

Willamette Falls (LIHI # 33) Recertification Review Report



Introduction and Overview

This report reviews the application submitted by Portland General Electric (applicant) to the Low Impact Hydropower Institute (LIHI) for LIHI recertification for the Willamette Falls Hydroelectric Project (Facility) located on the Willamette River in Clackamas County, Oregon. The Federal Energy Regulatory Commission (FERC) relicensed the project (FERC 2233) in 2005 for the operation and maintenance of the 15.18 megawatt run-of-river project. This application review for recertification was conducted using the new, 2nd Edition Handbook that was published in March 2016.

Background:

The project is located at river mile 26.5 on the Willamette River within the city limits of Oregon City (to the east) and West Linn (to the west) in north-central Oregon, approximately 10 miles from Portland and 40 miles from the Willamette's confluence with the Columbia River. The project is located in a populated, industrial urban setting at the site of Willamette Falls, a natural waterfall that marks the head of the tidally influenced lower Willamette River. The applicant has operated hydroelectric facilities at the site since 1889. 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. 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.



Figure 1 – Willamette Falls Regional Area

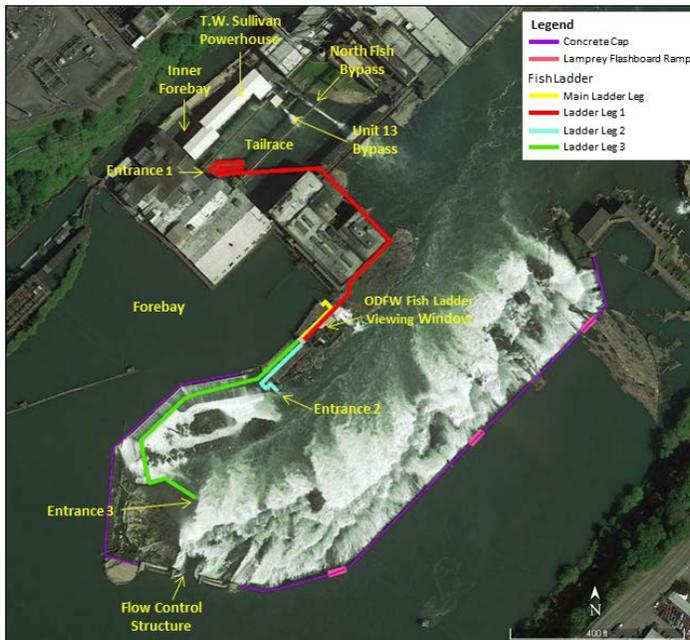


Figure 2 – Willamette Falls Powerhouse

Recertification Standards

On May 8th, 2017, LIHI notified the applicant of upcoming expiration of the Low Impact Hydropower Institute certification for the Willamette Falls Hydroelectric Facility on November 2, 2017. The letter included an explanation of procedures to apply for an additional term of certification under the 2nd Edition LIHI Handbook, including the new two-phase process starting with a limited review of a completed LIHI application, focused on three questions:

- (1) Is there any missing information from the application?
- (2) Has there been a material change at the certified facility since the previous certificate term?
- (3) Has there been a change in LIHI criteria since the certificate was issued?

If the answer to any question is “Yes,” the Application must proceed through a second phase, which consists of a more thorough review of the application using the LIHI criteria in effect at the time of the recertification application. The letter noted that “because the new Handbook involves new criteria and a new process, the answer to question two for all projects scheduled to renew in 2016 and beyond will be an automatic ‘YES.’” Therefore, all certificates applying for renewal post 2016 will be required to proceed through both phase one and phase two of the recertification application reviews.” Two extensions of the certification term were issued, extending the current certificate to June 30, 2018. The Phase I Review was completed on November 30, 2017, noting minor deficiencies and areas to resolve in an updated Phase II Application which was submitted to LIHI on February 21, 2018. Since the original application needed very little additional information, the public comment period was initiated September 26, 2017 and ended November 25, 2017 with no comments on the application being received by LIHI. This report comprises the final Phase II review.

Adequacy of the Recertification Package

On February 21, 2018, the Applicant provided supplemental information based on the minor deficiencies identified during the Phase I Review. My recertification review included the application package, supporting comments and documentation from LIHI obtained during compliance reviews and public records on FERC e-library since the most recent LIHI recertification (10/22/2012). Personal communication (email/phone) outreach was made to National Marine Fisheries (NMFS) Service, Oregon Department of Fish and Wildlife (ODFW), and Oregon Department of Environmental Quality (ODEQ). Response was provided by ODFW at the time of this report. The ODEQ contact Karen Williams, referred me to another ODEQ representative (Steve Mrazik), as she has changed positions. Ms. Williams did provide a letter of 303d compliance support in the Application. Therefore, the absence of ODEQ concurrence on the pending LIHI certification is not considered a gap in the recommendation. The absence of the NMFS concurrence is also not considered a gap, as the Applicant has demonstrated compliance with a Biological Opinion, and the FERC record review did not include any correspondence to the contrary. See Appendix A for personal communication evidence. The application was public noticed and received no public comments during the comment period. The materials provided and referenced above are sufficient to make a recertification recommendation. This recommendation is based on the Applicant demonstrating the following statements are accurate:

1) Is there any missing information from the application?

The original application information was basically complete. Minor clarifications and additional information were requested as part of the Stage 2 review. That information is included in the final application posted on the LIHI website and discussed below.

2) Have there have been material changes in the project design or operation, in the affected environment, or in compliance with the current LIHI Certification or with LIHI conditions since the last certification?

In accordance with the Recertification Standards, "material changes" mean non-compliance and/or new or renewed issues of concern that are relevant to LIHI's criteria. Based on my review of materials provided, review of FERC's public records, and consultation with the noted individuals, I found that there are no areas of noncompliance or new or renewed issues of concern. The previous LIHI certificate has no conditions attached.

3) Where the LIHI certification criteria satisfied in all zones?

The Applicant properly selected 2 Zones of Effect, Project and Impoundment for the Willamette Hydroelectric Facility.

Project Zone of Effect

In the Project Zone of Effect (ZOE) Standard 1 "Not Applicable/De Minimis Effect" was appropriately applied for Criteria A (flows), E (shoreline protection), and H (recreation). The Applicant provided sufficient evidence to support the Standard 1 as there is no active storage at the project which functions as a run of river project, the project has no bypassed reach, and no upstream shoreline influence or recreation commitments. Any flow not captured for hydropower production goes over the falls.

In the Project ZOE, Standard 2 "Agency Recommendations" was accurately selected for Criterion B (water quality), C (upstream fish passage), D (downstream fish passage), F (protected species) and G (cultural

resources). No additional agency requirements have occurred since the prior LIHI Certification. The Applicant has satisfied each of these Criterion as shown below.

Criterion B: Water Quality

The Project demonstrated compliance with the ODEQ issued 401 Certificate in 2004 which in itself is not sufficient to meet Criterion B under the LIHI 2nd Edition Handbook; however, agency correspondence was included in the application that stated that the Project does not contribute to the 303(d) impairments for waters in the Project's vicinity.

Criterion C: Upstream Fish Passage

Upstream passage for salmonids is provided by an ODFW fish ladder that was renovated in 1997. The ladder is not a project feature and is not included in the FERC license terms and conditions. The Project also is beholden to a multi-party Settlement Agreement which requires the Applicant to fund the operation and maintenance of both the ladder and the associated fish counting station¹. The Applicant is responsible for providing labor and materials for the ladder to ensure it remains an effective passage. The Applicant is also obligated to provide passage for Pacific lamprey. The Applicant has constructed improvements to the ODFW ladder for passage. The Applicant, through the development of the Adult Pacific Lamprey Passage Plan, 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.

Criterion D: Downstream Passage

The Applicant 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 North Fish Bypass (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, 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. The FERC record review did not demonstrate any compliance issues for this Criterion.

Criterion F: Threatened and Protected Species

Three protective species: Chinook salmon, Steelhead and Coho salmon occur at the Project. 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 Upper Willamette River (UWR) Chinook salmon, UWR steelhead, Lower Columbia River (LCR) Chinook salmon, LCR steelhead, and (through a conference opinion) LCR Coho salmon. 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

¹ 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.

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. 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.” The FERC record review did not identify any correspondence contrary to these assertions.

Criterion G: Cultural and Historic Resources Protection

The Applicant has successfully implemented the FERC required Historic Properties Management Plan (HPMP). In addition, the Applicant developed a Manual for Built Resources (MBR) in consultation with the State Historic Preservation Office (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 Project area. The MBR is the first such treatise created for any hydroelectric project in the State and now serves as a model document that the SHPO requires other hydroelectric plants to adopt. The FERC record review supported the assertions of compliance from the Applicant. All annual reports were submitted, and no outstanding issues were identified in this review.

In the Project ZOE the Applicant selected the PLUS Standard for Criterion D-Downstream Fish Passage and for Criterion G-Cultural and Historic Resource Protection. The Applicant has satisfied the PLUS Standard in both of these Criteria as demonstrated below.

Criterion D PLUS: Downstream Fish Passage

The standard downstream fish passage method involves installing screens or trash racks with small spacing on turbine intakes to prevent fish from being drawn into the turbines, along with provision for an alternative route such as a downstream fish bypass pipe, or spill gate.

In collaboration with stakeholders, the Applicant designed and implemented numerous site-specific forebay modifications that collectively create flow conditions that allow natural migratory behaviors to guide migrating fish safely through the Project.

This innovative solution involved several significant physical modifications including changes to the inner forebay and trash racks to improve the hydraulics and constructing a high-flow bypass (the North Fish Bypass or NFB). Forebay hydraulics were modeled and physical changes made to the guide wall to create sweeping flows perpendicular to the turbine intakes so downstream migrating fish can safely move past the 12 unscreened turbines towards two bypass routes - the Unit 13 Eicher Screen or the NFB, both of which provide a safe route to the tailrace. In addition, the trash racks on Unit 13 were modified nearly eliminating fish impingement, and the unscreened Blue Heron Powerhouse was permanently shut down. Fish passage performance was tested using a host of methodologies and demonstrated that less than 1% of the downstream migrating fish were entrained 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 license-mandated 98% passage success criterion.

This comprehensive approach meets the PLUS standard as it demonstrates innovation by the Applicant over the standard solution for downstream passage protection which likely would not have resulted in such high passage and survival rates.

Criterion G PLUS-Cultural and Historical Resources Protection

The Applicant has satisfied the PLUS Standard by protecting a significant historical resource that is not a requirement of their FERC license. The Applicant identified a historic site along the basalt outcroppings of the Locks and Navigation canal on the west shore. This site has a World War II engraving on the rocks with the words, “Buy War Bonds”. PGE worked with the property owners (the US Army Corps of Engineers) to clear brush, expose the engraving, prepare an archaeological site form, and document it with the SHPO which subsequently listed it as a historic site.

Impoundment Zone of Effect

In the Impoundment ZOE, Standard 1 “Not Applicable/De Minimis Effect” was appropriately applied for all criteria except Criterion H. The Applicant provided satisfactory evidence that Standard 1 was met for the ZOE Impoundment for Criterion A-G, through the information provided in the Project ZOE, or due to the fact that the Project does not physically impound water to any measurable effect. The presence of the natural falls and river geology serves to create the minimal impounding conditions. Willamette River flow is not impeded by the Project. The Project simply captures river flow through a forebay before it naturally goes over the falls. ODEQ issued a letter supporting the Project, demonstrating that the Project does not alter water quality above, around, or below the Project. Fish passage criteria were captured in the Project ZOE.

For Criterion H-Recreational Resources, Standard 2 “Agency Recommendation”, was appropriately applied. The Applicant provided satisfactory evidence of meeting their FERC License obligations under Article 410, requiring 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 also leased land to the City of West Linn for two parks located within and adjacent to the Project boundary. PGE does not charge any fees for access to the Willamette River through facilities located within the Project boundary.

Conclusion

The materials provided and referenced above are sufficient to make a recertification recommendation, and no further application review is needed. In conclusion, the Recertification of the Willamette Falls Hydroelectric Facility to a new, ten-year term, with no conditions required is recommended. The ten-year term includes the two PLUS term extensions totaling the additional five years of recommended certification.

Please contact me if you have any questions.

Sincerely,



Diane M. Barr, Principal
Camas, LLC

Attachment A

State and Federal Agency Communication for LIHI Concurrence for Certification

Subject: RE: Willamette Falls LIHI Re-Certification
Date: Monday, March 26, 2018 at 4:04:26 PM Pacific Daylight Time
From: John Zauner
To: Diane Barr
Attachments: image002.png

Diane,

ODFW supports the recertification of Portland General Electric's Willamette Falls facility. There are no unresolved issues as PGE continues to fulfill their settlement obligations to benefit the resource, including providing fish access to habitat necessary for successful life cycle completion.

Regards,

John Zauner
NW Hydropower Coordinator
Oregon Department of Fish and Wildlife
17330 SE Evelyn Street
Clackamas, Oregon 97015

From: Diane Barr [mailto:diane@camasllc.com]
Sent: Thursday, March 22, 2018 5:19 PM
To: john.r.zauner@state.or.us
Subject: Willamette Falls LIHI Re-Certification
Importance: High

Hi John,

I am assisting Low Impact Hydroelectric Institute with recertification reviews for the Willamette Falls PGE facility. As part of their recertification, it is my role and responsibility to reach out the agencies for any potential unresolved issues. Specifically, in your agency's view, does the facility contribute adversely to the sustainability of local fish populations or to their access to habitat necessary for successful completion of their life cycle?

Thank you for your time.

Regards,

Diane M. Barr
Principal
541.261.4886



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Subject: Re: Willamette Falls LIHI Re-Certification, ODEQ
Date: Tuesday, March 27, 2018 at 9:07:31 AM Pacific Daylight Time
From: Diane Barr
To: WILLIAMS Karen
CC: Maryalice Fischer
Attachments: image001.png, image002.png

Thanks Karen, I will reach out to Steve. I hope the new position is working out well.

Regards!

Diane M. Barr
Principal
541.261.4886



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From: WILLIAMS Karen <Karen.WILLIAMS@state.or.us>
Date: Tuesday, March 27, 2018 at 8:48 AM
To: 'Diane Barr' <diane@camasllc.com>
Subject: RE: Willamette Falls LIHI Re-Certification

Hello, Diane. I am no longer in the position at Northwest Region DEQ that reviews PGE's Hydro operations. My former manager, Steve Mrazik, can be contacted below and can assign this request to the most appropriate person until my former position is filled. Thanks for your patience.

Steve Mrazik, Northwest Region Water Quality, Watersheds and 401 Manager
Mrazik.steve@deq.state.or.us
(503) 229 – 5379

Karen Font Williams | Air Quality Planner
DEQ Environmental Solutions Division
700 NE Multnomah St., Ste. 600 | Portland, OR 97232
(503) 229 - 5519

From: Diane Barr <diane@camasllc.com>
Sent: Thursday, March 22, 2018 5:17 PM
To: WILLIAMS Karen <WILLIAMS.Karen@deq.state.or.us>
Subject: Willamette Falls LIHI Re-Certification
Importance: High

Hi Karen,

I am assisting Low Impact Hydroelectric Institute with recertification reviews for the Willamette Falls PGE facility. As part of their recertification, it is my role and responsibility to reach out the agencies for any

potential unresolved issues. Specifically, in your agency's view, does the facility contribute adversely to the water quality conditions above or below the project due to its operations since the last certification date of 2012?

Thank you for your time.

Regards,

Diane M. Barr
Principal
541.261.4886



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Subject: FW: Willamette Falls LIHI Re-Certification
Date: Tuesday, March 27, 2018 at 9:19:15 AM Pacific Daylight Time
From: Diane Barr
To: Mrazik.steve@deq.state.or.us
Attachments: PGE 2017 WF LIHI_ODEQ Support Email.pdf, image001.png, image002.png

Hi Steve, I am an independent reviewer of Low Impact Hydro Certification applications. As part of that process, we like to reach out to the regulators to confirm the Applicants depiction of compliance. The Willamette Falls Application included a supportive email from ODEQ, Karen Williams. See attached. I had reached out to Karen, and she let me know that she is no longer in that position, and referred me to you.

This outreach is not requesting a formal response from ODEQ. It is simply to verify that the ODEQ does not have undocumented or unresolved issues that could influence our decision on certifying the project under LIHI.

Please feel free to email me back or call me with any concerns you may have with us certifying the project under the LIHI criteria.

Regards,

Diane M. Barr
Principal
541.261.4886



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From: WILLIAMS Karen <Karen.WILLIAMS@state.or.us>
Date: Tuesday, March 27, 2018 at 8:48 AM
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Subject: RE: Willamette Falls LIHI Re-Certification

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Steve Mrazik, Northwest Region Water Quality, Watersheds and 401 Manager
Mrazik.steve@deq.state.or.us
(503) 229 – 5379

Karen Font Williams | Air Quality Planner
DEQ Environmental Solutions Division
700 NE Multnomah St., Ste. 600 | Portland, OR 97232
(503) 229 - 5519

From: Diane Barr <diane@camasllc.com>
Sent: Thursday, March 22, 2018 5:17 PM
To: WILLIAMS Karen <WILLIAMS.Karen@deq.state.or.us>
Subject: Willamette Falls LIHI Re-Certification
Importance: High

Hi Karen,

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Thank you for your time.

Regards,

Diane M. Barr
Principal
541.261.4886



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Subject: Willamette Falls LIHI Certification
Date: Thursday, March 22, 2018 at 5:14:37 PM Pacific Daylight Time
From: Diane Barr
To: Stephanie.burchfield@noaa.gov
Attachments: image001.png

Hi Stephanie,

I am assisting Low Impact Hydroelectric Institute with recertification reviews for the Willamette Falls PGE facility. As part of their recertification, it is my role and responsibility to reach out the agencies for any potential unresolved issues. Specifically, in your agency's view, does the facility contribute adversely to the sustainability of local fish populations or to their access to habitat necessary for successful completion of their life cycle?

(On another note...HI!!! I hope all is well. It has been a very long time since we have interacted)

A response to this question it would be most helpful.

Cheers!

Diane M. Barr
Principal
541.261.4886



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