Avg Daily COD (lbs)	Avg Daily COD (mg/L)	Max Daily TOC (lbs)	Max Daily TOC (mg/L)	Avg Daily TOC (lbs)	Avg Daily TOC (mg/L)	Max Daily Ammonia (lbs)	Max Daily Ammonia (mg/L)	Avg Daily Ammonia (lbs)	Avg Daily Ammonia (mg/L)	Discharge Flow (gpm)	pH	Winter Temp (C)	Summer Temp (C)
1	drainage sump	143	5.9	54	5.9	51	2.1	19	2.1	3.9	0.2	1.5	0.2	2000	7.0-8.0	-	19
2	unwatering sump	0.0	<5	0.0	<5	100	1.1	10	1.1	5.8	0.1	0.6	0.1	7500	7.0-8.0	-	17
3	generator cooling water unit 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2200	-	-	-
3a	emergency diesel generator cooling	5.0	7.6	0.0	7.6	1.1	1.7	0.0	1.7	0.1	0.1	0.0	0.1	55	7.0-8.0	-	34
4	generator cooling water unit 2	293	20	293	20	66	4.6	66	4.6	2.4	0.2	2.4	1.7	1200	7.0-8.0	-	23
5	generator cooling water unit 3	206	14	206	14	48	3.3	48	3.3	1.7	0.1	1.7	0.1	1200	7.0-8.0	-	24
6	generator cooling water unit 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1200	-	-	-
7	generator cooling water unit 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1200	-	-	-
8	generator cooling water unit 6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1200	-	-	-
9	heat pump non-contact cooling water	177	13	177	13	43	3.1	43	3.1	1.4	0.1	1.4	0.1	1161	7.0-8.0	-	22
11	CNO sump discharge (2 pumps with two discharges from one sump)	286	19	107	19	65	4.4	24	4.4	1.9	0.1	0.7	0.1	1240	7.0-8.0	-	19
	Average	158	13	120	13	53	2.9	30	2.9	2.5	0.1	1.2	0.3	1832	7.0-8.0	-	22
	Minimum	0.0	5.9	0.0	5.9	1.1	1.1	0.0	1.1	0.1	0.1	0.0	0.1	55.0	6.5-7.5	-	17
	Maximum	293	20	293	20	100	5	66	5	6	0.2	2	1.7	7500	7.0-8.0	-	34