Low Impact Hydropower Institute Recertification Application

Willamette Falls Hydroelectric Project (FERC No. 2233)

September 2017
LIHI #33

Table of Contents

1 Site Description 1
1.1 Project Description 1
1.2 Project Facilities 4
1.2.1 Dam 4
1.2.2 West Linn Paper Company's Grinder Rooms 4
1.2.3 ODFW Fish Ladder 4
1.2.4 Unit 13 Bypass 4
1.2.5 North Fish Bypass 4
1.2.6 Flow Control Structure 4
1.3 Project Operations 5
1.4 Facility Description Information 5
2 Standards Matrix 10
2.1 Project ZOE 10
2.2 Impoundment ZOE 10
3 Supporting Information 12
3.1 Ecological Flow Standard 12
3.1.1 Project ZOE 12
3.1.2 Impoundment ZOE 12
3.2 Water Quality Standards 13
3.2.1 Project ZOE 13
3.2.2 Impoundment ZOE 15
3.3 Upstream Fish Passage 16
3.3.1 Project ZOE 16
3.3.2 Impoundment ZOE 18
3.4 Downstream Fish Passage 19
3.4.1 Project ZOE 19
3.4.2 Impoundment ZOE 23
3.5 Shoreline and Watershed Protection Standards 23
3.5.1 Project ZOE 23
3.5.2 Impoundment ZOE 24
3.6 Threatened and Endangered Species Standards 25
3.6.1 Project ZOE 25
3.6.2 Impoundment ZOE 26
3.7 Cultural and Historic Resources Standards 26
3.7.1 Project ZOE 26
3.7.2 Impoundment ZOE 28

3.8 Recreational Resources Standards 28
3.8.1 Project ZOE 28
3.8.2 Impoundment ZOE 28
4 Contacts 30
4.1 Agency Contacts 31
4.2 Non-governmental Contacts 33
5 Sworn Statement 34

Figures

Figure 1. Other industrial uses at the Willamette Falls Hydroelectric Project. 2
Figure 2. Key structures at Willamette Falls Hydro Electric Project 3
Figure 3.The two Zones of Effect for the Willamette Falls Project (FERC #2233) 11
Figure 4. Willamette Falls Watershed 36
Figure 5. Willamette Falls FERC Project Boundary and recreation areas. 37
Figure 6. TWS Powerhouse (looking west across river into tailrace area) 39
Figure 7. View of the Falls looking upstream during high flow conditions 39
Figure 8. Upstream end of ODFW Willamette Falls Fish Ladder 40
Figure 9. North Fish Bypass System tailrace outfall for downstream migrants 40
Figure 10. Flow Control Structure at apex of Falls. It consists of three inflatable bladder gates. Picture shows FCS in fully raised (closed) position. 41
Figure 11. Adult lamprey curb (looking upstream) on top of ODFW Fish Ladder (left). Lamprey exit gate (right). 41
Figure 12. Installation of lamprey passage ramp 42

Tables

Table 1. Table B-1. Facility Description Information for Willamette Falls Project (LIHI #33). 5
Table 2. Reaches of the Willamette River that are on the 2012 303(d) list and include or are immediately downstream of the Project. 13
Table 3. Performance Goals for the Upstream Passage of Pacific lamprey and salmonids at the Willamette Falls Project (Nation Marine Fisheries Services, Section 18 Fishway Prescriptions). 17
Table 4. Performance Goals for the downstream passage of Pacific lamprey and salmonids at the Willamette Falls Project (National Marine Fisheries Services, Section 18 Fishway Prescriptions) 20
Table 5. Threatened, endangered, and sensitive fish species known to occur in the Willamette Falls Project area. 25

Appendices

Appendix A Site Maps
Appendix B Project Photographs
Appendix C Water Quality

Acronyms

ACOE	United States Army Corps of Engineers
BHPC	Blue Heron Paper Company
CFS	Cubic Feet per Second
CRWG	Cultural Resources Working Group
CWA	Clean Water Act
DO	Dissolved Oxygen
FCS	Flow Control Structure
FERC	Federal Energy Regulatory Commission
FWS	United States Fish and Wildlife Service
HPMP	Historic Properties Management Plan
LCR	Lower Columbia River
MBR	Manual for Built Resources
MSL	Mean Sea Level
MW	Megawatt
NFB	North Fish Bypass
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
PA	Programmatic Agreement
PGE	Portland General Electric
PIT	Passive Integrated Transponder
RM	River Mile
RTIP	Recreation Trails Implementation Plan
SHPO	State Historic Preservation Office
TDG	Total Dissolved Gas
TES	Threatened, Endangered, or Sensitive
TMDL	Total Maximum Daily Load
TWS	T.W. Sullivan Powerhouse
UWR	Upper Willamette River
WLPC	West Linn Paper Company
WLPRD	West Linn Parks and Recreation Department
WQMMP	Water Quality Monitoring and Management Plan
ZOE	Zone of Effect

1 Site Description

The Willamette Falls Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) No. 2233, is owned and operated by Portland General Electric Company (PGE). The Project is on the Willamette River at river mile (RM) 26.5. It lies within the city limits of Oregon City on the east shore and the City of West Linn on the west shore, and is in a highly populated, industrialized urban setting about 10 miles south of downtown Portland.

The Willamette River flows north to its confluence with the Columbia River in Portland and drains an area of approximately 11,478 sq. mi (see Appendix A, Figure 4). Willamette Falls (the Falls) is a horseshoe-shaped, 40-foot-high, natural waterfall that marks the head of the tidally influenced lower Willamette River.

The general project area has been home to hydroelectric generation for more than 125 years, beginning with PGE's Station A in 1889 and continuing to this day with PGE's T.W. Sullivan (TWS) Powerhouse, built in 1895. Multiple paper mills have also operated at the Falls for more than a century (Figure 1). Historically the area was also home to flour, saw, and pulp mill operations that no longer operate. A navigation canal and locks on the west bank of the river operated from 1873 until 2012, when the US Army Corps of Engineers (ACOE) placed the Locks in inoperable, care-taker status. The locks and canal system used to provide 30 ft of lift for commercial barge transport and recreational boat traffic. The ACOE is currently conducting a disposition study to explore transfer of ownership of the locks and canal.

1.1 Project Description

The FERC project boundary of the Willamette Falls Project encompasses 97.23 acres. On the west shore of the Willamette River, the boundary includes the TWS Powerhouse, portions of the Willamette Falls Dam, and extends approximately four miles upriver to include a portion of Willamette Park, operated by the City of West Linn (see Appendix A, Figure 5). On the east shore, the boundary includes the decommissioned Blue Heron Paper Company (BHPC) Powerhouse foundation and associated buildings and portions of the Willamette Falls Dam. The key Project structures that are identified in Figure 3 occupy approximately three acres of land.

The submerged geological formation that forms Willamette Falls creates a pool extending upstream from RM 26.5 to approximately RM 56. The surface area of the pool is approximately 1,991 acres. Maximum inundation upstream of Willamette Falls occurs during high water when the flashboards are out. Given the Project's highly developed and industrialized setting, the impoundment was not included within the FERC project boundary.

Most of the property within the project boundary is owned by PGE. Lands within the project boundary not owned by PGE include a small tract of land under the BHPC mill site, and one small state-owned parcel along the dam's walkway on the Oregon City side. A portion of the Oregon Department of Fish and Wildlife (ODFW) fish ladder and the dam are located on a state-owned parcel west of the most upstream point of the Falls.

A tri-government partnership between Portland Metro, Clackamas County, and Oregon City is currently proposing the Riverwalk Project along the east shore of the river which will provide public access and viewership to the Falls. Falls Legacy, Inc., a private entity, also has mixed-use development plans at the decommissioned BHPC site. The current phase of the Riverwalk Project does not include PGE structures.

Figure 1. Other industrial uses at the Willamette Falls Hydroelectric Project.

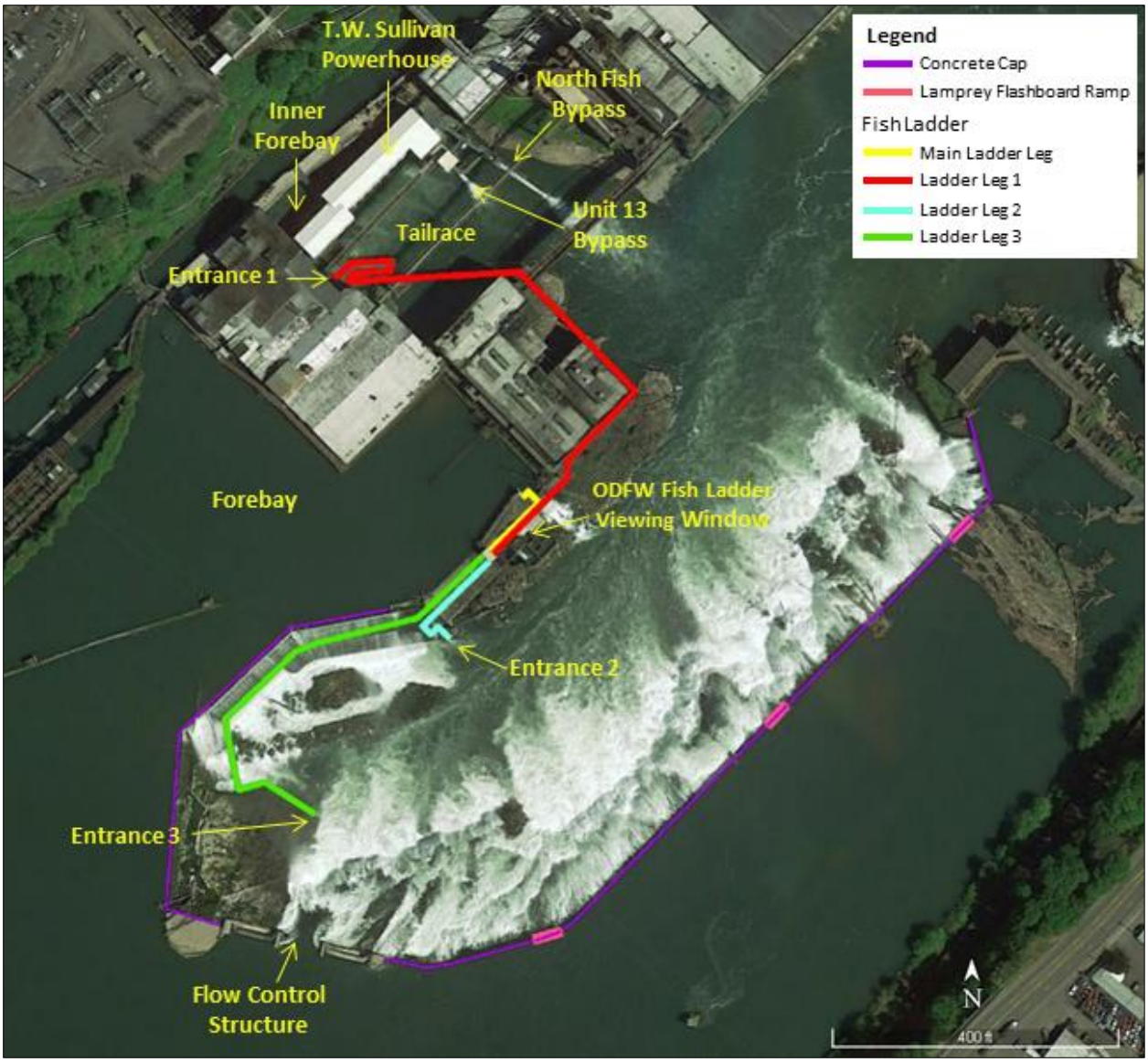

Figure 2. Key structures at Willamette Falls Hydro Electric Project

1.2 Project Facilities

Key Project structures are described below and identified in **Error! Reference source not found.**2. Photographs of these structures are in Appendix B.

1.2.1 Dam

The horseshoe-shaped project dam is located along the crest of Willamette Falls and consists principally of a 600-foot spillway section, a 2,300-foot dam topped with seasonal flashboards, the TWS Powerhouse containing 13 units with a total generating nameplate capacity of 15.5 megawatts (MW), and the now-shutdown and decommissioned BHPC Powerhouse that when in operation, contained two units with a total generating capacity of 1.5 MW. In January 2003 when PGE applied for a new FERC license for the Project, BHPC operated the BHPC Powerhouse and was co-licensee for the Project. PGE purchased and shutdown the BHPC Powerhouse in August 2003. The facility was decommissioned in November 2008 as part of fish protection measures agreed to in the 2005 Settlement Agreement for the relicensing of the project (Settlement Agreement) and implemented in the new FERC license. As detailed in Section 1.1, this area is now the location of planned future public/private development.

1.2.2 West Linn Paper Company's Grinder Rooms

The Project also includes the West Linn Paper Company's (WLPC) (formerly Simpson Paper) Grinder Rooms #2 and #3. In 1996, FERC approved the decommissioning of the generating facilities of the project's Simpson Development. However, because these structures and facilities are integral to the Project's dam, they remain in the project boundary.

1.2.3 ODFW Fish Ladder

The fish ladder, owned and operated by ODFW, is located on the west side of the Falls and includes two entrances within the Falls and one at the TWS Powerhouse tailrace.

1.2.4 Unit 13 Bypass

The Unit 13 Bypass is one of two bypasses for downstream migrating fish entering the TWS Powerhouse forebay. It includes an Eicher screen that provides a physical barrier to turbine entrainment for downstream migrant fish guided through the forebay to Unit 13.

1.2.5 North Fish Bypass

Adjacent to and downstream of the Unit 13 Bypass is the second bypass, the North Fish Bypass (NFB). The NFB was installed in 2006 and is designed to pass a flow of up to 500 cubic feet per second (cfs) directly from the forebay to the tailrace during powerhouse operation. It works in conjunction with forebay modifications to improve forebay hydraulics and guide salmonid smolts, fry, and juvenile lamprey as well as adult salmonids (kelts and fallback) away from TWS Powerhouse's turbines.

1.2.6 Flow Control Structure

The Flow Control Structure (FCS), installed in 2007, is situated at the apex of the Falls and consists of three inflatable rubber dams with a concrete foundation flanked by concrete piers. Its primary function is to provide a safer route for downstream fish passage by directing flow into a large pool and softening the landing for fish that use this route. Also, it adjusts based on forebay elevation; it lowers as river flows increase and flashboards are overtopped.

1.3 Project Operations

The Willamette River flows northward emptying into the Columbia River in Portland. The project operates in run-of-river mode and does not provide usable water storage or flood control. Flashboards are added to the dam around the crest of the Falls during low flow periods of the year, typically summer through fall. The flashboards are allowed to washout as flows increase. Under the range of normal operations, the water surface elevation at the dam varies from approximately 55.5 feet mean sea level (MSL) during low flow with the flashboards installed to about 56.5 feet during normal winter flows, when flashboards have washed out.

The Willamette Falls Dam diverts water into the TWS Powerhouse forebay on the west side of the river and it is brought into an inner forebay area (between the ACOE Locks and the Powerhouse). The water intakes for the turbines are located at this inner forebay area of the Powerhouse. Water diverted through the Powerhouse rejoins the main river immediately below the Falls. Since the tidal effect of the Pacific Ocean is evident up to the base of the Falls, the tidal influence affects tailwater elevation and has a small effect on hydroelectric generation.

1.4 Facility Description Information

Table 1. Table B-1. Facility Description Information for Willamette Falls Project (LIHI #33).

Information Type	***Variable Description***	***Response(and reference to further details)***
Name of the Facility	Facility name	Willamette Falls Project (FERC No. 2233)
Location	River name (USGS proper name)	Willamette River
	River basin name	Willamette River Basin
	Nearest town, county, and state	Oregon City, Clackamas County, Oregon
	River mile of dam above next major river	RM 26.5
	Geographic latitude	45.351142
	Geographic longitude	-122.620028
Facility Owner	Application contact names	Mini Sharma-Ogle
	- Facility owner (individual and company names)	Portland General Electric Company
	- Operating affiliate (if different from owner)	N/A
	- Representative in LIHI certification	John Esler, Portland General Electric Company
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates	FERC Project No. 2233 Issuance: December 8, 2005 Expiration: December 8, 2035
	FERC license type or special classification (e.g., "qualified conduit")	Alternative license process - applicant performed Environmental Assessment and stakeholder Settlement Agreement
	Water Quality Certificate identifier and issuance date, plus source agency name	Identifier: Clean Water Act Section 401 Implementation Agreement Willamette Falls Hydroelectric Project

Information Type	*Variable Description*	*Response(and reference to further details)*
		Issuance Date: November 3, 2004 Agency: Oregon Department of Environmental Quality
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	2004 Water Quality Certification 2005 Programmatic Agreement Among FERC & Oregon SHPO 2005 Order Approving Settlement and Issuing New License 2006 Order Approving Decommissioning of Blue Heron Paper Company Powerhouse 2012 Order Approving TW Sullivan Powerhouse Operating Plan
Power Plant Characteristics	Date of initial operation (past or future for operational applications)	1895
	Total name-plate capacity (MW)	15.1 MW
	Average annual generation (MWh)	130,525 MWh (average over last 5 years)
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	Total units: 13 Induction Generator with Kaplan runners: 12 Synchronous Unit with a Francis runner: 1
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Run-of-River
	Dates and types of major equipment upgrades	1954 - Generators were repowered and roof of plant was replaced 2002-2006 - All turbines were replaced except Unit #9 2006: North Fish Bypass installed 2007: Flow Control Structure installed 2016 - Seismic upgrade of Powerhouse was completed 2017 - Outer trash rack replaced and Obermeyer weirs installed on the BHPC Spillway, located at the northeast side of the dam
	Dates, purpose, and type of any recent operational changes	None
	Plans, authorization, and regulatory activities for any facility upgrades	None at this time
Characteristics of Dam, Diversion, or Conduit	Date of construction	1895
	Dam height	A uniform height of 55 feet.
	Spillway elevation and hydraulic capacity	Not applicable
	Tailwater elevation	Tidally influenced, varies throughout the year

Information Type	*Variable Description*	*Response(and reference to further details)*
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	No penstocks at project; water goes through a flume box.
	Dates and types of major, generation-related infrastructure improvements	See Major Equipment Upgrades above
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power; the project does not provide usable water storage or flood control.
	Water source	Willamette River
	Water discharge location or facility	Willamette River
Characteristics of Reservoir and Watershed	Gross volume and surface area at full pool	Surface area: 1,991 acres (86,745,602 square feet). Volume: Sedimentation rate and bathometric data unavailable for Willamette River; consequently, complete data to calculate volume is unavailable.
	Maximum water surface elevation (ft. MSL)	56.5 feet during normal winter flows. Can vary by year.
	Maximum and minimum volume and water surface elevations for designated power pool, if available	N/A
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	There are no dams upstream of the Project on the mainstem Willamette River. There are 13 ACOE Dams and two Eugene Water & Electric Board projects (Project No. 2496 and Project No. 2242) upstream on tributaries to the Willamette River.
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	There are no dams downstream of the Project.
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation	1997 Pacific Northwest Coordination Agreement in effect through September 15, 2024.
	Area inside FERC project boundary, where appropriate	97.23 acres
Hydrologic Setting	Average annual flow at the dam	26,500 cfs* *Flow at the dam is estimated using the flow data from the USGS gage in Salem, Oregon and applying a correction factor based on flow conditions from the tributaries.
	Average monthly flows	Jan 57,372 cfs Jul 8,260 cfs Feb 38,366 cfs Aug 7,157 cfs Mar 36,896 cfs Sep 8,540 cfs

Information Type	*Variable Description*	*Response(and reference to further details)*
		Apr 33,075 cfs Oct 12,242 cfs May 23,811 cfs Nov 26,272 cfs Jun 16,809 cfs Dec 48,565 cfs *See note above
	Location and name of relevant stream gauging stations above and below the facility	**Immediately Upstream** Site Number: USGS 14207740 Latitude 45°20'55", Longitude 122°37'08" NAD27 Site Name: Willamette River Above Falls, at Oregon City, Or **Immediately Downstream** Site Number: USGS 14207770 Latitude 45°21'28", Longitude 122°36'35" NAD27 Site Name: Willamette River Below Falls, at Oregon City, Or
	Watershed area at the dam	Approximately 10,000 square miles
Designated Zones of Effect (ZOE)	Number of zones of effect	Two
	Upstream and downstream locations by river miles	ZOE 1: RM 26.5 (Project ZOE) ZOE 2: RM 26.5 to 56 (Impoundment ZOE)
	Type of waterbody (river, impoundment, by-passed reach, etc.)	ZOE 1: River ZOE 2: River
	Delimiting structures	ZOE 1: Dam to tailwater ZOE 2: Dam to 30 miles upstream
	Designated uses by state water quality agency	Public & Private Domestic Water Supply Industrial Water Supply Irrigation Livestock Watering Fish & Aquatic Life Wildlife & Hunting Fishing Boating Water Contact Recreation Aesthetic Quality Hydro Power Commercial Navigation & Transportation (OAR 340-041-0340, Table 340A)
Additional Contact Information	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	See Section 4.1, page 31
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	See Section 4.2, page 33

Information Type	*Variable Description*	*Response(and reference to further details)*
Photographs and Maps	Photographs of key features of the facility and each of the designated zones of effect	See Appendix B
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	See Appendix A

2 Standards Matrix

At the Project, there are two Zones of Effect: the Project ZOE and the Impoundment ZOE. See Figure 3 for the extent of each zone.

2.1 Project ZOE

	Criterion	*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			X
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			X
H	Recreational Resources	X				

2.2 Impoundment ZOE

	Criterion	*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	Ecological Flow Regimes	X				
B	Water Quality	X				
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources		X			

Figure 3.The two Zones of Effect for the Willamette Falls Project (FERC #2233).

3 Supporting Information

3.1 Ecological Flow Standard

3.1.1 Project ZOE

Criterion	*Standard*	*Instructions*
A	1	Not Applicable / De Minimis Effect: • Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility. • If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained.

Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility.

Figure 2 shows Willamette Falls, TWS Powerhouse, and location of key structures in the Project area. The Willamette Falls Project is a run-of-river project with no ability to store and release water on demand. There are no bypassed reaches at the Project.

If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained.

Because there is no active water storage provided by the Project, PGE uses as much water as its water right and the hydraulic generating capacity at TWS Powerhouse allows. The rest of the river's flow goes over the Falls. Immediately downstream of the Falls, the flows from TWS Powerhouse rejoin the Willamette River, maintaining run-of-river operations.

3.1.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
A	1	Not Applicable / De Minimis Effect: • For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed.

The Impoundment ZOE is outside the Project's FERC boundary. Consequently, fish and wildlife habitat in the Impoundment ZOE is not managed under PGE's FERC license. This criterion is not applicable.

3.2 Water Quality Standards

3.2.1 Project ZOE

Criterion	*Standard*	*Instructions*
B	2	Agency Recommendation: • If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. • Provide a copy of the most recent Water Quality Certificate, including the date of issuance. • Identify any other agency recommendations related to water quality and explain their scientific or technical basis. • Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.

If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.

The Willamette River has long been used for industrial, agricultural, and commercial purposes. As a result, many reaches of the Willamette River that include the Project area are on the State's Clean Water Act (CWA) Section 303(d) list (Table 2). These listings do not reflect the impact of the Project because Oregon Department of Environmental Quality (ODEQ) determined that the Project is not responsible for the conditions in the Willamette River. This determination was made when

- ODEQ issued a 401 Certificate for the Project, with which PGE is in compliance.
- The Willamette Basin Temperature total maximum daily load (TMDL) report found that the Project does not contribute to violations of the temperature standard.
- ODEQ's evaluation of PGE's proposal to increase the flashboard height to improve fish passage performance did not alter ODEQ's prior determinations.

An email from ODEQ confirming that the Project continues to not contribute to the 303(d) impairments listed for waters in the Project's vicinity is in Appendix C.

Table 2. Reaches of the Willamette River that are on the 2012 303(d) list and include or are immediately downstream of the Project.

Parameter	River Miles	Season for Listing
Aldrin	0-54.8	Year Round
Biological Criteria	0-54.8	Year Round
Chlordane	0-24.8	Year Round
Chlorophyll a	0-54.8	Summer
Copper	0-24.8	Year Round
Cyanide	0-24.8	Year Round
DDE 4,4	0-54.8	Year Round
DDT 4,4	0-54.8	Year Round
Dieldrin	0-54.8	Year Round

Parameter	River Miles	Season for Listing
Dioxin	0-54.8	Year Round
E. Coli	0-186.4	Fall/Winter/Spring
Hexachlorobenzene	0-24.8	Year Round
Iron	0-54.8	Year Round
Lead	0-186.4	Year Round
Mercury	0-186.6	Year Round
Pentachlorophenol	0-24.8	Year Round
PCBs	0-54.8	Year Round
Polynuclear Aromatic Hydrocarbons	0-24.8	Year Round
Temperature	0-50.6	Year Round (Non-Spawning)

Source: Oregon Department of Environmental Quality, Oregon's 2012 Integrated Report – Assessment and Database
http://www.deq.state.or.us/wq/assessment/rpt2012/search.asp

Provide a copy of the most recent Water Quality Certificate, including the date of issuance.

The 401 Certification for the Willamette Falls Project was issued on November 2, 2004 and is the current certificate. A copy of it is available on the FERC e-library at

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10356057

Identify any other agency recommendations related to water quality and explain their scientific or technical basis.

Willamette Falls' Water Quality Monitoring and Management Plan (WQMMP) describes the procedures to be used to satisfy requirements of the Water Quality Certification. There were two primary objectives of the WQMMP:

- To determine whether the Project is in compliance with the ODEQ total dissolved gas (TDG) standards.
- To collect TDG data to aid in the identification and/or implementation of adaptive management measures needed to ensure compliance with the ODEQ water quality standards and the § 401 certification.

PGE formally submitted the TDG Report to ODEQ on April 13, 2012. ODEQ, by letter dated June 28, 2012, approved the report as satisfying the requirements of the water quality certificate and that further TDG monitoring/reporting was not required.[1]

[1] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13212458, Willamette Falls Hydroelectric Project 2012 Annual Report, Appendix A, March 22, 2013

Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.

ODEQ's water quality certificate does not include specific measures that address ongoing water quality issues because no project-related water quality impacts from operations were identified. In its evaluation, ODEQ determined with reasonable assurance that the project[2]

- Would not affect ODEQ's standards governing aesthetic conditions, bacterial pollutions, creation of taste and odors, development of fungi, radioisotopes, and total dissolved solids
- Would not contribute to violations or impairment under the biocriteria, nuisance phytoplankton, pH, sedimentation, toxic substances, or turbidity standards
- Would be in compliance with the dissolved oxygen (DO) standard and not contribute to a violation of the temperature standard.

ODEQ's evaluation was premised on certain measures PGE proposed to take in accordance with the new FERC license and the water quality certificate - principally to improve fish passage at the Project, but also to address water quality concerns. Consequently, PGE constructed the FCS at the apex of the Falls to provide a safer route for downstream passage by directing flow into a large pool and softening the landing for fish that use this route. Second, PGE improved fish guidance in the forebay of the TWS Powerhouse, and constructed the NFB to guide fish past the Powerhouse. Third, PGE permanently shut down the unscreened Blue Heron Powerhouse.

3.2.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
B	1	Not Applicable / De Minimis Effect: • If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. • Explain rationale for why facility does not alter water quality characteristics below, around, and above the facility.

If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.

See email in Attachment C.

Explain rationale for why facility does not alter water quality characteristics below, around, and above the facility.

ODEQ has determined that the Project does not alter water quality below, around, and above the facility as explained in Section 3.2.1.

[2] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10356057 – Water Quality Certification

3.3 Upstream Fish Passage

3.3.1 Project ZOE

Criterion	*Standard*	*Instructions*
C	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Migratory fish that occur in the Project ZOE: Chinook salmon, Coho Salmon, Steelhead, Bull trout, Rainbow trout, Coastal cutthroat trout, Pacific lamprey, and white sturgeon.

Identify the proceeding and source, date, and specifics of the agency recommendation applied.

The fish passage and protection measures that PGE has implemented at the Project are contained in a series of interrelated documents. The basic document is the Settlement Agreement, which included proposed license articles that described the requirements that PGE would be required to implement pursuant to the new license. The Settlement Agreement (filed February 2004) also included a Relicensing Implementation Plan that detailed how PGE would implement the requirements of the Settlement Agreement. The proposed license articles pertaining to fish passage were adopted verbatim by NOAA Fisheries and U.S. Fish and Wildlife Service (FWS) in their Section 18 prescriptions, and by reference in ODEQ's 401 certificate. The FERC license adopted verbatim the Section 18 prescriptions (including NOAA Fisheries' "reasonable and prudent measures" pursuant to its Biological Opinion), 401 certificate, and Relicensing Implementation Plan.

Explain the scientific or technical basis for the agency recommendation, including methods and data used.

NMFS Section 18 Fishway Prescriptions identified the two performance goals in Table 3 for the upstream passage of Pacific lamprey and adult salmonids at the Project.[3]

The issue of upstream passage for Pacific lamprey at the project is more complex than for salmonids for several reasons: 1) lamprey passage effectiveness through fishways originally designed for salmonids has been highly variable; 2) lamprey seek out passage over the Falls as well as through the ladder, increasing their potential passage routes; 3) complete understanding of lamprey migratory behavior is lacking; and 4) fisheries managers have only recently begun to examine passage solutions for lamprey.

[3] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10142938 – NOAA Fisheries Modified Fishway Prescriptions and Recommended Terms and Conditions, May 5, 2004

Table 3. Performance Goals for the Upstream Passage of Pacific lamprey and salmonids at the Willamette Falls Project (Nation Marine Fisheries Services, Section 18 Fishway Prescriptions).

Fish species/lifestage	Type of passage	Performance goal
Adult lamprey	Upstream through the Project area	"safe, timely, and effective" qualitative goal without serious injury or mortality: Goal to be further developed through PGE funded study described in Section V.C and Appendix 4 of the Relicensing Implementation Plan
Adult salmonids	Upstream through the Project area	"safe, timely, and effective" qualitative goal without serious injury or mortality

Because of the importance of Pacific lamprey in the Willamette River Basin, the effects of the Project on upstream lamprey passage, and the uncertainties surrounding upstream passage issues for Pacific lamprey generally, the new license requires PGE to implement the Adult Pacific Lamprey Passage Plan which was negotiated in the Settlement Agreement. This plan includes detailed studies to identify specific passage problems and to determine passage effectiveness. The plan also includes provisions for the implementation and evaluation of passage improvements to determine their effectiveness and any necessary refinements.

PGE implemented the Adult Pacific Lamprey Passage Plan outlined in the FERC license between 2005 and 2009.[4] The plan included lamprey passage evaluations and helped PGE develop measures to reduce impacts to Pacific lamprey. It allowed PGE to develop site-specific knowledge regarding adult Pacific lamprey behavior and to assist in implementing effective upstream passage measures for adult Pacific lamprey through the Project. The following measures were developed to support lamprey passage:

- PGE rebuilt Entrance 1 to the ODFW Fish Ladder to improve velocities and attachment points for Pacific Lamprey. The ladder was designed to provide an orifice that contains lower velocities and continuous attachment points. Additionally, bulk head slots were designed for continuous attachment and to avoid 90 degree corners.
- After construction of the FCS at the apex of the Falls, PGE completed adult lamprey passage research in 2010 and based on that research, PGE proposed and constructed in 2011 a new Adult Lamprey Passage structure using the abandoned fish ladder. Annual monitoring has confirmed significant use by adult Pacific lamprey.
- As part of the Adult Pacific Lamprey Passage Plan, PGE continues to install lamprey passage ramps during the seasonal flashboard installation and formed a Lamprey Passage Review Group to periodically meet and review the status of adult lamprey passage at the Falls.
- The adult Pacific lamprey passage research indicated that adult lamprey were using the ODFW fish ladder successfully and efficiently; therefore, no modifications to the internal areas of the fish ladder were required.

[4] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12558075 – Evaluation of Adult Pacific Lamprey Passage at the Willamette Falls Hydroelectric Project, 2009-2010, January 2011

Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Upstream passage for salmonids is provided by the ODFW fish ladder. The fish ladder at Willamette Falls was constructed by ODFW between 1968 and 1971, and major renovations were made in 1996/1997. The existing fish ladder is not a Project feature, and the new FERC license did not make the ladder a part of the Project. However, because the fish ladder addresses several impacts on upstream fish migration associated with the structural features and operation of the Project as well as the natural features at the Falls, the Parties to the Settlement Agreement concluded that it would be appropriate for PGE to provide assurances that the fish ladder will continue to be operated effectively over the term of the new license. While ODFW holds ownership of the ladder and remains responsible for its operation, as well as the operation and maintenance of the fish counting station, the Settlement Agreement provides – and the FERC license requires – that PGE assume fish ladder operations and maintenance (O&M) duties required for proper fish ladder operation. For the life of the license, PGE is responsible for all labor and necessary repair or replacement of equipment and performing annual O&M tasks directly associated with fish ladder operation. Observation and fish counting remains the responsibility of ODFW.

Because the outfall of generating Unit 1 provides attraction flow to Entrance 1 of the fish ladder, PGE is required to operate an auxiliary water source at Entrance 1 of the fish ladder if Unit 1 is inoperable for more than 24 hours during times with upstream migration of anadromous fish. If an auxiliary water source for Entrance 1 of the ODFW Fish Ladder is not available, PGE must shut down all the generating units.

3.3.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
C	1	Not Applicable / De Minimis Effect: • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone.

Migratory fish that occur in the Impoundment ZOE: Chinook salmon, Coho Salmon, Steelhead, Bull trout, Rainbow trout, Coastal cutthroat trout, Pacific lamprey, and white sturgeon.

Explain why the facility does not impose a barrier to upstream fish passage in the designated zone.

The Project does not create a barrier to upstream passage because fish in the impoundment have already passed upstream by way of the fish ladder. This criterion is not applicable.

3.4 Downstream Fish Passage

3.4.1 Project ZOE

Criterion	*Standard*	*Instructions*
D	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.
D	PLUS	Bonus Activities: • If advanced technology has been or will be deployed, explain how it will increase fish passage success relative to other options.

Migratory fish that occur in the Project ZOE: Chinook salmon, Coho Salmon, Steelhead, Bull trout, Rainbow trout, Coastal cutthroat trout, Pacific lamprey, and white sturgeon.

Identify the proceeding and source, date, and specifics of the agency recommendation applied.

The fish passage and protection measures that PGE implemented at the Project are contained in a series of interrelated documents. The basic document is the Settlement Agreement, which included proposed license articles that described the requirements that PGE would be required to implement pursuant to the new license. The proposed license articles pertaining to fish passage were adopted verbatim by NOAA Fisheries and FWS in their Section 18 prescriptions, and by reference in ODEQ's 401 certificate. The FERC license (December 8, 2005) adopted verbatim the Section 18 prescriptions (including NOAA Fisheries' "reasonable and prudent measures" pursuant to its Biological Opinion), and the 401 certificate.

Explain the scientific or technical basis for the agency recommendation, including methods and data used.

A diverse fish fauna occurs in the vicinity of the Project. The anadromous fish resources from the Willamette Basin represent some of the most important runs in the lower Columbia River. Special status species in the basin include spring Chinook, Coho salmon, winter steelhead, bull trout, coastal cutthroat trout, and Pacific lamprey. Upstream of Willamette Falls, spring Chinook and winter steelhead are listed by NOAA Fisheries as threatened under the Endangered Species Act. The primary goal of the Parties to the Settlement Agreement was to improve conditions for anadromous fish runs in the upper Willamette River Basin to fully utilize the available habitat and production capability. Therefore, elements of the Settlement Agreement, as implemented by the FERC license, are designed to enable the Project and all

its associated features to maximize upstream and downstream fish passage effectiveness over the full range of river flows for which the Project maintains operational control.

Table 4 identifies the performance goals for downstream passage of Pacific lamprey and salmonids at the Project. [5]

Table 4. Performance Goals for the downstream passage of Pacific lamprey and salmonids at the Willamette Falls Project (National Marine Fisheries Services, Section 18 Fishway Prescriptions).

Fish species/lifestage	Type of passage	Performance Goal
Juvenile lamprey	Downstream through the powerhouses	"safe, timely, and effective" qualitative goal without serious injury or mortality
Juvenile lamprey	Downstream over the spillway (cap/falls)	"safe, timely, and effective" qualitative goal without serious injury or mortality: Assumed adequate when the standard for juvenile salmonids is met at the spillway (≥97% survival), until appropriate technology is developed to assess juvenile lamprey survival over the controlled flow structure.
Adult lamprey	Downstream at the T.W. Sullivan Powerhouse and at the spillway (cap/falls)	"safe, timely, and effective" qualitative goal without serious injury or mortality
Steelhead kelts (i.e., post-spawning adults) and fallback (adult salmonids)	Downstream at the T.W. Sullivan Powerhouse and at the spillway (cap/falls)	"safe, timely, and effective" qualitative goal without serious injury or mortality

Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

PGE made several modifications to the TWS Powerhouse to improve downstream passage conditions as outlined in the FERC license. In addition to the Unit 13 Eicher Screen fish bypass, modifications included hardening the inner forebay floor, installing a training wall, and re-contouring the inner trash racks to increase flow. These modifications improved hydraulic conditions and worked in concert with the NFB, which provides a high-flow bypass exit to the tailrace to the Willamette River.

Downstream fish Passage evaluations were completed between 2007 and 2009, and 10,690 juvenile Chinook and 3,766 steelhead were tagged and released to determine Fish Guidance Efficiency. Overall,

[5] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10142938 – NOAA Fisheries' Modified Fishway Prescriptions and Recommended Terms and Conditions, May 5, 2004

project results determined the performance standard was above 99% and exceeded the project goal of 98%. Injury rates through the various bypass facilities were low and met performance goals as well.[6]

In addition to powerhouse improvements for downstream survival, improvements were made at the actual Falls itself. These improvements involved the design and construction of the FCS at the apex of the Falls to focus flow into a large pool and soften the landing for downstream migrating fish. This FCS consists of three inflatable bladders each 9 ft high by 50 ft wide. Survival evaluations in 2008 demonstrated survival rates meeting the 97% standard with injury rates at 1.4%.[7] The FCS has proven to be effective to safely passing fish through this focused route.

PLUS: If advanced technology has been or will be deployed, explain how it will increase fish passage success relative to other options.

During negotiations with settlement parties, PGE worked with the parties to develop a creative, site-specific solution for efficient downstream fish passage without the need to fully screen the Project. PGE proposed creating flow conditions at the Project that would allow migratory behavior to guide fish safely around the Powerhouse without screening them out of the water used by the turbines. PGE's solution involved modifying the inner forebay and trash racks to improve hydraulics and constructing a high-flow bypass – the NFB.

Using physical modeling of the forebay, PGE identified modifications to the guidewall that would improve forebay hydraulics. The guidewall was relocated and expanded so that it angles toward the NFB. As the flow is diverted into the generating units, the guidewall narrows so that the velocity in the forebay increases. This sweeping flow is perpendicular to the intake of the 13 turbines so downstream migrating fish can safely guide past the 12 unscreened turbines towards two bypass routes - the Unit 13 Eicher Screen or the NFB. Between Unit 13 and the NFB there is safe route to the tailrace.

Besides controlling velocities, it was important to improve forebay hydraulics so that laminar flow in front of the turbines did not force fish into the units. This was accomplished by modifying the trash racks. The spacing between trash rack bars was narrowed, which reduced swirling and sudden velocity changes in the forebay, nearly eliminating fish impingement. Additionally, to ensure the trash racks remain free of debris build up that could adversely affect fish guidance efficiency and migrant survival, PGE installed an automated trash rack cleaning system.

Fish passage performance was tested using a host of methodologies to validate that forebay modifications met the aggressive license criterion of 98% passage success. Fish passage guidance through the TWS Powerhouse Forebay was confirmed using HI-Z Turb'N Tags, radio telemetry, and passive integrated transponder (PIT) technology where microchips were placed in fish and antennae systems were placed in the fishways. Less than 1% of the downstream migrating fish were entrained

[6] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12226512 - T.W. Sullivan Powerhouse Performance Report, December 2009

[7] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11960697- Exhibit C: Willamette Falls Flow Control Structure Survival and Injury, 2008 Study Results, pg. 117 in 2008 Interim Progress Report: Post Construction Performance Testing

into turbines 1 through 12. Of those entrained, approximately 84% survived. About 4% of the fish went into Unit 13, which is screened and those fish had 100% survival into the tailrace. Ninety-five percent of the migrants entered the NFB where virtually 100% of them were delivered to the tailrace uninjured. Overall survival of downstream migrants through the forebay was above 99.5%. Specifically, fish survival rates in the Powerhouse were 99.6% for Chinook and 99.8% for steelhead, exceeding the 98% passage success criterion.

3.4.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
D	1	Not Applicable / De Minimis Effect: • Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines). • For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

Migratory fish that occur in the Impoundment ZOE: Chinook salmon, Coho Salmon, Steelhead, Bull trout, Rainbow trout, Coastal cutthroat trout, and Pacific lamprey.

The Impoundment ZOE is a free-flowing section of river and does not impose a barrier to downstream fish passage. The criterion is not applicable.

3.5 Shoreline and Watershed Protection Standards

3.5.1 Project ZOE

Criterion	*Standard*	*Instructions*
E	1	Not Applicable / De Minimis Effect: • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

If there are no lands with significant ecological value associated with the facility, document and justify this.

Willamette Falls has been used for industrial and commercial purposes for more than 100 years, and the Project site reflects this long history of development. The Project occupies 88.9 acres within the city limits of West Linn and Oregon City. The majority of this land is used for industrial purposes associated with hydropower generation and paper manufacturing. BHPC's paper mill occupied the east side of the Falls until it was decommissioned in 2008, and WLPC's mill occupies the west side. The abandoned grinder rooms of WLPC's predecessor, Simpson Paper, occupy a site between the apex of the Falls and PGE's TWS Powerhouse. Auxiliary facilities for BHPC and WLPC occupy both shores upstream of the Falls, and the Southern Pacific Railroad runs along the east shore. Highway 99 runs above the railroad. The area adjacent to the shoreline is also heavily developed.

Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

The Parties to the Settlement Agreement were in agreement that it would not be necessary or appropriate to establish a watershed enhancement fund that would achieve the ecological or recreational equivalent of watershed protection. Similarly, the Parties to the Settlement Agreement determined that it would not be necessary or appropriate to establish a shoreline buffer or equivalent watershed protection plan for conservation purposes.

3.5.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
E	1	Not Applicable / De Minimis Effect: • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

If there are no lands with significant ecological value associated with the facility, document and justify this.

The Project FERC boundary runs upstream along the Impoundment ZOE in the Willamette River and then heads west along the Tualatin River (Appendix A – Figure 5). Along the Willamette River, the Project boundary is narrow and discontinuous. It includes Bernert Landing, a recreational trail, and a portion of Willamette Park. The boundary turns northwest at the confluence of the Willamette and Tualatin rivers and includes the Tualatin River and a narrow portion of the shoreline. Although the land within the boundary is undeveloped, it is surrounded by a residential area.

Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

The Parties to the Settlement Agreement were in agreement that it would not be necessary or appropriate to establish a watershed enhancement fund that would achieve the ecological or recreational equivalent of watershed protection. Similarly, the Parties to the Settlement Agreement determined that it would not be necessary or appropriate to establish a shoreline buffer or equivalent watershed protection plan for conservation purposes.

3.6 Threatened and Endangered Species Standards

3.6.1 Project ZOE

Criterion	*Standard*	*Instructions*
F	2	Finding of No Negative Effects: • Identify all listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies. • Provide documentation of a finding of no negative effect of the facility on any listed species in the area from an appropriate natural resource management agency.

Identify all listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies.

Only three threatened, endangered, or sensitive (TES) species occur at or affected by the Project (Table 5).

Table 5. Threatened, endangered, and sensitive fish species known to occur in the Willamette Falls Project area.

Species	Region	Status*
Chinook Salmon	Upper Willamette River Lower Columbia River	Federally Threatened Federally Threatened
Steelhead	Upper Willamette River Lower Columbia River	Federally Threatened Federally Threatened
Coho Salmon	Lower Columbia River	State Endangered/Federally Threatened

*Status based on Oregon Department of Fish and Wildlife's Threatened, Endangered, and Candidate Fish and Wildlife Species in Oregon, revised June 2017.

Provide documentation of a finding of no negative effect of the facility on any listed species in the area from an appropriate natural resource management agency.

NOAA Fisheries in its Biological Opinion concluded that relicensing of the Project under the terms of the Settlement Agreement would not likely jeopardize the continued existence of UWR Chinook salmon, UWR steelhead, Lower Columbia River (LCR) Chinook salmon, LCR steelhead, and (through a conference opinion) LCR Coho salmon.[8] NOAA Fisheries noted that levels of Project-caused injury and mortality under the terms of the new license will represent an improvement over conditions under the previous license, and that adult mortality through the Project appears to be similar to, if not less than, mortality under a "no-Project" scenario.

[8] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10647614 – NOAA Biological Opinion for Endangered Species Act Section 7, June 27, 2005

In response to PGE's proposal to increase the flashboard height by 1.5 feet, NOAA Fisheries stated on December 5, 2006, that it believed that this increase would not represent a significant change in the proposed action considered by NOAA Fisheries' Biological Opinion: "The flashboard height increase would not likely affect the extent of incidental take or modify the analyzed action in a manner that causes an effect to the listed species or critical habitat consider in NMFS' Opinion."

3.6.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
F	1	Not Applicable / De Minimis Effect: • Document that there are no listed species in the facility area or affected riverine zones downstream of the facility. • If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species. • If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.

The same listed species in the Project ZOE are in the Impoundment ZOE. NOAA Fisheries concluded in its Biological Opinion that the Project will likely not jeopardize the continued existence of the listed species and that the terms of the new license will represent an improvement over conditions under the previous license, and that adult mortality through the Project appears to be similar to, if not less than, mortality under a "no-Project" scenario.

3.7 Cultural and Historic Resources Standards

3.7.1 Project ZOE

Criterion	*Standard*	*Instructions*
G	2	Approved Plan: • Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility. • Document that the facility is in compliance with all such plans.
G	PLUS	Bonus Activities: • Document any substantial commitment that the facility has made to restoring one or more significant cultural or historical resource in the vicinity, beyond what is required in existing plans such as a Historic Resources Management Plan.

Provide documentation of all approved state, provincial, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility.

The management of historic properties, including archaeological, historic, and traditional use sites within the Project area is the responsibility of federal, tribal, and state agencies and PGE. Management

is governed by three documents: the Historic Properties Management Plan (HPMP), the Programmatic Agreement (PA), and the license.

The HPMP was submitted to FERC on April 15, 2004 and approved by FERC on September 28, 2005. The Oregon State Historic Preservation Officer and the Commission's Office of Energy Project executed the PA on December 23, 2004. Article 409 of the license requires PGE to implement the PA and HPMP for the Project.

Pursuant to the HPMP, a Cultural Resources Working Group (CRWG) consisting of members from the State Historic Preservation Office (SHPO), Tribes, WLPC, One Willamette Falls Coalition, and ACOE meets annually to discuss the progress of implementing the HPMP and reports its decisions to FERC in the cultural resources annual report.

Also, PGE has developed a Manual for Built Resources (MBR) in consultation with SHPO for reviewing impacts from the Project on historic resources. PGE researches and documents every minor or major undertaking and assesses its impact on documented cultural resources in the area. The MBR is the first such treatise created for any hydroelectric project in the State and now serves as a model document that SHPO requires other hydroelectric plants to adopt.

Document that the facility is in compliance with all such plans.

PGE is in compliance with all FERC requirements for management of cultural resources at Willamette Falls - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12565533.

PLUS: Document any substantial commitment that the facility has made to restoring one or more significant cultural or historical resource in the vicinity, beyond what is required in existing plans such as a Historic Resources Management Plan.

In November of 2016, PGE identified a historic site along the basalt outcroppings of the Locks and Navigation canal on the west shore. This site is a World War II engraving on the rocks with the words, "Buy War Bonds". PGE worked with the property owners (the ACOE) to clear brush, expose the engraving, prepare an archaeological site form, and document it with SHPO. SHPO subsequently issued a Smithsonian trinomial to the historic site. An interpretive panel will be constructed at the location in the future. This action was not a requirement under the HPMP.

3.7.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
G	1	Not Applicable / De Minimis Effect: • Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility. • Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are present on facility lands.

There are no Project structures in the Impoundment ZOE. This criterion is not applicable.

3.8 Recreational Resources Standards

3.8.1 Project ZOE

Criterion	*Standard*	*Instructions*
H	2	Not Applicable / De Minimis Effect: • Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.

Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.

The area around the Project offers a wide range of recreation opportunities and destinations; however, within the Project ZOE there is no recreational access because of the constraints of the highly industrialized site.

3.8.2 Impoundment ZOE

Criterion	*Standard*	*Instructions*
H	1	Agency Recommendation: • Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.

Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.

License Article 410 required PGE to develop, in consultation with the City of West Linn, a Recreation Trails Implementation Plan (RTIP) to provide recreation trails along West Linn's side of the Willamette River, upstream of Willamette Falls. FERC approved the RTIP on March 28, 2007.

PGE granted West Linn Parks and Recreation Department (WLPRD) an easement on land along the Willamette River immediately downstream of Bernert Landing. The RTIP was the only recreational requirement in the project's FERC license.

PGE has also leased land to the City of West Linn for two parks that are located within and adjacent to the Project boundary:

- Bernert Landing, located within the Project boundary, is a two acre park located about two miles upstream of the Falls that provides river access, a dock, parking, and restroom facilities.
- The 19-acre Willamette Park is adjacent to Bernert Landing. It offers river access and a variety of recreational facilities. The Oregon State Marine Board has identified the Willamette River as the most popular water body in the State after the Columbia River. Fishing, waterskiing, personal watercraft use, and pleasure boating occur above and below the Falls.

PGE does not charge any fees for access to the Willamette River through facilities located within the Project boundary. These two parks pre-date the current license.

Document that the facility is in compliance with all such recommendations and plans.

West Linn Parks and Recreation Department (WLPRD) completed trail construction on PGE-owned land in January 2016.

PGE Submittal: https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14280499

FERC Approval: https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14312864

4 Contacts

Project Owner:	
Name and Title	Nick Loos, Plant Manager
Company	Portland General Electric
Phone	503-630-8214
Email Address	Nick.Loos@pgn.com
Mailing Address	33831 SE Faraday Rd, Estacada, Oregon 97023
Project Operator (if different from Owner):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	N/A
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	John Esler Willamette Falls FERC License Manager
Company	Portland General Electric
Phone	503-464-8563
Email Address	John.Esler@pgn.com
Mailing Address	121 SW Salmon Street 3WTC0403 Portland, OR 97204
Party responsible for accounts payable:	
Name and Title	John Esler Willamette Falls FERC License Manager
Company	Portland General Electric
Phone	503-464-8563
Email Address	John.Esler@pgn.com
Mailing Address	121 SW Salmon Street 3WTC0403 Portland, OR 97204

4.1 Agency Contacts

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources **X**, Watersheds **X**, T/E Spp. __, Cultural/Historic Resources , Recreation __):	
Agency Name	Confederated Tribes of the Warm Springs Reservation of Oregon
Name and Title	Cyndi Baker, Fisheries Research and Monitoring Project Leader
Phone	541-553-3586
Email address	cyndi.baker@ctwsbnr.org
Mailing Address	PO Box C Warm Springs, OR 97761-3001

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources **X**, Recreation __):	
Agency Name	Confederated Tribe of Siletz Indians of Oregon
Name and Title	Robert Kentta, Cultural Resources Director
Phone	541-444-8232
Email address	rkentta@ctsi.nsn.us
Mailing Address	PO Box 549 Siletz, OR 97380

Agency Contact (Check area of responsibility: Flows__, Water Quality **X**, Fish/Wildlife Resources **X**, Watersheds **X**, T/E Spp. __, Cultural/Historic Resources __Recreation __):	
Agency Name	Confederated Tribe of Siletz Indians of Oregon
Name and Title	Thomas Downey, Environmental Protection Specialist
Phone	(541) 444-8226
Email address	tomd@ctsi.nsn.us
Mailing Address	PO Box 549 Siletz, OR 97380

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources **X**, Recreation __):	
Agency Name	Confederated Tribes of the Grand Ronde Community of Oregon:
Name and Title	David Harrelson, Tribal Historic Preservation Officer
Phone	503.879.1630
Email address	david.harrelson@grandronde.org
Mailing Address	8720 Grand Ronde Road Grand Ronde, OR 97347-9712

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources **X**, Watersheds **X**, T/E Spp. __, Cultural/Historic Resources __ , Recreation __):	
Agency Name	Confederated Tribes of the Grand Ronde Community of Oregon:
Name and Title	Mike Karnosh, Environmental Resource Specialist
Phone	503 235-4230
Email address	michael.karnosh@grandronde.org
Mailing Address	4445 S.W. Barbur Blvd. Portland, OR 97239

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources **X**, Watersheds __, T/E Spp. **X**, Cultural/Historic Resources __, Recreation __):	
Agency Name	National Marine Fisheries Service
Name and Title	Stephanie Burchfield, Fishery Biologist
Phone	503-736-4720
Email address	Stephanie.Burchfield@Noaa.gov
Mailing Address	1201 NE Lloyd Blvd, Suite 1100 Portland OR 97232-1274

Agency Contact (Check area of responsibility: Flows **X**, Water Quality **X**, Fish/Wildlife Resources __, Watersheds **X**, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Department Of Environmental Quality
Name and Title	Karen Williams, Watershed Manager
Phone	503-229-6254
Email address	williams.karen@deq.state.or.us
Mailing Address	700 NE Multnomah St., Suite #600 Portland, OR 97232

Agency Contact (Check area of responsibility: Flows **X**, Water Quality __, Fish/Wildlife Resources **X**, Watersheds **X**, T/E Spp. , Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Department Of Fish And Wildlife
Name and Title	John Zauner, Hydropower Coordinator
Phone	971-673-6041
Email address	John.R.Zauner@state.or.us
Mailing Address	17330 SE Evelyn Street Clackamas, OR 97015

Agency Contact (Check area of responsibility: Flows **X**, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Water Resources Department
Name and Title	Mary Grainey, Hydroelectric Program Coordinator
Phone	503-986-0833
Email address	Mary.S.GRAINEY@state.or.us
Mailing Address	725 Summer Street NE, Suite A Salem, OR 97301-1271

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources **X**, Watersheds __, T/E Spp. **X**, Cultural/Historic Resources __, Recreation __):	
Agency Name	US Fish & Wildlife Service
Name and Title	Ann Gray, Program Manager
Phone	503-231-6179
Email address	ann_e_gray@fws.gov
Mailing Address	2600 S.E. 98th Ave., Suite 100 Portland, OR 97266

4.2 Non-governmental Contacts

Non-Governmental Stakeholder	Contact	Phone Number	Email Address	Mailing Address
Native Fish Society	Mark Sherwood *Executive Director*	503-496-0807	mark@nativefishsociety.org	221 Molalla Ave., Suite 100 Oregon City, OR 97045
Northwest Steelheaders	Bob Rees *Director*	503-653-4176	brees@pacifier.com	6641 SE Lake Rd, Milwaukie, OR 97222

5 Sworn Statement

Sworn Statement and Waiver Form

All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:

SWORN STATEMENT

As an Authorized Representative of Portland General Electric Comp., the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's Certification Program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The undersigned further acknowledges that if certification of the applying facility is issued, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified.

The undersigned Applicant further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's Certification Program.

PLEASE INSERT ONLY FOR PRE-OPERATIONAL CERTIFICATIONS (See Section 4.5.3)**:**

For applications for pre-operational certification of a "new" facility the applicant must also acknowledge that the Institute may suspend or revoke the certification should the impacts of the project, once operational, fail to comply with the certification criteria.

Lisa A. Kaner

Company Name: Portland General Electric Comp.

Authorize Representative Name: Lisa A. Kaner Title V.P. General Counsel and Corporate Compliance Officer

OFFICIAL STAMP
KAREN JEAN LEWIS
NOTARY PUBLIC-OREGON
COMMISSION NO. 932574
MY COMMISSION EXPIRES SEPTEMBER 23, 2018

State of Oregon)

County of Multnomah)

On this, the 16th day of February, 2018, before me a notary public, the undersigned officer, personally appeared Lisa A. Kaner, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same for the purposes therein contained. In witness hereof, I hereunto set my hand and official seal.

Notary Public Karen Jean Lewis
Karen Jean Lewis

Appendix A – Site Maps

Figure 4. Willamette Falls Watershed

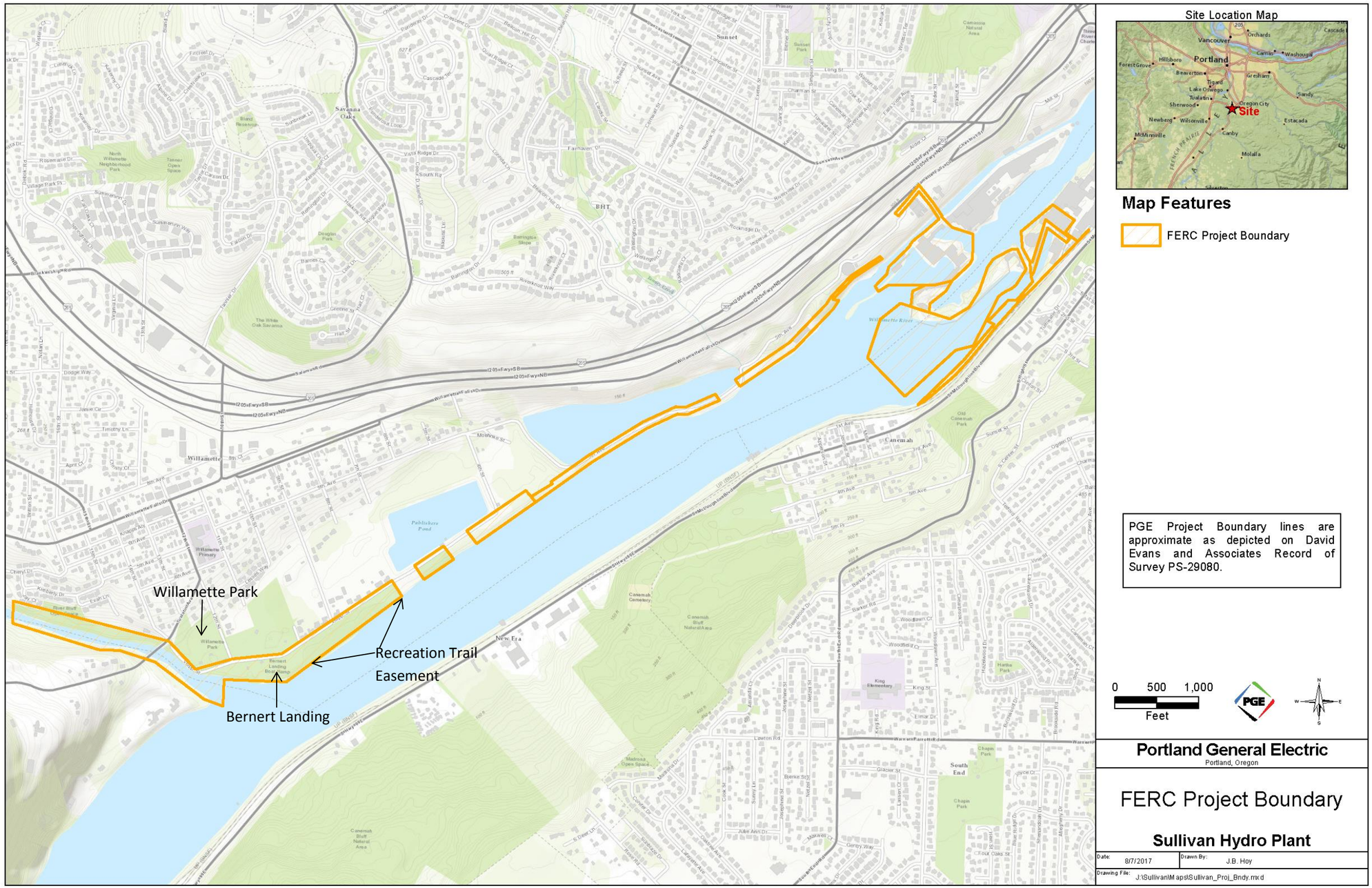

Figure 5. Willamette Falls FERC Project Boundary and recreation areas.

Appendix B – Project Photographs

Figure 6. TWS Powerhouse (looking west across river into tailrace area)

Figure 7. View of the Falls looking upstream during high flow conditions

Figure 8. Upstream end of ODFW Willamette Falls Fish Ladder

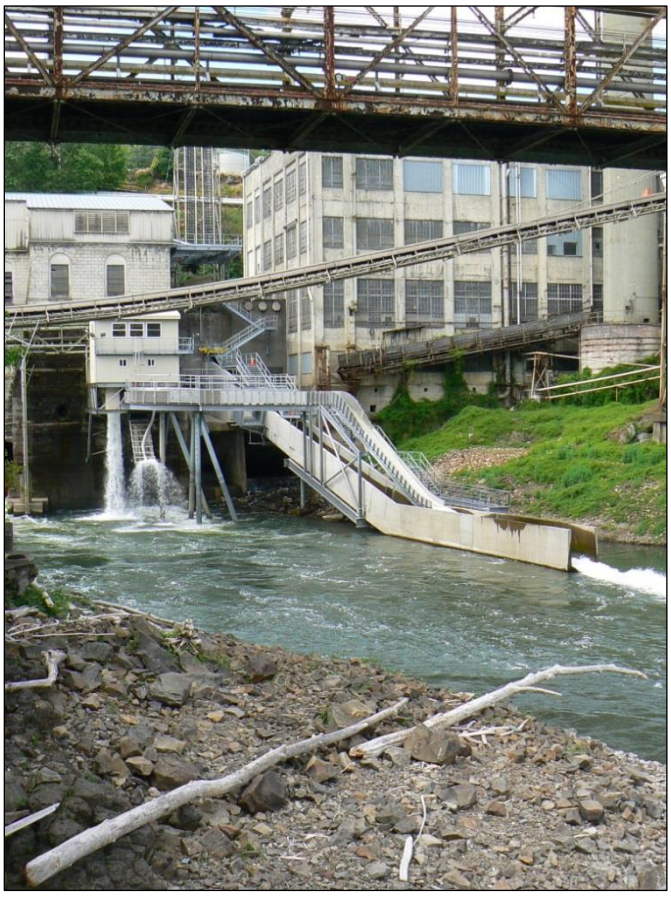

Figure 9. North Fish Bypass System tailrace outfall for downstream migrants

Figure 10. Flow Control Structure at apex of Falls. It consists of three inflatable bladder gates. Picture shows FCS in fully raised (closed) position.

Figure 11. Adult lamprey curb (looking upstream) on top of ODFW Fish Ladder (left). Lamprey exit gate (right).

Figure 12. Installation of lamprey passage ramp

Appendix C – Water Quality

From: WILLIAMS Karen
To: John Esler
Cc: MATZKE Andrea; Erica Amt
Subject: RE: LIHI re-Certification of the Willamette Falls project
Date: Wednesday, August 16, 2017 2:01:20 PM

Dear John,

Andre Matzke, Lower Willamette Basin Coordinator, and I are responding to PGE's request that DEQ determine that the Willamette Falls project does not cause or contribute to any of the water quality impairments classified as Category 4 or 5 in Oregon's 2012 Integrated Report. You have correctly identified such impairments in the table included with your July 27 e-mail attached below. To respond to your request, we relied on information in the 2004 Section 401 Certification Evaluation and Findings Report to assess the likely effects of project operations on identified water quality impairments in the Lower Willamette River. The report reviewed data, literature and modeling results to assess the project's effects on biocriteria, dissolved oxygen, nuisance phytoplankton, pH, sedimentation, temperature, total dissolved gas, toxic substances, and turbidity. In the case of each parameter, DEQ's evaluation provided reasonable assurance that project operations do not contribute to violations or impairments. DEQ concludes the 2004 assessment of potential water quality impacts from Willamette Project operations can be reasonably applied to assess current operations and that the Willamette Falls Project does not currently cause or contribute to water quality impairments.

Karen
Karen Font Williams
Basin Coordinator

DEQ Northwest Region
700 NE Multnomah St., Ste. 600 | Portland, OR 97232
(503) 229 - 6254 | fax (503) 229 - 6957
DEQ has a new website! Please update your bookmarks and check out the new site here: http://www.oregon.gov/deq/pages/index.aspx

---

From: John Esler [mailto:John.Esler@pgn.com]
Sent: Thursday, July 27, 2017 11:38 AM
To: WILLIAMS Karen
Cc: Erica Amt
Subject: LIHI re-Certification of the Willamette Falls project

Hi Karen,

PGE is working on an application to recertify the Willamette Falls Project as low-impact hydro by the Low Impact Hydro Institute (LIHI). Willamette Falls was initially certified in 2007 and recertified in 2012. One of the Water Quality Standard requirements is a determination that the Project is not the cause of any of the impairments on the of 303(d) list for the Willamette River. In 2008, Avis Newell commented on our application that the facility does not contribute to the 303(d) impairments listed

for waters in the project's vicinity. Avis was also contacted when we did our recertification in 2012 and raised no issues about our project contributing to the 303(d) impairments.

Below is a comparison of the parameters listed in the Oregon DEQ 2004/2006 Assessment Database and the Oregon DEQ 2012 Assessment Database. The 2004/2006 data was referenced in PGE's 2012 recertification application.

Parameter	2004/2006 River Mile	2012 River Mile
Aldrin	0-54.8	0-54.8
Biological Criteria	0-54.8	0-54.8
Chlordane	nl	0-24.8
Chlorophyll a	nl	0-54.8
Copper	nl	0-24.8
Cyanide	nl	0-24.8
DDT 4,4	0-54.8	0-54.8
DDE 4,4	0-54.8	0-54.8
Dieldrin	0-54.8	0-54.8
Dioxin (2,3,7,8-TCDD)	0-54.8	0-54.8
E. Coli	0-186.4	0-186.4
Fecal Coliform	0-54.8	nl
Hexachlorobenzene	nl	0-24.8
Iron	nl	0-24.8
Lead	nl	0-186.4
Manganese	0-24.8	nl
Mercury	0-54.8	0-186.6
Polychlorinated Biphenyls (PCBs)	0-54.8	0-54.8
Pentachlorophenol	0-24.8	0-24.8
Polynuclear Aromatic Hydrocarbons	0-24.8	0-24.8
Temperature	0-50.6	0-50.6

nl = not listed on the 303(d) list

Would you please confirm in an email back to me that the Willamette Falls Project continues to <u>not</u> contribute to the 303(d) impairments listed for waters in the Project's vicinity? Please let me know if you have any questions related to this request.

Thanks,
JE

John Esler
Project Manager - Environmental Compliance & Licensing

Portland General Electric
121 SW Salmon St (3-WTC-0403)
Portland OR 97204
503-464-8563 (w)
503-705-1786 (c)
John.Esler@PGN.COM