

# GABRIELA GOLDFARB CONSULTING

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January 20, 2011

Fred Ayer, Executive Director  
Low Impact Hydropower Institute  
34 Providence St.  
Portland, ME 04103

Subject: REVISED Final Application Reviewer Report for the North Umpqua Hydroelectric Project

Dear Fred:

Attached please find my revised final reviewer's report on the application by PacifiCorp for certification of the North Umpqua Hydroelectric Project by the Low Impact Hydropower Institute. The principal change is a modification to the explanation of my recommendation to the LIHI Governing Board; there has been no change to the substance of the report. Please contact me with any questions or concerns about the attached report.

Best regards,

s//Gabriela

Gabriela Goldfarb

Attachment: as described.

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## **Review of Low Impact Hydropower Institute Application for Low Impact Hydropower Certification: North Umpqua Hydroelectric Project**

### **Introduction**

This report reviews the application submitted by Pacificorp (applicant) to the Low Impact Hydropower Institute (LIHI) for Low Impact Hydropower Certification for the North Umpqua Hydroelectric Project (project or facility) located on the North Umpqua River and two of its tributaries: Fish Creek and Clearwater River in Douglas County, OR. The Federal Energy Regulatory Commission (FERC) relicensed this peaking project (FERC #1927) in 2003, issuing a 35-year license for the operation and maintenance of the 185.5 megawatt project and incorporating the provisions of a 2001 settlement agreement. However, under the provisions of the settlement agreement, the license would not be finalized until all administrative and judicial appeals were exhausted. Nongovernmental organizations (NGOs) appealed the license to the Ninth U.S. Circuit Court of Appeals in 2004. The court ruled against the NGOs, and the license became final October 18, 2005.

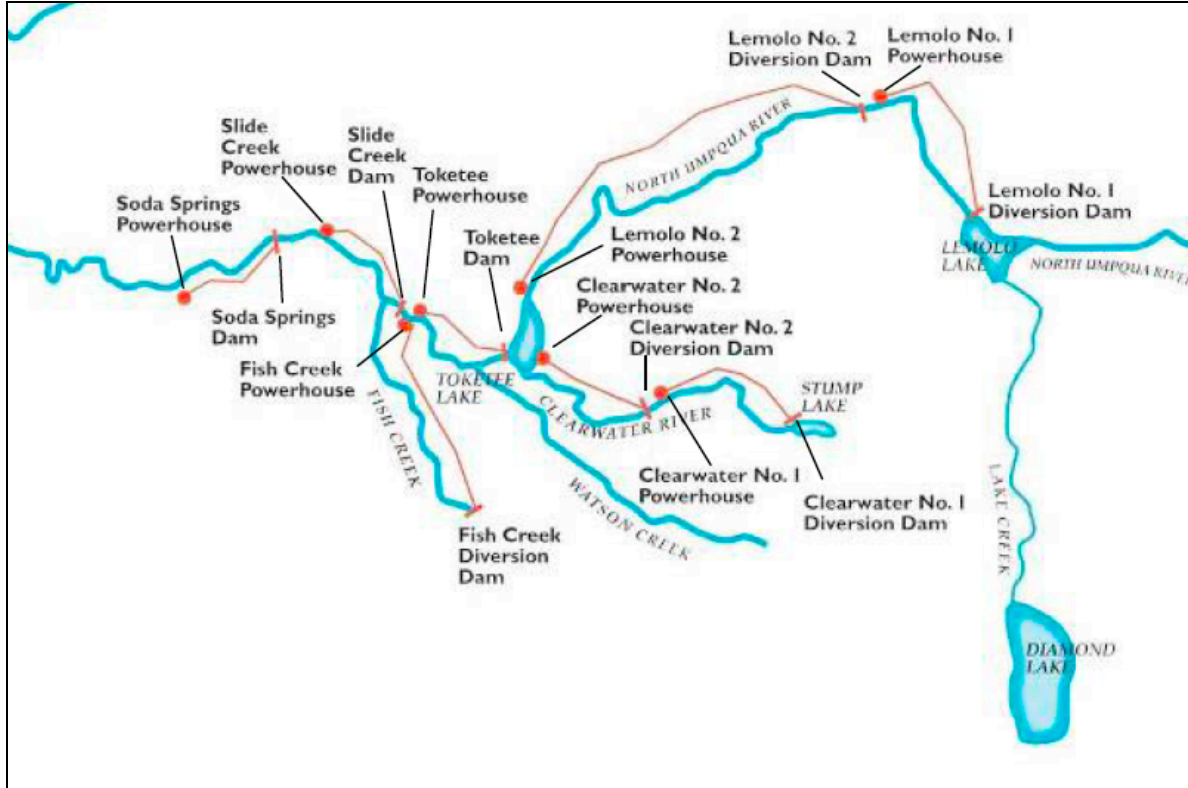
### **Project and Site Characteristics**

The project is located in south-central Oregon on the west side of the Cascade mountain range, and primarily occupies lands administered by the U.S. Forest Service (USFS); small portions of the project are on U.S. Department of the Interior Bureau of Land Management (BLM) and private property. The headwaters of the North Umpqua River are located at an elevation of over 6,000 feet on the western slope of the High Cascade Mountain Range near Maidu Lake. Approximately 20% of the North Umpqua River watershed lies above 5,600 feet and the river drains about 470 square miles before joining the South Umpqua River west of the city of Roseburg. Both the North and South Umpqua Rivers have a rugged topography with steep canyons and rapid elevation changes. The drainages of the North and South Umpqua Rivers together make up roughly two-thirds of the greater basin drainage, and each river is about 105 miles long. The mainstem Umpqua River flows in a northwesterly direction another 112 miles to the ocean. Together, the three rivers form one of the longest coastal basins in Oregon, approximately 211 miles in length, with a drainage area of over 4,700 square miles. In 1988 the United States Congress designated approximately 33 miles of the North Umpqua River immediately below the project as part of the National Wild and Scenic River program.

The project was constructed between 1947 and 1956 and consists of eight developments, each with a dam, penstock, and powerhouse, and each with water conveyances (canals, flumes, pipes, and/or tunnels) carrying water from the dam site to a downstream powerhouse, such that every development includes a bypass reach. The developments are depicted in the map below and described in more detail in Attachment A. The project includes three reservoirs (Lemolo No. 1, Toketee, and Soda Springs), an impoundment at Stump Lake, four forebays (Lemolo No. 2, Clearwater Nos. 1 and 2, and Fish Creek), 31.3 miles of canals and flumes, and 5.8 miles of penstock and tunnels (total waterway

length of more than 37 miles), 117.5 miles of transmission lines, and 100 miles of project-related roads. Soda Springs, the lowermost dam, is at North Umpqua river mile (RM) 69.8; the uppermost dam, Lemolo 1, is at RM 93.

### Map of the North Umpqua Hydroelectric Project



Source: *Pacificorp Application for LIHI Certification*

## Regulatory and Legal Background

Settlement agreement negotiations. Beginning in the early 1990s, in advance of the 1997 expiration of the project's original 1946 license, the applicant initiated preparation of a relicensing application with FERC and settlement agreement negotiations with a range of resource agencies and NGOs. (The project operated under a series of license extensions until final relicensing.) According to an NGO participant, the applicant terminated the negotiations in 1999, primarily over the recommendation by the USFS and NGOs that Soda Springs dam (the lowest-most development) be removed to open fish habitat and passage. USFS did not file the removal recommendation as a Federal Power Act Section 4(e) condition. In 2000 Pacificorp reconvened the negotiations. At that point the USFS no longer recommended Soda Springs dam removal, recommending instead a form of fish passage at Soda Springs. The NGOs participated for a time in the reconvened negotiations, but withdrew over dissatisfaction with the emerging proposals about Soda Springs, and other issues including flow regimes and terrestrial wildlife passage needs across the project's water conveyances. (The content of the negotiations are confidential, so additional details are not available.)

Settlement agreement signatories and provisions. In June 2001, the relicensing process culminated in the development and signing of the North Umpqua Hydroelectric Project Settlement Agreement. The agreement was signed by the applicant and the following federal and state agencies:

- USFS
- National Marine Fisheries Service (NOAA Fisheries)
- USDI Fish and Wildlife Service (FWS)
- USDI Bureau of Land Management (BLM)
- Oregon Department of Environmental Quality (ODEQ)
- Oregon Department of Fish and Wildlife (ODFW)
- Oregon Water Resources Department (OWRD)

The settlement agreement included “date certain” pre- and post-license measures to be completed by a specific date regardless of when the final license was issued; “license-dependent” measures to be implemented post-final licensing; and “early implementation” measures to be conducted prior to final licensing, funded by the applicant through an “Early Implementation Fund.” The measures focus principally on fluvial geomorphic processes, aquatic and riparian habitat connectivity, instream flows, reservoir and forebay management, water quality, anadromous fish passage and off-site mitigation, terrestrial species connectivity, and wildlife entrapment, but also address watershed protection, habitat creation and restoration, recreation, cultural resource protection, and a range of other issues.

The settlement agreement also established a Resource Coordination Committee (RCC) including all the signatories to the settlement agreement that meets regularly to oversee implementation of settlement agreement, FERC license, and Clean Water Act Section 401 Water Quality Certification (401 WQC) requirements.

Clean Water Act Sec. 401 Certification. The 401 WQC incorporates all of the settlement agreement provisions, and adds a number of additional requirements. These include, for example, the development of management, monitoring, and/or reporting plans relating to water temperature, total dissolved gas, oil/chemical spill prevention, dissolved oxygen, pH, chlorophyll-a, turbidity, and total dissolved solids. ODEQ also required advance agency approval of actions that could affect water quality and flows, the use of maintenance events to enhance fluvial geomorphology processes and the distribution of large wood and gravel, and authority to reopen the 401 WQC under a broad array of circumstances (TMDL approvals, changes to the project or water body designations, failure of prescribed measures to achieve intended results, etc.).

Legal challenge. In May 2004 Earthjustice filed on behalf of Umpqua Valley Audubon Society, Umpqua Watersheds, The North Umpqua Foundation, Steamboaters, Oregon Natural Resources Council, Pacific Rivers Council, and American Rivers (“the environmental groups”) a petition for review by the Ninth Circuit Court of Appeals of the decisions of both FERC and the USFS relating to the issuance of the project’s new 35-year operating license. Under Federal Power Act Section 4(e) the USFS had the authority

to file terms and conditions to protect the Forest Service lands on which the project is located. An Earthjustice press release described the legal action as follows: “According to the lawsuit filed by Earthjustice, the Forest Service ignored the advice of its own scientists when it agreed to the issuance of a new operating license for the project without requiring adequate measures to protect wildlife and their habitat.”<sup>1</sup> The principal motivation behind the lawsuit was to oppose the USFS decision to approve the license without the removal of Soda Springs dam; this approval represented a reversal of the position taken by USFS scientists in the first phase of settlement negotiations (but never memorialized in 4(e) conditions) that the dam should be removed.

The lawsuit specifically challenged the following:

1. The USFS decision no longer to issue a Record of Decision for conditions it provides pursuant to Federal Power Act § 4(e);
2. The USFS decision not to prepare an environmental impact statement; and
3. The substance of USFS’ 4(e) conditions submitted to FERC for inclusion in the license.<sup>2</sup>

According to the lawsuit, the USFS action deprived the public of opportunities to make its voice heard and represented a reversal of its position without explanation and without a scientific justification. In a September 2005 decision the court upheld the USFS’ policy decisions in each instance.

### **Public Comment and Agency Letters**

LIHI received the following comment letters on this project (available at the [LIHI website](#)):

1. U.S. Fish and Wildlife Service (FWS; dated 2/4/2010)
2. American Rivers, Native Fish Society, Pacific Rivers Council, and the Steamboaters (submitted 2/8/2010)
3. Kelly Crispen, University of Montana and Umpqua Nation Cow Creek Band, and Jack Stanford, University of Montana (submitted 2/8/2010)
4. Cindy Haws, Umpqua Watersheds (submitted 2/8/2010)
5. Doug Heiken, Oregon Wild (submitted 2/9/2010)

This reviewer contacted all commenters in November 2010 via email to inquire whether any wanted to update their comments; of those who responded (submitters of letters 1, 2, and 4), none wanted to add anything to their earlier comments.

The relevant paragraph of the FWS letter stating the agency’s position regarding LIHI certification of the North Umpqua project reads as follows:

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<sup>1</sup> The Earthjustice press release is available at [earthjustice.org/news/press/2004/north-umpqua-hydropower-license-illegal](http://earthjustice.org/news/press/2004/north-umpqua-hydropower-license-illegal).

<sup>2</sup> Umpqua Valley Audubon Society et al. v. FERC. No. 04-72600 (9th Cir. September 1, 2005). Available at [www.ca9.uscourts.gov/coa/memdispo.nsf/pdfview/090105/\\$File/04-72600.PDF](http://www.ca9.uscourts.gov/coa/memdispo.nsf/pdfview/090105/$File/04-72600.PDF).

*Presently anadromous and listed fish species cannot pass Soda Springs dam. Though PacifiCorp is diligently implementing the terms and conditions of the settlement agreement, several important elements are not in place including the fish ladder and juvenile return system at Soda Springs dam, the Slide Creek tailrace barrier, and the Lemolo II re-route. Several years of construction and effectiveness monitoring lie ahead before we can ascertain that impacts to fish species have been ameliorated. Therefore, we suggest that this certification not be issued until the successful implementation of these facilities and subsequent monitoring has documented success.*

The remaining letters made a number of points in arguing that LIHI should not consider the project to be low impact, including the following main points:

- The final settlement agreement lacks legitimacy because it was ultimately negotiated and signed without participation by environmental organizations.
- The breadth of the project, spanning eight developments causing extensive alteration of the upper North Umpqua basin, should not be considered low impact.
- The mitigation measures required under the project's license do not adequately compensate for the project's impacts to fish and wildlife resources.
- The mitigation measures are not consistent with the policy direction of the Northwest Forest Plan.
- The single greatest objection to the project is the failure to remove Soda Springs dam, the lowermost project, because of the inadequacy of the settlement agreement's provision of artificial fish passage at Soda Springs dam compared with dam removal benefits.

Illustrative excerpts from these letters include the following:

*"In sum, the project should not be certified because even if it complies with the terms of the governing settlement agreement, the adverse impacts of Soda Springs dam and its reservoir will remain ecologically significant."*

- American Rivers, Native Fish Society, Pacific Rivers Council, and the Steamboaters

*"In summary, the negative impacts to native wild salmonids, including the Coastal Coho Salmon which is listed as threatened under the Endangered Species Act and Pacific lamprey as a result of Soda Springs Dam disqualify the entire North Umpqua Hydroelectric project from being certified as a low impact hydroelectric project."*

- Kelly Crispen, University of Montana and Umpqua Nation Cow Creek Band, and Jack Stanford, University of Montana

*"Specifically, this project should not be considered potentially certifiable as "low impact" without 1) Converting all of the extensive open canals and flumes to buried pipe and 2) The removal of Soda Springs Dam. As these have severe limitations on ecosystem function."*

- Cindy Haws, Umpqua Watersheds

*”Even if Soda Springs was not an issue, this complex hydro project is far from benign. There are 8 diversions/ impoundments and many miles of mid-slope canals and pipelines that block or intercept tributaries and and fragment both terrestrial and aquatic habitat in the watershed. This is a problem for wildlife large and small, not to mention the hydrologic impairment of the watershed. We should not play favorites with species and focus on anadromous fish when many other species of wildlife and non-anadromous fish are detrimentally affected by this project.”*

– Doug Heiken, Oregon Wild

### **Note Regarding Resource Agency Consultations for this Review**

In addition to reviewing letters and the documentary record to obtain the views of the relevant resource agencies, this reviewer spoke with representatives of FWS, USFS, BLM, ODFW, ODEQ, and OWRD. The NOAA Fisheries representative to the RCC refused an interview request, saying “it is the policy of our office not to comment on these types of actions.” His supervisor did not respond to follow up inquiries. In any case, the remaining resource agency staff were unanimous in praising the applicant for acting expeditiously, collaboratively, and in good faith to comply with the letter and spirit of its resource protection, mitigation, and enhancement requirements. At the same time, those most focused on fish and wildlife and water quality issues cautioned that many important measures are yet to be implemented and tested.

### **General Conclusions**

In my review of this project the only concern raised by resource agency staff (specifically FWS and ODFW staff) was that awarding LIHI certification was premature because a number of significant fish passage- and water quality-related measures had not yet been implemented and monitored for effectiveness. This review found that across all the LIHI criteria, with one exception, this project meets all LIHI criteria.

The exception noted above is that the project has been deemed a source of impairment to a Clean Water Act Section 303(d)-listed water body. Waters in the vicinity of the Lemolo 2 development are listed as impaired for pH. However, as described in more detail in section B.2 below, the resource agencies accorded higher priority to resolution of a sweeping array of other water quality problems in crafting the 401 WQC. Furthermore, the applicant has already implemented measures (for its own operational reasons) that may have resolved the likely source of the pH exceedance that prompted the 303(d) listing.

Under the current approved schedule of implementation of improvement measures at the site, the earliest opportunity to conduct the required monitoring to know definitively whether the pH issue has been addressed would have been Spring 2012. However, because this issue was highlighted by the LIHI review of this project, the ODEQ staff has issued a letter offering the applicant the option to develop a monitoring plan in consultation with the agency that would generate information needed to determine

whether the project is still a contributor to the existing 303(d) listing on a more rapid timeline than currently contemplated by the 401 WQC (see discussion below of the LIHI water quality criterion and a copy of the ODEQ letter included as Attachment B to this report).

A second water quality issue highlighted in the course of this LIHI review is an ODEQ requirement that the applicant resample for dissolved oxygen in the Soda Springs bypass reach after construction of the Soda Springs fish ladder. As discussed in more detail under the water quality criterion below, ODEQ issued the requirement because of a discrepancy between field audit data and continuous monitoring gauge data.

### **Recommendation**

Based on my review of information submitted by the applicant, my review of additional documentation, and my consultations with resource agency staff, I believe the North Umpqua Hydroelectric Project meets LIHI criteria and is eligible to be certified if the Governing Board, following past practice, conditionally certifies the project. If the Governing Board chooses to take this route, the conditions the LIHI Governing Board may wish to adopt is as follows:

1. The applicant shall implement an ODEQ-directed timetable to characterize pH in the tailrace discharge of the Lemolo 2 powerhouse within one year of LIHI certification. Upon completion of that monitoring, the applicant shall obtain and provide to LIHI a letter from ODEQ that states whether the reach in question complies with state water quality standards for pH. In the event that the ODEQ finds the project continues to be a contributor to the 303(d)-listed impairment for pH in the vicinity of the project, LIHI reserves the right to suspend or revoke certification.
2. The applicant shall implement ODEQ-directed resampling for dissolved oxygen in the Soda Springs bypass reach after the completion of the Soda Springs fish passage construction. The applicant shall obtain and provide to LIHI a letter from ODEQ that states whether the reach in question complies with state water quality standards for dissolved oxygen. In the event that the ODEQ finds the project to be a contributor to dissolved oxygen impairment in the subject reach, LIHI reserves the right to suspend or revoke certification.

In the alternative, a strict reading of the LIHI criteria that does not allow for conditional certification would result in a recommendation to deny certification based on the fact that the project is presently deemed to be a contributor to a 303(d) listed water quality impairment.



## Low Impact Certification Criteria

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### A. Flows

- 1) Is the Facility in Compliance with Resource Agency Recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?**

**YES**

Consistent with its license requirements, the applicant is implementing a Flow Monitoring Plan (as amended) approved by resource agencies (USFWS, NOAA Fisheries, USFS, ODFW, ODEQ, OWRD) to ensure compliance with the requirements of the 401 WQC and the settlement agreement. The project license and the 401 WQC specify one set of minimum in-stream flows for the first seven years (2005 through 2011) of the project license (i.e. prior to the construction of fish passage facilities), and higher flows thereafter following the anticipated completion of anadromous fish passage facilities at Fish Creek, Slide Creek, and Soda Springs. Resource agency staff consulted for this review confirm that the applicant is in compliance with all currently applicable flow requirements.

***If YES, go to B.***

**PASS.**

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### B. Water Quality

- 1) Is the Facility either:**
- a) In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986?**
  - Or**
  - b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?**

**YES**

The project's 401 WQC was issued in 2002 as part of the relicensing and subsequently amended in 2005. The main issues addressed by the 401 WQC include temperature, hydrogen ion concentration (ph), and biological criteria that encompass specific additional pollutant concerns. The biological criteria focus on protection of beneficial uses of anadromous fish passage, salmonid spawning, salmonid rearing, and resident fish and aquatic life with a series of requirements related to flows, fish passage, ramping, habitat improvements, reservoir operations, reconnecting aquatic sites, dissolved oxygen,

total dissolved gas, and more. The 401 WQC includes requirements that go beyond the Settlement Agreement provisions (see “Regulatory and Legal Background” above).

The applicant obtained a letter from ODEQ dated August 27, 2009 confirming the applicant’s compliance with all requirements of the 401 WQC. In a recent consultation with ODEQ, the staff person confirmed continued compliance with all conditions required to date.

ODEQ staff did note a possible dissolved oxygen concern in the Soda Springs bypass reach. Field audit results identified a criterion exceedance in the reach, while the continuous measurement monitoring showed compliance. ODEQ requested, and the applicant agreed, to repeat the field measurements; however, resampling will occur only after the completion (by the end of 2011) of Soda Springs fish passage construction currently underway. ODEQ staff noted the possibility that increased flows scheduled to be implemented post-passage installation may resolve the possible dissolved oxygen issue.

Given the uncertainty about whether a dissolved oxygen violation has occurred, the applicant’s agreement to implement an ODEQ-directed measure to clarify the reach’s dissolved oxygen status, ODEQ’s confirmation of the applicant’s track record of compliance to date, and agency staff’s view that further flow increases to be implemented after the completion of fish passage construction may resolve the possible dissolved oxygen problem, this reviewer deems the applicant to be in compliance, for all practical purposes, with current 401 WQC conditions. However, the recommendation to certify this project as consistent with LIHI criteria includes a condition that the applicant obtain and provide to LIHI a letter from ODEQ clarifying whether or not the dissolved oxygen impairment has been resolved.

*If YES, go to B2.*

**2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?**

**YES**

As noted in an August 27, 2009 letter the applicant obtained from the ODEQ staff with oversight of the 401 WQC, “The North Umpqua River is listed as impaired for pH from RM 77 to RM 78 (i.e., the full-flow reach below the Lemolo 2 Powerhouse) and for temperature below Soda Springs dam. Fish Creek, a tributary to the North Umpqua River, is listed as impaired from the mouth to RM 18.6.”

*If YES, go to B3.*

**3) If the answer to question B.2 is yes, has there been a determination that the**

## Facility is not a cause of that violation?

### YES (with qualification)

Non-project-related violations. Of the three 303(d) listed reaches identified above, ODEQ staff confirm that the Facility either is not (in the case of Fish Creek temperature and dissolved oxygen exceedances) or is no longer (in the case of temperature violations below Soda Springs dam) a cause of the violations. Fish Creek exceedances occurred upstream as well as downstream of the former project diversion, and occurred after the applicant had ceased diversions; therefore, ODEQ staff stated the project is not considered to be a contributing factor (similar exculpatory information appears in Oregon's EPA-approved Umpqua Basin TMDL). Increased flows have resulted in temperature compliance in all other project reaches, including below Soda Springs.

Project-related pH exceedance at Lemolo 2. The facility is presently deemed to be a source of pH violation downstream of the Lemolo 2 Powerhouse. ODEQ placed the water body on the 303(d) list as a result of data collected in the 1990s for the project relicensing. The 401 WQC does not identify the specific source of the pH violation. However, ODEQ's Evaluation and Findings (E&F) Report that accompanies the 401 WQC and is the basis for the 401 WQC conditions discusses two occurrences of pH excursions in the Lemolo 2 forebay documented in a consultants' report, and attributes those exceedances to macrophytes in the Lemolo 2 forebay.

ODEQ staff wrote the following in an email to this reviewer in response to an inquiry about the limited number of 303(d) listings for the North Umpqua River:

*The 2004/2006 Integrated Report Database is a good source of [water quality] information, but is frequently limited to "spot" measurements and short-duration studies. The continuous data collected below SS [Soda Springs] and elsewhere throughout the project may offer a more focused analysis of Project effects on water quality.*

401 WQC remedy for 303(d) violation. The 401 WQC measure specifically identified to resolve and bring into compliance the pH exceedance below the Lemolo 2 powerhouse is the rerouting of the powerhouse discharge to Toketee Reservoir (instead of to the full-flow reach of the North Umpqua River below the powerhouse and upstream of Toketee Reservoir). According to ODEQ staff, the condition placed on the applicant to bury the tailrace was intended to address a suite of water quality issues, including the high priority concerns of mitigating ramping impacts and addressing total dissolved gas (TDG) and dissolved oxygen exceedances in the full-flow reach of the North Umpqua river below Lemolo 2, while at the same time addressing the pH concern. In the words of the ODEQ staff, the agency "saw a spectrum of issues, and saw a single remedy for all of them" in the tailrace rerouting measure.

Tailrace rerouting implementation status. The applicant reports that final approval to reroute the Lemolo 2 tailrace is expected from FERC imminently; the applicant is

reviewing contractor bids, groundbreaking is expected February 1, 2011, and the project should be completed by November 2011. Testing for pH exceedances needs to be undertaken in the spring or fall; therefore, the earliest opportunity to conduct the required monitoring to know definitively whether the pH issue has been addressed by the tailrace rerouting is Spring 2012.

WQC requirements for effectiveness monitoring. The 401 WQC requires monitoring for pH at the Lemolo 2 powerhouse “at the completion of annual maintenance... [ ] ...in the first year the maintenance schedule in the North Umpqua Settlement Agreement Section 6.6 is in effect.” However, the settlement agreement refers to measures to be instituted during “planned maintenance.” The applicant reports that maintenance is not automatically performed on an annual basis, but as needed. Because the Lemolo 2 powerhouse was completely rebuilt in 2009, the maintenance contemplated by the 401 WQC has not been needed. The lack of an automatic effectiveness monitoring trigger for pH is problematic once the tailrace rerouting is constructed in 2011, since LIHI will have no guaranteed way to know if its water quality criteria is being met.

Alternative approach to demonstrating resolution of the pH excursion. As noted above, in 2009 the applicant rebuilt the Lemolo 2 powerhouse and dredged the forebay for its own operational reasons. In the course of consultations for this application review, ODEQ staff recognized that the dredging of the forebay may have resolved the pH exceedance identified in its evaluation report and findings as the likely result of excessive aquatic plant growth in the Lemolo 2 forebay. In a January 12, 2011 letter to LIHI (included as Attachment B to this report) ODEQ staff wrote the following:

*Data collected during the FERC relicensing effort confirmed elevated pH measurements in the Lemolo 2 forebay which was likely related to abundant macrophyte growth. The 2002 ODEQ Evaluation Report and Findings document determined that “tailrace discharge is the proximate cause for the Clean Water Act §303(d) water quality limited listing in the full flow reach. The proposed PME measure [i.e., re-routing the tailrace discharge] will address the §303(d) listing for pH in the North Umpqua River full flow reach.”*

*In 2009, PacifiCorp dredged the forebay which largely eliminated the abundance of aquatic macrophytes. Since this action was not contemplated at the time of FERC relicensing, ODEQ did not require post-maintenance monitoring. Given that dredging has now been completed, PacifiCorp may elect to perform post-maintenance pH monitoring to determine if water quality in the Lemolo 2 forebay should continue to be identified as a contributing factor to the §303(d) listing.*

*To facilitate this determination, PacifiCorp should develop a monitoring plan in consultation with ODEQ to characterize pH in the tailrace discharge of the Lemolo 2 powerhouse. If the monitoring data clearly demonstrate that tailrace discharge is within the acceptable numeric*

*criteria range, then ODEQ may determine that Project operation does not contribute to the existing pH §303(d) listing.*

Discussion. While on technical grounds the project should fail this LIHI criterion by virtue of contributing to a 303(d)-listed violation of pH standards in the Lemolo 2 full-flow reach, it is apparent from the wide-ranging scope of the other provisions of the 401 WQC and consultations with ODEQ staff that this 303(d) listing was not of a sufficient magnitude to drive ODEQ's formulation of, and timetable for, implementing measures to address water quality concerns. The applicant has already implemented to the resource agencies' satisfaction measures to address a number of major concerns such as the elimination of ramping in the bypass reaches and resolution of temperature violations in all project reaches. The applicant is on schedule to implement the ODEQ-required measure to address the 303(d) pH violation, and all other required measures. Finally, and most significantly, there is reason to believe the applicant may have already eliminated the source of the water quality impairment by dredging the forebay, thus significantly reducing the presence of the aquatic plants identified in the ODEQ Evaluation and Findings report as the likely source of the pH exceedance. For the foregoing reasons, the LIHI Governing Board may wish to consider the project as meeting this LIHI criterion, provided certification of this project includes a condition that achieves the following:

- The applicant shall implement an ODEQ-directed timetable to characterize pH in the tailrace discharge of the Lemolo 2 powerhouse within one year of LIHI certification. Upon completion of that monitoring, the applicant shall obtain and provide to LIHI a letter from ODEQ that states whether the reach in question complies with state water quality standards for pH. In the event that the ODEQ finds the project continues to be a contributor to the 303(d)-listed impairment for pH in the vicinity of the project, LIHI reserves the right to suspend or revoke certification.

In order to allow the Governing Board to consider this option, this review assumes the board will opt for conditional approval and the project's passage of this criterion, and continues the evaluation of the project against the remaining criteria.

*If YES, go to C.*

**PASS (with conditions).**

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## **C. Fish Passage and Protection**

**1) Is the Facility in Compliance with *Mandatory Fish Passage Prescriptions* for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?**

**YES**

The applicant is implementing numerous fish passage measures consistent with resource agency prescriptions memorialized in the settlement agreement and incorporated into the applicant's FERC license. Resource agency staff consulted for this review confirm that the applicant continues to be in compliance with all fish passage prescriptions for both anadromous and riverine fish.

FWS, USFS, and ODFW staff consulted during this review highlighted in their comments that upstream and downstream passage at Soda Springs remains the major anadromous fish passage measure yet to be implemented and tested for effectiveness. (Tailrace barriers are discussed at C.6.). Thus, as noted at the outset to this report, LIHI is being asked to certify a project in which the applicant has complied with all fish passage requirements in its license and settlement with resource agencies, but key effectiveness measures that are intended to achieve low-impact fish passage are neither in place nor demonstrated to be working yet.

*If YES, go to C5.*

**5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of *Riverine* fish?**

**YES**

Project documents report and agency staff confirm that the applicant is in compliance with riverine fish passage requirements (rainbow trout). Central to this compliance was completion in 2006 of an upgraded fishway at the Lemolo 2 dam for upstream passage of native rainbow trout.

*If YES, go to C6.*

**6) Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?**

**YES**

Project documentation and agency staff confirm the applicant is in compliance with entrainment protection requirements. The applicant completed in 2007 a tailrace barrier at the Soda Springs powerhouse to protect adult salmon and steelhead, and in 2010 installed a trashrack at the Toketee intake to minimize downstream movement of trout longer than five inches (in order to minimize predation on downstream salmonids). An upcoming significant milestone is construction of a tailrace barrier at the Slide Creek powerhouse to protect salmonids migrating upstream once Soda Springs upstream passage is in place, expected to be completed by the end of 2010.

*If YES, go to D*

**PASS.**

#### D. Watershed Protection

- 1) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline**

NO

The project is sited almost entirely on public lands, primarily USFS lands.

*If NO = go to D2*

- 2) Has the facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1., and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?**

NO

Note: The applicant responded "yes" to this question, citing the funds described below. However, projects that meet this criterion are rewarded with three extra years of certification for establishing,

"a buffer zone extending 200 feet from the high water mark; or, an approved watershed enhancement fund that could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1. and has the agreement of appropriate stakeholders and state and federal resource agencies. A Facility can pass this criterion, but not receive extra years of certification, if it is in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project."

In the present circumstances, the project lies almost entirely on federal lands, and the watershed protection requirements are mitigation for project impacts mandated by federal agencies. This reviewer has therefore evaluated the project under criterion D.3., below.

*If NO = go to D3*

- 3) Has the facility owner/operator established through a settlement agreement with appropriate stakeholders that has state and federal resource agencies agreement an appropriate shoreland buffer or equivalent watershed land protection plan for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation)**

## YES

The FERC license incorporates an extensive array of requirements that the applicant make payments and implement measures focused on watershed protection, mitigation, and enhancement to benefit fish and wildlife, although a great many of the activities are focused on aquatic, rather than upland terrestrial issues. These include the establishment of two funds:

- **Mitigation Fund:** graduated payments totaling \$8 million and \$250,000 annually thereafter for the duration of the license to implement projects that mitigate the facility's impacts to wetlands and stillwater amphibian habitat, riparian and aquatic species connectivity, vegetation management, terrestrial species connectivity, and soil loss and soil productivity resulting in erosion.
- **Tributary Enhancement Fund:** Established with an initial \$2 million payment, then augmented by an annual \$430,000 contribution for seven years, to offset project impacts to fish and wildlife that would not otherwise be mitigation by other settlement agreement provisions.

The terms of the FERC license, which incorporates the settlement agreement provisions, require the development and implementation of multiple plans addressing terrestrial wildlife monitoring, vegetation management, erosion control, transportation management, and visual resources across the project, as well as site specific plans required in conjunction with construction activities. Then there are scores of explicitly mandated measures, such as road decommissioning, culvert replacement, and wildlife crossings, that related to protection of watershed resources. Resource agency staff contact in the course of this review confirmed the applicant's compliance with all measures scheduled to be completed to date.

*If YES = Pass, go to E*

**PASS.**

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## E. Threatened and Endangered Species Protection

### 1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?

## YES

In 2002, the following species were potentially present in the vicinity of the project and federally listed as threatened or endangered: Columbian white-tailed deer (*Odocoileus virginianus leucurus*), rough popcornflower (*Plagiobothrys hirtus*), Oregon Coast coho salmon (*Oncorhynchus kisutch*), Canada lynx (*Lynx canadensis*), northern spotted owl (*Strix occidentalis caurina*), bald eagle (*Haliaeetus leucocephalus*), and



Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*). In the intervening years, bald eagle and the Douglas County Distinct Population Segment (DPS) of the Columbian white-tailed deer were delisted. State-listed threatened or endangered species potentially present in the vicinity of the project at that time included bald eagle, rough popcornflower, Kincaid's lupine, and northern spotted owl, California wolverine (*Gulo gulo luteus*), peregrine falcon (*Falco peregrinus anatum*), and Umpqua mariposa lily (*Calochortus umpquaensis*).

In December 2002 both NOAA Fisheries and FWS filed final Biological Opinions concluding that operating the project under the terms of the settlement agreement would not be likely to jeopardize the continued existence of these species. State and federal agencies tasked with oversight for endangered species issues did not raise any concerns about listed species when consulted in the course of this application review.

***If YES, go to E2.***

**2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?**

**YES**

The State of Oregon adopted a Conservation Plan for the Oregon Coast coho in 2007 under the state's Native Fish Conservation Policy, prior to the federal government's 2008 listing of the species as "threatened" under the federal Endangered Species Act. It is important to note that the state plan was not adopted as the federal recovery plan under the ESA; NOAA has not completed a final federal recovery plan for Oregon Coast coho salmon as of this writing.

ODFW staff contacted during this application review raised no concerns about compliance with state conservation plan requirements related to the project for the endangered species noted above. NOAA Fisheries would not respond to questions about the project; however, as noted in the preceding paragraph, there is as yet no federal recovery plan for coho salmon.

***If YES, go to E3.***

**3) If the Facility has received authority to incidentally *Take* a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authority?**

**YES**

Resource agency staff contacted in the course of this application review raised no concerns about compliance with the terms and conditions of the incidental take statements issued by NOAA Fisheries and FWS as part of their respective Biological Opinions. The NOAA Fisheries terms and conditions pertaining to Oregon Coast coho salmon are consistent with settlement agreement provisions relating to flow conditions, riparian vegetation, erosion and sediment control, fish passage, tributary enhancement, spawning habitat, and aquatic connectivity; NOAA Fisheries also added conditions relating to construction activities. FWS' terms and conditions concern limiting and reporting project-related activities that may affect northern spotted owls, white-tailed deer, and bald eagles, and reporting bald eagle roosting sites.

*If YES, go to E4.*

- 4) If a biological opinion applicable to the Facility for the threatened or endangered species has been issued, can the Applicant demonstrate that:**
- a) The biological opinion was accompanied by a FERC license or exemption or a habitat conservation plan? Or**
  - b) The biological opinion was issued pursuant to or consistent with a recovery plan for the endangered or threatened species? Or**
  - c) There is no recovery plan for the threatened or endangered species under active development by the relevant Resource Agency? Or**
  - d) The recovery plan under active development will have no material effect on the Facility's operations?**

**YES**

FERC adopted the incidental take terms and conditions of the NOAA Fisheries and FWS biological opinions as mandatory conditions and license articles in its November 2003 license for the project.

*If YES, go to F*

**PASS.**

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## **F. Cultural Resource Protection**

- 1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?**

**YES**

The project's FERC license requires the applicant to implement a 2005 "Programmatic

Agreement Among the Federal Energy Regulatory Commission and the Oregon Historic Preservation Officer for Managing Historic Properties that May be Affected by a License Issuing to PacifiCorp for the Operation of the North Umpqua Hydroelectric Project in Douglas County, Oregon (FERC No. 1927)." The applicant, USFS (Umpqua National Forest), BLM, and Cow Creek Band of Umpqua Tribe of Indians signed the programmatic agreement as concurring parties. FERC approved a final plan in 2005, and the applicant has submitted annual reports documenting consultation with the Oregon State Historic Preservation Office, USFS, BLM, and the tribe and concurrence that the applicant was meeting its obligations under the agreement (now referred to as a Historic Properties Management Plan), as well as a "rolling action plan" guiding implementation activities. The applicant submitted the most recent of its annual reports in June 2010 and an approved action plan in December 2010. Consultations with Oregon State Historic Preservation Office staff confirm that Pacificorp is in compliance with its cultural resource protection requirements.

*If YES, go to G.*

**PASS.**

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## **G. Recreation**

- 1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?**

**YES**

The FERC license incorporates settlement agreement requirements that the applicant implement a recreation resources management plan governing the funding of recreation operations, maintenance, and capital improvements; public access to project reservoirs, stream channels, and adjacent lands for recreational purposes (to the extent consistent with public safety and FERC requirements); USFS law enforcement related to land- and water-based recreation activities within the project boundaries; public information programs; annual monitoring; and \$150,000 for meeting the compliance requirements of the Umpqua National Forest Plan within the project boundaries. The applicant is also required to keep Lemolo Lake at or near full pool during the peak recreation season between Memorial Day through Labor Day, to post real-time flow data on the internet for all project gages for the benefit of recreational boaters, and to provide notice to the public of scheduled maintenance releases at the project developments. USFS has oversight of these requirements, and USFS staff consulted in the course of this application review confirmed that the applicant is in compliance with all requirements scheduled to date.

*If YES, go to G3.*

- 2) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?**

**YES**

The FERC license reflects settlement agreement requirements stipulating that the applicant provide free access to the reservoirs and downstream reaches of the river. USFS consulted in the course of this review did not raise concerns about this issue.

*If YES, go to H.*

**PASS.**

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## **H. Facilities Recommended for Removal**

### **1) Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?**

**NO**

Resource Agency Recommendations considered in Low Impact Hydropower certifications must be, among other things, issued pursuant to a legal or administrative proceeding or other legally enforceable agreement. No such Resource Agency Recommendation has been issued for the project.

*If NO, facility is low impact.*

**PASS.**

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**FACILITY IS LOW IMPACT**

## RECORD OF CONTACTS

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Date of Conversation: 11/4/2010  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Chris Stine, Oregon Department of Environmental Quality  
Telephone/email: 541-686-7810  
Areas of Expertise: Water Quality

Mr. Stine offered to provide a chart he created to track 401 WQC requirements and compliance progress. His predecessor in the job drafted the 401 WQC, which extensively references terms of the settlement agreement. The 401 WQC emphasizes increased minimum flows; they were developed based on modeled flows for compliance with temperature criteria, with years of monitoring of specific reaches to back the modeling. Temperature criteria are being met for all uses for all times of year. Most of WQ stds for which there are numeric criteria are being met in all the monitoring reaches.

One exception is a dissolved oxygen violation/excursion that may have occurred in the Soda Springs bypass reach during the monitoring period; Pacificorp has to wait until completion of fish passage construction at Soda Springs to resample, although increased flow requirements after passage is in place may resolve the issue.

Only other reach where numeric criteria were not met is Fish Creek; the criteria were not met there during a monitoring period, but Pacificorp was not diverting at that time, so exceedance can't be attributed to the project.

There was a discrepancy between field audit numbers and what Pacificorp reported; Pacificorp was required to do monthly field audits to confirm that continuous monitoring gauges & instrumentation were reliable, in particular for DO. Field audits appeared to show regular excursions in the bypass, but those field audit measurements were collected during period of rapid DO changes, so would want confirmatory audits done during more stable period. ODEQ asked and Pacificorp agreed to repeat measurements, but it can't do so until construction of the Soda Springs fish ladder is over. The requirement is for resampling in the first July following implementation of the increased instream flows (condition 6c of the 401). If the continuous measurement was right, Pacificorp is in compliance; if field measurements were right, they are out of compliance.

There are ramping limits and minimum flow requirements for various reaches; e.g., will soon be conducting test of a canal shutoff device, when need to dump water in case of a breach to avoid erosion problems – device allows for controlled drainage back to river. Wet test needed, requires ramping event. That necessitates authorization from RCC to operate project in way that violates operating requirements. Pacificorp regularly requests approval to run tests, and the Resource Coordination Council (RCC) usually approves. That is an example of how the company interacts regularly with the RCC.

There has been nothing but open communication between ODEQ and Pacificorp, and the company has been responsive. He would have to characterize the relationship among the company and agencies as a strong and positive one. The company does not attempt to skirt the letter or intent of the 401 or settlement agreement, reports are timely.

Outstanding measures are tied to post-modification actions e.g., the Lemolo 1 Forebay PH requirement; the forebay is filling at this moment, and the company will implement required monitoring next August. The Lemolo 2 powerplant below the tailrace will require pH monitoring after annual maintenance of powerhouse. Below the powerhouse the PME requires burial of the tailrace discharge rather than discharging to the full flow reach of the river. The discharge will instead go to Toketee Lake to reduce ramping effects. This is scheduled to be done end of 2011 or so; required DO monitoring will be done after completion.

Actual construction schedules are hardwired in the settlement agreement; consult the settlement agreement to get a feel for the schedule. There have been changes, e.g. RCC collectively agreed to extend the construction date a year for the Lemolo 2 reroute because most company resources are focused on Soda Springs fish bypass.

The RCC meets monthly via phone. Hosted/led by Monte Garrett, Pacificorp or Rich Gross, principal aquatic scientist for Pacificorp. Check in about completion milestones. Annually have a 2-day in person meeting, annual review, look at accomplishments/deficits, look forward to next years requirements. Usually held in January. Annual RCC report “North Umpqua Protection Mitigation and Enhancement Measures Report” published by Pacificorp is a good source of information:  
<http://www.pacificorp.com/es/hydro/hl/nur.html#>

ODEQ is a party to the settlement agreement, but ODEQs mission is protecting water quality/environmental quality from effects of the project; so want to draw attention to requirements related to that under the 401. ODEQ oversight restricted to compliance with WQ.

In summary: Pacificorp is doing a good job; the company is using great field methodology and reporting. There was one component that needs to be remeasured [Soda Springs bypass dissolved oxygen], but with new flows should be fine.

Date of Conversation: 11/3/2010 (email); 11/4/2010 (phone call)  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Craig Kohanek, Oregon Water Resources Department  
Telephone/email: [kohanerc@wrp.state.or.us](mailto:kohanerc@wrp.state.or.us); 503-986-0823  
Areas of Expertise: Flows

He emailed me the following on 11/3/2010:

*N. Umpqua Items for LIHI questions relative to OWRD authority.*

*Drafted and implemented the Flow Monitoring Plan for Bypass Reaches and Other Compliance-related Gages. (Satisfies FERC License Article 403 and SA Section 5.5.) Originally signed in 02/2004, new version signed in 12/2007. New methods much more accurate, less variability in flow fluctuations.*

*Clearwater Reconnection: This was the first major mitigation project to be implemented. It required that "...PacifiCorp, in consultation with ODFW and USDA-FS and subject to approval by OWRD, shall design and construct a structure in the lower Clearwater River near Toketee Reservoir to reconnect the Clearwater River and the North Umpqua." This was "ground-zero" for learning how to work with each other (i.e. design rev's, getting each agencies expert's input or sign-off, permits that are needed, etc...).*

*Reconnection of numerous streams to the North Umpqua and Clearwater Rivers that had previously been intercepted into the project canals and flumes without the benefit of a water right.*

*The first amending of the SA, relative to building salmon spawning habitat in the Soda Springs Bypass Reach.*

We discussed the following on 11/4/2010:

Pacificorp is definitely living up to their responsibilities; some things have bumped out due to a learning curve, especially about the need for permits. E.g., In the case of the Clearwater Reconnect, they weren't able to implement as timely as wanted because they needed Corps of Engineers and OR Department of State Lands and ODEQ WQ permits, and that put everything back a bit. One of the most telling points was habitat restoration below Soda Springs in bypass reach; Pacificorp said "we don't think we can get as much as we thought we could" and SA was amended to get offsite (or downstream) mitigation to compensate.

Relative to OWRD, the focus is on monitoring of bypass reaches. The settlement agreement required the installation of new monitoring equipment that has increased accuracy – better for monitoring, better for streamflow.

With implementation aspects of the learning curve and trust issues were worked through; the period of the settlement agreement negotiations was more confrontational, post settlement agreement we have learned to work with each other. There has been continuity with Rich Gross and Monte Garrett of Pacificorp.

Regarding the Soda Springs controversy, at some point during the negotiations one of the federal agencies said Soda Springs dam ought to come out, and that become a rallying point for the environmental organizations. Soda Springs fish passage will provide increased salmonid habitat access; not as much as if Soda Springs came out, but it will provide 4-6 miles for Salmon, 35 miles for steelhead; however, should discuss this issue with the fish folks. Soda Springs acts as re-regulation dam because it is the last of the system; losing that, it really changes the economics of the whole system, reduces profitability.

Relative to the settlement agreement and what is memorialized in license, Pacificorp has been a good player. Before they fully mobilized to construct the Soda Springs fish ladder they asked to take a look at whether doing projects lower on the system would get better productivity; not really the point – Soda Springs.

Pacificorp also had change of ownership from Scottish Power to Berkshire Hathaway. But hasn't adversely affected implementation; now with recession, cost of materials and labor have gone down substantially, and that has motivated them to move forward with all speed on the many construction measures.

The company has learned how to provide an early heads up about any problem that pops up; takes time to build trust. Originally had monthly in-person meetings, now only 4 times a year in person.

Important milestones over the next five years include:

- Operational passage of Soda Springs end of 2012
- Tailrace barrier at Slide Creek
- Continue all connections, bridges for wildlife completed (have been on time so far; have been effective for elk).

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Date of Conversation:	11/5/10
Application Reviewer:	Gabriela Goldfarb, Consultant
Person Contacted:	Dave Harris, Oregon Department of Fish and Wildlife
Telephone/email:	541-440-3353 Ext. 257, <dave.a.harris@state.or.us>
Areas of Expertise:	Fisheries, wildlife



Fish passage at Soda Springs is a big issue; there were other measures, already implemented, that were huge for trout (e.g., Lemolo 2 fishway modification). Pacificorp jumped on it early. Clearwater 2 reconnect – reopened Clearwater to Umpqua; had been closed to N. Umpqua and redirected to Toketee Lake; now designed and built fishway to restore passage, splitting flow. Now in testing, almost 2 years, trout are coming back. Screening at Fish Creek – now, trout no longer will end up in dead end. Forebay at Fish Creek facility was completed in '08. Tailrace barrier at Soda Spring was completed, protects adult salmonids, and is a precursor to the fish ladder. Soda Springs fish passage project is on track; FERC delayed them a bit because of design of downstream screen, but still on track to finish on time, in the fall of 2011.

Pacificorp at first was trying to push Soda Springs out farther than was in the settlement agreement, perhaps because of high cost of materials; now with drop in costs the company is in high gear to get everything done as soon as possible.

The company is currently starting on the Slide Creek tailrace barrier above Soda Springs. Did all prep work this year, should work by the time Soda Springs ladder comes online, protects adults that make it up the new ladder. Put in 4-6 per year of wildlife crossings over or under canals, flow reconnect also completed, and built 4 wetlands so far.

Pacificorp has done a great job meeting agency needs. Hard thing sometimes to keep up with Pacificorp's submittals.

Key milestones in the next 5 years:

- Soda Springs fish ladder.
- Implement anadromous flows above Soda Springs (pre-anadromous flows already in place). Have been working on flow diverter devices.
- Wildlife crossings and aquatic reconnect crossings; building required number per year, right on schedule, but will continue to ride herd on that.
- Few more wetlands to build – about 3 -- looking for sites
- Long term mitigation monitoring for life of the license; clauses say in year 15 we'll get together and see if it's still needed – agencies want to make sure that monitoring continues through the length of the license.

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Date of Conversation:	11/5/10
Application Reviewer:	Gabriela Goldfarb, Consultant
Person Contacted:	Pam Sichtung, U.S. Forest Service
Telephone/email:	(541) 957-3342, <psichtung@fs.fed.us>
Areas of Expertise:	fish & wildlife, watershed protection, recreation, cultural resources

Soda Springs fish passage is the cornerstone of the agreement. Other key elements include tailrace barriers and canal shutoff & drainage systems.

USFS has unique responsibilities because it has 2800+ acres of land on this project, so recreation program, road maintenance and culvert, cultural resources are also important; the agency is not just focused on water, fish, and wildlife. USFS has to look at the whole landscape.

Implementation has been going on since 2001 – early implementation was taking place even before the license was finalized. Those projects focused on aquatic restoration, wetland projects, increasing flows.

Regarding recreation, Pacificorp has taken on campgrounds that are “project induced”; maintains/repairs roadways, pays for operation and maintenance, funded toilets and boat ramps, is paying for an accessible fishing pier that is going to be installed. These resources are at Toketee, Lemolo, near forebays; also interpretive signing, trail restoration.

Regarding cultural resources, the company has implemented measures related to interpretive signing, and carried out cultural, botanical (include noxious weeds), wildlife, and fisheries surveys; even though NEPA review was done for the hydro project, need all those surveys before the company can do campground construction.

Regarding law enforcement, the company provides a small amount of funding for patrols at campgrounds.

Other measures: Gravel augmentation in fisheries is an area the company is still working on; 600 culverts need replacement or upgrading; the company doesn't fund that entirely, depends on cost share for a particular road. Vegetation management along transmission and distribution lines – no snags/trees on transmission lines that could cause fires or other problems. Noxious weed control – everywhere – along transmission and distribution lines, roads, project areas.

No pattern of foot dragging, just a few small delays.

Key milestones in the next five years:

- Fish passage @ Soda Springs
- Wetland mitigation
- Culvert aquatic passage
- Recreation capital improvement projects
- Slide Creek tailrace barrier

Date of Conversation: 11/8/2010  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Rob Burns, U.S. Fish and Wildlife Service  
Telephone/email: Rob\_Burns@fws.gov  
Areas of Expertise: (541) 672-6601

Pacificorp is making a good faith effort based on what was agreed upon. Resource agencies have a good working relationship with the company. Some larger projects like this require lots of biologist exchange and consultation, and Pacificorp is good about giving Resource Agencies access in terms of participating from the outset and giving feedback about design throughout the process. This is a complex project, 8 developments.

Soda Springs passage and juvenile fish facilities are just not done. Re juvenile fish facilities: collect/safely return downstream migrants. Will go through fish collection facility. Additional engineering challenge. Reservoir up above fluctuates up to 16 feet per day. So facility is going to have to float up and down— this is experimental technology.

Slide creek tailrace barrier; needs to be built, needs to be operational.

Lemolo 2 re-route: another big milestone. Starting construction 2011, will be completed – will bypass ramping of that portion of the river, allow a more natural flow.

Once these three big things are done, we do the monitoring, and they perform as expected, everyone will be comfortable with results of the project.

He was not involved in the settlement agreement negotiations. NGOs were forced out of this process and it went into litigation.

His understanding is that the negotiation process was stalemated; agencies were told by Washington D.C. that process would restart under new rules; feds were told that taking out Soda Springs was not an option. Restarted talks with those rules, NGOs left negotiations. Original FWS and Forest Service people were taken off, new people assigned.

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Date of Conversation: 12/2/10  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Brett Swift, American Rivers  
Telephone/email: (503) 827-8648 ext 1, <bswift@americanrivers.org>  
Areas of Expertise: Flows, water quality, fish & wildlife

There were two phases of negotiations; when she first got involved Soda Springs removal was on the table and Pacificorp did a scenario analysis and engineering report – but then Pacificorp pulled back. USFS made a recommendation for dam removal, but she is not clear if it was filed as a 4e recommendation.

Pacificorp withdrew, officially ended the negotiations, played a political card, and USFS backed off its dam removal recommendation. Then Pacificorp reconvened negotiations, NGOs came to the table, but were not satisfied that the emerging proposals adequately addressed the problem of Soda Springs, among other issues such as flow regimes and terrestrial passage over water conveyances (canals, flumes). The content of the negotiations are confidential, so she cannot share additional details.

When, in 2008, Pacificorp suggested watershed-based mitigation in place of fish passage at Soda Springs, it caused a big stink among NGOs, and the idea was shut down, but served to raise NGO suspicions about Pacificorp trying to skirt its responsibilities.

She has not tracked closely the current status of the project.

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Date of Conversation:	12/3/10
Application Reviewer:	Gabriela Goldfarb, Consultant
Person Contacted:	Monte Garrett, Pacificorp
Telephone/email:	(503) 813-6629, <Monte.Garrett@Pacificorp.com>
Areas of Expertise:	North Umpqua Hydro Project

Mr. Garrett addressed a number of questions regarding the Lemolo 2 tailrace rerouting from the full flow reach of the North Umpqua to Toketee Lake, which is the requirement to address pH exceedances that resulted in a 3-03(d) listing of the waters in the vicinity of the Lemolo 2 development:

- The final approvals for the rerouting project are expected back from FERC imminently.
- Expect to start construction February 1st; currently reviewing contractor bids.
- Expect it to be completed November 2011.

In 1992-94 there were consultants who did work as part of relicensing, and they concluded there was too-high pH in L2 forebay; had been records of exceedances below the powerhouse in the past (forebay exceedances thought to be cause). In the 401 WQC, though not certainty about high pH, If forebay was the source, expected to be the way to divert it from the full flow reach by taking it to Toketee where wetlands would moderate.

Main reason for reroute is to mitigate ramping in the full flow reach, but thought it would also address pH. Moving forward with that purpose in mind – but other big issues are high TDG and low DO problems.

High pH comes from high vegetation in standing water (as in forebay). Pacificorp dredged the forebay in summer 2009; however, there was no requirement for monitoring pH after that project (project was undertaken for operational reasons, was not required by the license); the WQC requires monitoring during maintenance. Don't do maintenance annually; that powerhouse was rebuilt in 2009, no maintenance event needed in spring or

fall, so haven't had the opportunity. Expect to have low pH. The WQC monitoring requirement is really geared to evaluating full flow reach for TDG and DO after the reroute completed.

Could measure it at any time; but best to wait till after reroute is done to confirm that nowhere along any of the facility line is there high pH. Spring of 2012 would be the first/best to document that.

Could measure now just the forebay, but that wouldn't conclusively clear the pH issue.

Regarding the settlement agreement:

He will send me document with timeline. Pacificorp petitioned FERC for postponement of NEPA process for update of the record, agencies supported that. FERC had not yet issued its "ready for environmental analysis" order that initiates the NEPA process –

There was never a documented [formally filed] recommendation for Soda Springs dam removal.

Collaborative watershed analysis done in 1997-1998 was the source of the dam removal recommendation; so that was the basis of the NGOs and USFS position; since Soda Springs is the reregulation facility, Pacificorp pulled the plug. (Thought was to investigate the compatibility of the project with the recently (1995) produced NW Forest Plan and Aquatic Conservation Strategy (a defining set of principles). Those documents had come out just as Pacificorp submitted its application.

When negotiations reconvened, the agencies were willing to go for a new approach short of removal.

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Date of Conversation: 11/30/2010  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Chris Stine, ODEQ  
Telephone/email: Stine.Chris@deq.state.or.us  
Areas of Expertise: Water Quality

Chris Stine sent the following email:

**From:** STINE Chris <Stine.Chris@deq.state.or.us >  
**Subject:** RE: Follow up questions on NUHP  
**Date:** November 30, 2010 11:29:03 AM PST  
**To:** Gabriela Goldfarb <gabriela@goldfarbconsulting.com>

**My comments in red, below.**

**From:** Gabriela Goldfarb [mailto:gabriela@goldfarbconsulting.com] **Sent:** Monday, November 29, 2010 8:43 PM **To:** STINE Chris **Subject:** Follow up questions on NUHP

Dear Chris:

I'm writing in follow-up to the voicemail I left you this morning. I have just a few clarifying questions about the North Umpqua project, spelled out below. I would be happy to go over this with you by phone if it is easier -- let me know. Many thanks!

Gabriela

### Temperature

This is most likely a note-taking error of mine, but my notes reflect a comment from you that for "most of the reaches," temperature criteria are being met for all uses for all times of year. However, later in the conversation, you mentioned that "temperatures are no longer being monitored because compliance has been demonstrated." Can you help clear up my confusion?

Temperature compliance has been demonstrated in all the bypass reaches with the exception of Fish Creek. During a portion of most summers, the 7DMX temperature at the lower portion (although not the upper part) of Fish Creek occasionally exceeds 18C. However, these events occur during a portion of the year when PacifiCorp is prevented from diverting water for hydropower because the natural stream flow is below the minimum flows established in the TMDL, 401, Settlement Agreement, and FERC License. Since these temperatures presumably reflect the natural condition and are unaffected by Project operations, DEQ will not require further monitoring of this reach. If in the future PacifiCorp requests and is granted authority to divert water when base flows are below the minimum instream flow, DEQ may require additional monitoring to characterize the thermal effect of this withdrawal.

### Dissolved Oxygen

Have I captured the DO situation correctly?:

Soda Springs bypass reach: Dissolved oxygen in the Soda Springs bypass reach is the only possible violation; there was a sampling difference (between field audit and continuous measurement) that yielded conflicting results in regards to compliance; Pacificorp has agreed to repeat measurements, but cannot do so until after Soda Springs fish passage construction is complete. (Because flows will be significantly increased at many upstream reaches after fish passage is completed, DO is unlikely to be a problem.) Yes. (It's reasonable to suspect that increased flows will benefit water quality. However, I would hesitate making any pre-decisional determination which suggests DO is unlikely to be a problem.)

Fish Creek: There was a DO violation at Fish Creek, but it occurred at a time when Pacificorp was not diverting, so the project is not to blame.

Yes.

Lemolo 2 powerhouse: Pacificorp is required to bury the tailrace (pipe the tailrace) and discharge to Toketee Lake in lieu of discharge to the full flow reach of the North Umpqua

in order to reduce ramping effects; this project is scheduled to be completed by the end of 2011 (this represents a delay agreed to by the resource agencies because Pacificorp is focusing on Soda Springs fish passage). After completion Pacificorp will conduct required DO monitoring.

Yes

#### Ramping

Pacificorp has complied with the requirement to eliminate all ramping in the eight bypass reaches (except that ramping may occur during planned project maintenance and emergency shutdowns).

Yes

#### pH

Lemolo 1 Forebay: forebay is presently being filled, monitoring for pH will take place next August. Yes

Lemolo 2 powerplant below tailrace: pH monitoring to be done after annual maintenance of powerhouse. Yes

Also: TDG Condition 9(b)(2):

PacifiCorp shall, within three months after the discharge is rerouted (or at any later date approved by ODEQ), study TDG saturation levels immediately below the discharge from the new water conveyance system and in the penstock inlet for a minimum of 72 hours in accordance with a study plan approved by ODEQ.

#### 303d Listing

While this overlaps with some of the questions above, as part of my review I take a separate look at the 303d listing status of waters in the project vicinity. I looked for violations for the six criteria noted in the FEIS (biological, habitat modification, flow modification, pH, temperature, and total dissolved gas). Assuming that was the correct starting point, and I performed my search of the DEQ database correctly, the list I generated from the proposed 2010 list noted only temperature below Soda Springs, and pH between River mile 77 and 78 (does the latter line up with the Lemolo 1 forebay, or Lemolo 2 tailrace?).

The 2004/2006 Integrated Report Database is a good source of WQ information, but is frequently limited to “spot” measurements and short-duration studies. The continuous data collected below SS and elsewhere throughout the project may offer a more focused analysis of Project effects on water quality. I’m afraid I don’t have an accurate river-mile map to place RM 77/78 with respect to Project developments, but I’m certain you could get this from PacifiCorp.

I hope this helps.

Date of Conversation: 11/5/2010  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Ed Meyer, National Marine Fisheries Service  
Telephone/email: Ed.Meyer@noaa.gov  
Areas of Expertise: Fisheries

**From:** Ed Meyer <Ed.Meyer@noaa.gov>  
**Subject:** **Re: Questions for NOAA Regarding Pacificorp's North Umpqua Hydro Project**  
**Date:** November 5, 2010 12:37:15 PM PDT  
**To:** Gabriela Goldfarb [gabriela@goldfarbconsulting.com](mailto:gabriela@goldfarbconsulting.com)

Hi Gabriela,  
I'm sorry that I didn't get to your email earlier. I have been out of the office for the past 10 days and I'm still trying to play catch up. With regards to LIHI certification, it is the policy of our office not to comment on these types of actions. I'm sorry, but I'm not going to be able to help you with this. Sorry.

Ed Meyer, Fish Passage Engineer  
National Marine Fisheries Service

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Date of Conversation: 12/13/10  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Monte Garrett, Pacificorp  
Telephone/email: (503) 813-6629  
Areas of Expertise: North Umpqua Hydropower Project

Regarding 303(d) listed stretch at Lemolo 2:

In a 2000 report scientific consultants documented the pH issue in the forebay, suspected as the source of pH exceedance in the tailrace; "recommendation out of that report" was to dredge the forebay to address pH. Acknowledged that no resource agency recommendation was issued; Pacificorp just went ahead and dredged the forebay (needed to do so for operational reasons anyway). It is now filled.

I clarified that because the resource agency recommendation to address the problem, expressed in the 401 WQC, was the Lemolo 2 powerhouse discharge rerouting – not dredging the forebay. To clear the project of being a cause of the 303(d) listing, Pacificorp needs a letter from ODEQ agreeing that the forebay was a likely cause of the pH problem, and that if testing in spring, 2011 of forebay shows no pH, that the project is not a contributor. (Monte said that if testing full flow reach still showed pH problems, it would mean that the project was not the source; told him ODEQ would have to say that.)



Date of Conversation: 12/16/10  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Chris Stine, ODEQ  
Telephone/email: Stine.Chris@deq.state.or.us  
Areas of Expertise: Water Quality

ODEQ has no reason to disagree that macrophytes were the cause of pH in the L2 forebay. ODEQ's Evaluation and Findings (E&F) Report that accompanied the 401 WQC is ODEQ's justification for including certain conditions, i.e., the basis for conclusions that are distilled into the conditions document. ODEQ reviewed all available info (not only info submitted by Pacificorp) to develop that report. In the section on pH in the E&F document, discuss two occurrences of pH excursions in the Lemolo 2 forebay attributable to primary productivity. Pacificorp has likely addressed that by dredging.

The condition placed on Pacificorp for pH is to bury the tailrace. However, that measure is addressing a whole suite of issues -- reduce ramping and address TDG & DO, as well as pH. ODEQ saw a spectrum of issues, and saw a single a remedy for all of them. That tipped the balance to get Pacificorp to agree to the reroute.

ODEQ will not contemplate engaging in a process to delist the river. [Explained that that was not the response LIHI thought necessary.] However, certain that ODEQ can craft a response that addresses Pacificorp's contributions to pH in the listed stretch.

Monitoring that was done and reported in the E&F Report indicates that macrophytes in forebay were been identified as source of the pH problem in the Lemolo 2 forebay, so there is good reason to think that dredging and maintaining the forebay would address the pH problem. ODEQ is willing to draft a letter requesting a workplan from Pacificorp, to be developed in consultation with and approved by ODEQ, that outlines the monitoring criteria ODEQ would like to see to demonstrate that the forebay dredging was sufficient to address the pH excursion problem. ODEQ will consider data supplied by Pacificorp to prove that the project is no longer a contributor to the excursion. ODEQ expects to be able to issue such a letter by January 17th.

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Date of Conversation: 1/18/11  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Kristen Boyles, Earthjustice Legal  
Telephone/email: (206) 343-7340, <kboyles@earthjustice.org>  
Areas of Expertise: Environmental Groups' North Umpqua lawsuit

In response to a draft of the paragraph provided to her describing the lawsuit, Ms. Boyles suggested revisions clarifying that the removal of Soda Springs dam was the focal point of the lawsuit, and that the specific objections raised in the suit spoke to the following issues:

- By not doing record of decision and EIS, USFS deprived the public of a chance to

- have its voice heard regarding the question of dam removal; and
- The USFS reversal of its position in the first phase of settlement negotiations advocating removal of the dam to its position in the second phase of endorsing retention of the dam occurred without scientific underpinning or explanation.

She noted that there were many other important issues different environmental organizations cared about, but the only one that went to trial was the issue of Soda Springs dam.

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Date of Conversation: 1/18/11  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Julie Osborne, Oregon State Historic Properties Office  
Telephone/email: julie.osborne@state.or.us  
Areas of Expertise: Cultural Resources

Ms. Osborne sent the following email:

**From:** Julie Osborne <julie.osborne@state.or.us>  
**Subject:** Re: North Umpqua Hydroelectric Project (FERC 1927)  
**Date:** January 18, 2011 7:52:04 AM PST  
**To:** Gabriela Goldfarb <gabriela@goldfarbconsulting.com>, Roger Roper <roger.roper@state.or.us>  
**Cc:** Dennis Griffin [dennis.griffin@state.or.us](mailto:dennis.griffin@state.or.us)

*Dear Ms. Goldfarb:*

*Yes, we confirm that PacifiCorp is in compliance with its cultural resource protection requirements. I've included Dr. Dennis Griffin in this correspondence as he works with the archaeological resources. He indicates that "PacifiCorp is doing a great job of adhering to their HPMP for this project. I have no complaints what so ever and wish that all other projects were run so efficiently with such good communication."*

*Should you need additional information, please let us know.*

*Thanks -*

*Julie Osborne, Preservation Specialist  
Oregon SHPO  
725 Summer St NE  
Salem OR 97301  
503-986-0661*

**ATTACHMENT A: Description of North Umpqua Hydroelectric Project Developments**

<b>Name</b>	<b>Facility Description</b>	<b>Other Information</b>
Lemolo No. 1	120-foot-high diversion dam, a 419-acre reservoir (Lemolo Reservoir) with a total storage of 11,752 feet, 16,310 feet of canal and flumes extending from the Lemolo dam to the penstock intake, a 7,338-foot-long penstock, and a powerhouse on the North Umpqua River at the mouth of Warm Springs Creek, 4.5 miles downstream of the dam at Lemolo Reservoir.	Storage in Lemolo Reservoir is used to control floods, increase power generation when demand is high in the late fall, and augment flows in the river downstream of the eight developments.
Lemolo No. 2	25-foot-high diversion dam that impounds a 1.4-acre pond with no active reservoir storage, 69,503 feet of canal and flumes extending from the diversion dam to the forebay, a 24.2-acre forebay with total storage of 230.6 acre-feet, a 3,975-foot-long penstock, and a powerhouse.	The Lemolo No. 2 dam is about 190 feet downstream of the Lemolo No. 1 powerhouse, and the Lemolo No. 2 powerhouse is about 3,500 feet upstream of Toketee Lake.
Clearwater No. 1	The development includes a 17-foot-high diversion dam located about 8.1 miles upstream of Toketee Lake impounding 11.8-acre Stump Lake, 13,037 miles of canal and flumes extending from Stump Lake dam to the forebay, a 16.3-acre forebay with total maximum storage capacity of 120.8 acre-feet, a 4,863-foot-long penstock, and a powerhouse with a single turbine-generator having a rated capacity of 15,000 kW.	The Clearwater Development is the uppermost development on the Clearwater River, which has its confluence with the North Umpqua River near Toketee dam. The powerhouse discharges directly into the Clearwater No. 2 diversion.
Clearwater No. 2	The development includes an 18-foot-high diversion dam on the Clearwater River 140 feet downstream from the Clearwater No. 1 powerhouse, a 1.2-acre impoundment with no active storage, 31,235 feet of canal and flumes extending from the diversion dam to an 8.6-acre forebay with total maximum storage capacity of 70.7 acre-feet, a 1,169-foot-long penstock, and a powerhouse on the North Umpqua River at Toketee Lake.	
Toketee	The development includes a 58-foot-high embankment dam on the North Umpqua that impounds the 96.9-acre Toketee Lake (with a total maximum storage capacity of 1,051 acre-feet), 6,994 feet of pipe and tunnel extending from Toketee dam to the penstock, a single 1,067-foot-long penstock that splits	The Toketee development is located at the confluence of the Clearwater and North Umpqua Rivers. The powerhouse is located on the North Umpqua approximately two miles

<b>Name</b>	<b>Facility Description</b>	<b>Other Information</b>
	into three approximately 158-foot-long sections near its downstream end, and a powerhouse with three turbine-generators	downstream of Toketee Lake, which serves as the forebay for the development and provides active storage to regulate flow through the powerhouse.
Fish Creek	The development consists of a 6.5-foot-high diversion dam located on Fish Creek approximately 6 miles upstream of the creek's confluence with the North Umpqua, a 3-acre reservoir, 25,662 feet of canal and flumes extending from the diversion dam to a 9.3-acre-foot forebay with a maximum total storage capacity of 110.3 acre-feet, a 2,358-foot-long penstock, and a powerhouse with a single turbine-generator set having a rated capacity of 11,000 kW.	The powerhouse is located on the North Umpqua between the Toketee powerhouse and Slide Creek diversion dam. The reservoir impounded by the diversion dam has no active storage, but the forebay has active storage and is used to reregulate water from off-peak to peak demand periods. A fish ladder and a sluiceway are incorporated into the diversion dam.
Slide Creek	The development includes a 30-foot-high diversion dam located on the North Umpqua 900 feet downstream of the Toketee powerhouse and impounding a 2-acre reservoir with maximum total storage capacity of 43 acre feet, 9,653 feet of canal and flumes extending from the dam to the penstock, a 374-foot-long penstock, and a powerhouse with a single turbine-generator having a rated capacity of 18,000 kW.	The powerhouse is located on the North Umpqua 1.3 miles upstream of Soda Springs dam.
Soda Springs	The development includes a 77-foot-high diversion dam located on the North Umpqua River about 1.3 miles downstream of the Slide Creek powerhouse, a 31.5-acre reservoir with a total maximum storage capacity of 411.6 acre-feet, a 2,112-foot-long steel pipe extending from the diversion dam to a surge tank, a 168-foot-long penstock extending from the surge tank to a powerhouse, and a powerhouse with a combined turbine-generator set having a rated capacity of 11,000 kW.	The storage capacity of Soda Springs reservoir is used to ensure a minimum flow in the North Umpqua downstream of the development.

ATTACHMENT B



Oregon

Department of Environmental Quality

John A. Kitzhaber, M.D., Governor

**Western Region Eugene Office**  
165 East 7th Avenue, Suite 100  
Eugene, OR 97401  
(541) 686-7838 FAX (541) 686-7551  
OTRS 1-800-735-2900

January 12, 2011

Fred Ayer, Executive Director  
Low Impact Hydropower Institute  
34 Providence Street  
Portland ME 04103

**By Electronic Filing**

RE: North Umpqua Hydroelectric Project (FERC No. 1927)  
Water Quality Monitoring in Support of Low Impact Hydropower Institute Certification

Dear Mr. Ayer,

In December 2010 the Oregon Department of Environmental Quality (ODEQ) was contacted by Gabriella Goldfarb Consulting on behalf of PacifiCorp Energy (PacifiCorp) for information in support of PacifiCorp's application for Low Impact Hydropower Institute (LIHI) certification for the North Umpqua Hydroelectric Project (FERC Project No. 1927).

In addition to reviewing Project compliance with §401 certification requirements, Ms. Goldfarb was tasked with addressing the potential effect of Project operations on waters which currently do not meet state standards. Currently, the North Umpqua River is identified on ODEQ's §303(d) list of impaired water bodies as a result of occasional violations of the state pH water quality standard. The affected river segment is from river mile (RM) 77 to 78 in the general vicinity of the Lemolo 2 powerhouse. Data collected during the FERC relicensing effort confirmed elevated pH measurements in the Lemolo 2 forebay which was likely related to abundant macrophyte growth. The 2002 ODEQ Evaluation Report and Findings document determined that "tailrace discharge is the proximate cause for the Clean Water Act §303(d) water quality limited listing in the full flow reach. The proposed PME measure [i.e., re-routing the tailrace discharge] will address the §303(d) listing for pH in the North Umpqua River full flow reach."

In 2009, PacifiCorp dredged the forebay which largely eliminated the abundance of aquatic macrophytes. Since this action was not contemplated at the time of FERC relicensing, ODEQ did not require post-maintenance monitoring. Given that dredging has now been completed, PacifiCorp may elect to perform post-maintenance pH monitoring

to determine if water quality in the Lemolo 2 forebay should continue to be identified as a contributing factor to the §303(d) listing.

To facilitate this determination, PacifiCorp should develop a monitoring plan in consultation with ODEQ to characterize pH in the tailrace discharge of the Lemolo 2 powerhouse. If the monitoring data clearly demonstrate that tailrace discharge is within the acceptable numeric criteria range, then ODEQ may determine that Project operation does not contribute to the existing pH §303(d) listing.

Please feel free to contact me should you have any questions regarding this matter.

Sincerely,



Christopher Stine, PE  
Hydroelectric Specialist  
ec: Gabriella Goldfarb, Gabriella Goldfarb Consulting  
Monte Garrett, PacifiCorp Energy  
Richard Grost, PacifiCorp Energy