



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

MAY 10 2007

REGISTERED MAIL  
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Mr Robert Barnes  
Puget Sound Energy PSE-09S  
PO Box 97034  
Bellevue, WA 98009-9734

Dear Mr. Barnes:

**RE: Baker River Hydroelectric Project (FERC No. 2150), Order No. 2525  
Water Quality Certification and Coastal Zone Management Consistency  
Determination**

The request for certification under Section 401 of the Clean Water Act (33 USC § 1341) for the licensing of the Baker River Hydroelectric Project (FERC No. 2150) in Skagit and Whatcom Counties, Washington, has been reviewed. The Department of Ecology, on behalf of the State of Washington, certifies that reasonable assurance exists that the Project, subject to and limited by the conditions stated by the enclosed Order, will comply with applicable provisions of 33 USC 1311, 1312, 1313, 1316, 1317, and other appropriate requirements of State law.

Pursuant to 16 U.S.C. 1456 et. seq. (Section 307(c)(3) of the Coastal Zone Management Act of 1972 as amended), Ecology concurs with the applicant's determination that this work will be consistent with the approved Washington State Coastal Zone Management Program. This concurrence is based upon the applicant's compliance with all applicable enforceable policies of the Coastal Zone Management Program, including Section 401 of the Federal Water Pollution Control Act.

This certification shall be deemed withdrawn if the Federal Energy Regulatory Commission (FERC) does not issue a license for the Project within five (5) years of the date of this issuance. This certification may be modified or withdrawn by Ecology prior to the issuance of the license based upon new information or changes to the Settlement Agreement or water quality standards or appropriate requirements of state law. If the certification is withdrawn, the Applicant will then be required to reapply for state certification under Section 401 of the Clean Water Act.

This certification is subject to the conditions contained in the enclosed Order. If you have any questions, please contact Alison Evans at 425-649-7160. The enclosed Order may be appealed by following the procedures described in the Order.



Mr. Robert Barnes  
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A copy of the Order may be obtained on Ecology's website at:  
[http://www.ecy.wa.gov/programs/wq/ferc/existing\\_certs.html](http://www.ecy.wa.gov/programs/wq/ferc/existing_certs.html).

Sincerely,



Kevin C. Fitzpatrick  
Water Quality Section Manager

Enclosure  
KCF:AE:bl

cc: FERC Secretary, Magalie Roman Salas  
FERC Project Lead, Steve Hocking  
FERC Service List for P-2150  
Jeannie Summerhays, Department of Ecology, NWRO Regional Director  
Alice Kelly, Department of Ecology, NWRO  
Alison Evans, Department of Ecology, Water Quality Program, NWRO  
Bob Fritzen, Department of Ecology, BFO, Environmental Shoreline Planner  
Brian Faller, State of Washington Office of Attorney General  
Chris Maynard, Water Quality Program, HQ-Dept of Ecology  
Brian Walsh, Water Resources Program, HQ-Dept of Ecology  
NWRO Files: FERC/Baker River Hydroelectric Project

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**STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY**

<b>IN THE MATTER OF GRANTING A</b>	)	<b>ORDER NO. 2525</b>
<b>WATER QUALITY CERTIFICATION TO:</b>	)	Re-Licensing of the Baker River Hydro-
Puget Sound Energy, Inc.	)	Electric Project (FERC No. 2150),
in accordance with 33 USC 1341	)	Skagit/Whatcom Counties,
FWPCA § 401, RCW 90.48.260	)	Washington
and WAC 173-201A	)	

TO: Mr. Robert Barnes  
Puget Sound Energy PSE-09S  
P.O. Box 97034  
Bellevue, WA 98009-9734

On March 10, 2005, Puget Sound Energy (PSE) filed an application with the State of Washington Department of Ecology (Ecology) requesting issuance of a certification under the provisions of Section 401 of the Clean Water Act (33 USC § 1341) to be submitted with its application for a license to the Federal Energy Regulatory Commission (FERC) for the Baker River Hydroelectric Project, FERC No. 2150 (the Project). On March 7, 2006 PSE withdrew and resubmitted its application with Ecology because the one-year review period ended before the SEPA process was complete.

## **1.0 NATURE OF EXISTING PROJECT**

The Project is located in the Northern Cascade Mountain Range northeast of the town of Concrete (Appendix A). The Project includes two hydroelectric facilities: Upper Baker Dam and Lower Baker Dam. The Project is managed for power generation, with a total capacity of 170 megawatts (MW), and for flood control, recreation, and fish resources.

Upper Baker Dam and the Baker Lake reservoir reside in Whatcom County. The dam is approximately 312 feet high and 1,200 feet wide at the crest. Water for hydropower is conveyed from the intake at the dam via two 320-foot-long penstocks to the powerhouse. Water from the dam and powerhouse empty into a tailrace that ultimately leads to Lake Shannon.

Lower Baker Dam is in the town of Concrete. The associated Lake Shannon reservoir extends through Skagit County and into Whatcom County. The Lower Baker Dam is approximately 285 feet high and 550 feet long. Water for hydropower is conveyed from the dam intake via a 1488 foot-long penstock to the powerhouse. Flow from the powerhouse empties into a tailrace, and then flows approximately 0.9 miles to the Skagit River.

## **2.0 AUTHORITIES**

In exercising authority under Section 401 of the Clean Water Act (33 USC § 1341) and the Washington State Water Pollution Control Act (RCW 90.48.260), Ecology has investigated this application pursuant to the following:

- 1) Conformance with all applicable water quality-based, technology-based, and toxic or pretreatment effluent limitations as provided under Sections 301, 302, 303, 306, and 307 of the Clean Water Act

(33 USC Sections 1311, 1312, 1313, 1316, and 1317, FWPCA Sections 301, 302, 303, 306, and 307);

- 2) Conformance with any and all applicable provisions of Chapter 90.48 RCW, including the provision to use all known, available and reasonable methods to prevent and control pollution of state waters as required by RCW 90.48.010; and
- 3) Conformance with the state water quality standards as provided for in Chapter 173-201A WAC authorized by 33 USC 1313 and by Chapter 90.48 RCW, and with other appropriate requirements of state law that are related to compliance with such standards.
- 4) Conformance with RCW 90.56, which prohibits discharge of oil, fuel or chemicals into state waters or onto land where such contaminants could potentially drain into state waters.

### 3.0 CURRENT STANDARDS

- 1) **Washington State Water Pollution Control Act.** The intent of actions required in this certification is to support the goals of the State of Washington to “maintain the highest possible standards to ensure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wildlife, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington” (RCW 90.48.010).
- 2) **Washington State Water Quality Standards (WAC 173-201A, 2006).** Within the Project area, the Baker Lake and tributaries are designated as Char Spawning/Rearing and the remaining Project waters are designated as Core Summer Salmonid Habitat under Washington’s Water Quality standards. Under these standards, water quality shall meet or exceed the requirements for all designated and existing uses. Use designations for Baker Project waterbodies are listed in WAC 173-201A-600 and WAC 173-201A-602. Specific numeric criteria for various water quality parameters, including total dissolved gas (TDG), temperature, turbidity, and dissolved oxygen (DO) are assigned in the water quality standards.
  - a) **Compliance schedule for dams.** (WAC 173-201A-510(5), 2006) A plan for water quality compliance for dams that cause or contribute to a violation of water quality standards must include a compliance schedule not to exceed ten (10) years.
  - b) **Toxics and oil spills.** (WAC 173-201A-260(2)(a), 2006 and RCW 90.56) Toxic concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health. RCW 90.56 prohibits any discharge of oil, fuel or chemicals into state waters or onto land where such contaminants could potentially drain into state waters.

### 4.0 FINDINGS

#### **BACKGROUND INFORMATION ABOUT THE EXISTING PROJECT**

- 1) The Project is managed for power generation, with an authorized capacity of approximately 170 MW, and for flood control, recreation, and fish and wildlife resources.

- 2) Before the Upper Baker Dam was built, Baker Lake existed as a natural lake that occupied approximately 550 acres of the valley bottom within the northern half of the current footprint of Baker Lake.
- 3) The construction, operation, and maintenance of these facilities were licensed by FERC in 1956. The Lower Baker Development (4,700 cfs, 79 MW unit) was originally constructed prior to federal licensing in 1925, while the Upper Baker Development (5,050 cfs, 91 MW, 2 units) was completed in 1959. The license issued in 1956 combined the operations of the Upper Baker and Lower Baker Developments into a single license.
- 4) The Baker River watershed covers 297 square miles and ranges in elevation from 10,778 feet above mean sea level (msl) at the summit of Mount Baker to 160 feet msl at the confluence of the Baker and Skagit Rivers near the town of Concrete. The Baker River is the second largest tributary to the Skagit River, which, in turn, is the largest river draining to Puget Sound. The Baker River's annual flow contributes approximately 16 percent of the Skagit River's flow.
- 5) The headwaters of the Baker River originate from glaciers and snowfields on Mount Baker, Mount Shuksan, and other nearby peaks. From its headwaters, the Baker River reaches the valley floor (elevation 1,000 feet msl) after about five miles. From this point, the Baker River Valley continues for about 25 miles to the confluence with the Skagit River. Lake Shannon and Baker Lake occupy about 16 lineal miles of the lower Baker River Valley.
- 6) Baker Lake is typically drawn down in the winter to provide storage for winter floods and spring runoff from snowmelt. Lake Shannon is not used for flood storage. Due to snowmelt and lower regional electricity demand during the warmer months, the reservoirs are refilled to nearly full pool between April and June. The reservoirs remain nearly full during the summer.
- 7) The waterbody from the Upper Baker Dam tailrace to Lake Shannon will be considered a Lake Class waterbody because water in this short section feeds directly into Lake Shannon. Much of this section fluctuates between riverine and lake characteristics depending on the elevation of Lake Shannon. Biologist with Ecology and WDFW have stated that the habitat in this stretch resemble lake-type habitat more than riverine habitat. It is a deep bedrock narrow canyon with no gravel. Fish use is more migratory than habitual.
- 8) *Fish Passage:* An upstream trap-and-haul fish passage facility, referred to as the adult fish trap, is located in the Lower Baker tailrace, 0.5 miles below the Lower Baker Powerhouse. The adult fish trap began operation in 1926 at the powerhouse, and was rebuilt and relocated in 1958. The adult trap includes a 150-foot-long barrier dam, fish trap, holding ponds, and fish lift. The barrier dam precludes most upstream anadromous fish migration and directs fish to the adult fish trap. The adult fish trap operates throughout the year, with the exception of a brief maintenance period in May or June. There are also downstream fish passage facilities in the forebays of both Upper and Lower Baker Dams.
- 9) *Fish Populations:* The primary fish of concern in the Skagit and Baker Rivers are Sockeye, Coho, Chinook, Steelhead, Pink, Chum, Native Char, Cutthroat, and Bull Trout. Of these species the Chinook and Bull Trout are federally listed as threatened and Steelhead are proposed as threatened; Coho is a species of concern and the Pink is considered a listing not warranted (FERC, 2006). Anadromous fish currently have access only to about 2,400 (731 m) feet of the 1.2 mile (1.9 km) long Lower Baker tailrace downstream of Lower Baker Dam. The Lower Baker tailrace is currently straight and entrenched, with an armored bed composed of cobble and boulder and no large woody debris or other obstructions that could provide hiding cover. Velocities are high throughout the Lower Baker tailrace when the Lower Baker Development is generating, and there are few refugia available for juvenile fish. The Lower Baker tailrace appears to be used primarily

as a migration corridor by both adult and juvenile fish. Adult fish are able to traverse the Lower Baker tailrace even when the Lower Baker Development is spilling. However, fish do appear to be reluctant to move through the Lower Baker tailrace when the Project is not generating and the Skagit River is low; the shallow riffle located just downstream of the fish barrier dam may be an impediment to upstream migration at low flows (*Study A02*, R2 Resource Consultants, Inc., 2004).

- 10) The portion of the Lower Baker tailrace between the Lower Baker Dam and the Lower Baker Powerhouse, also known as the Lower Baker bypass reach, has been deemed, by all practical means, inaccessible by humans. This 0.3 mile stretch of the river is bordered by the dam to the north, steep canyon walls to the east and west, and the powerhouse discharge to the south. Flows in the bypass reach are due to leakage and are approximately 30-100 cfs under normal operation, however the occasional release of spill water from the dam creates unpredictable flow conditions in this stretch and the sudden surges of water can be hazardous. The presence of adult salmon in this region is expected to be minimal since the fish barrier dam downstream of this point is designed to direct adult salmon to the fish trap for transport around the Baker dams.
- 11) A Settlement Agreement was filed with FERC on 11/30/04 that represents more than four years of collaboration between 20+ parties interested in the Project. In this agreement, PSE agreed to contribute considerable resources towards the protection, mitigation and enhancement of wildlife and fish resources, recreation, aesthetics, cultural resources and water quality. The minimum instream flow and ramping rate requirements reflected in this certification are a direct result of the efforts and numerous studies conducted by the parties involved.
- 12) According to RCW 90.48.422, Ecology cannot require PSE to provide additional flood control storage. RCW 90.48.422 specifically states that "with respect to federal energy regulatory commission licensed hydropower projects, [Ecology] may only require [an entity] to mitigate or remedy a water quality violation or problem to the extent there is substantial evidence such [entity] has caused such violation or problem". However, Ecology supports the provisions of Article 107 of the Settlement Agreement that addresses flood storage opportunities at the discretion of the U.S. Army Corps of Engineers, pending compensation to PSE.
- 13) Modeling studies show that the Baker Project reduces peak flows in the downstream Skagit River (*Study A-24*, R2 Resource Consultants, Inc., 2004), and that the Baker and Skagit Projects combined reduce the magnitude of a 100-year return interval flow event from 293,000 cfs to about 220,000 cfs (USACE, 2003). The Baker Project also significantly increases the rate of change of flow fluctuations in the downstream Skagit River (*Study A-24*, R2 Resource Consultants, Inc., 2004).
- 14) The effects of Baker Project operations on downstream aquatic habitats were evaluated using a suite of hydraulic and habitat models. Standard instream flow/physical habitat simulation models (<http://www.ecy.wa.gov/programs/wr/instream-flows>) were used to describe mainstem and off-channel habitats in the middle Skagit River. In addition, analyses of shoreline habitats exposed to hourly river level fluctuations and an effective spawning/incubation model were specifically developed to evaluate the effects of alternate operational scenarios. The habitat modeling and evaluation process were developed in coordination with tribal, federal, state, local and non-governmental organizations.

#### COMPLIANCE WITH STANDARDS

- 15) Current Water Quality: PSE recently performed an extensive Water Quality Study to assess the current water quality of the waterbodies (PSE 2004). Results of the study are summarized in Appendix B.



- 16) Water Quality standards are provided in Chapter 173-201A WAC; Appendix C summarizes some of the current standards that apply to the Project's waterbodies.
- 17) *Instream Flows*. Ecology agrees with the Aquatics Resource Group (ARG) that minimum instream flows and ramping rates are needed to support fish and other aquatic uses of the Skagit River and the Lower Baker tailrace. The instream flow and ramping rate evaluation involved extensive modeling with scientific input from the large group of professionals within the ARG. Ecology finds that the agreed upon flows will enhance conditions in the Skagit River during critical life stages of affected salmonids and serve as mitigation for some of the Project impacts on fish. This change in flow management has been determined to have an overall positive impact on downstream water quality. This certification requires minimum instream flows as detailed in Section 5.2 of this document.
- 18) *Turbidity*. The Project's reservoirs tend to reduce the turbidity in the system, in general, by providing additional settling time. However, reservoirs can also increase the duration of storm-related high turbidity periods due to the presence of un-settleable suspended solids. Drawing reservoir levels down to elevations where settled fine particles are present can re-suspended the particles and increase downstream turbidity. (See Section 5.3 for turbidity compliance measures).
- 19) *Total Dissolved Gas (TDG)*. TDG exceedances occur in the Lower Baker tailrace during ramp down procedures (approximately 0-2 times per day) and spills (about 1-2 times per year). (See Section 5.4 for TDG compliance measures).
- 20) *Temperature and Dissolved Oxygen*. The impacts of the Project on temperature and DO are expected to be influenced by the installation of the floating surface collectors. (See Section 5.5 for temperature and DO compliance measures).
- 21) There is reasonable assurance that the aesthetics and recreational potential within the Baker River watershed will be supported, sustained, and possibly enhanced as the requirements of the Settlement Agreement are fulfilled. The following aesthetics and recreation studies have been performed and can currently be obtained from PSE or from PSE's website: R05 Aesthetic/Visual Resource Study, R09 Electronic Traffic Monitoring, R11/R15 Recreation Capacity & Suitability Analysis and Recreational Trail Analysis, R12 Site Inventory, R13 Recreation Visitor Survey, R16 Recreation Needs Analysis.

## 5.0 CONDITIONS

In view of the foregoing and in accordance with Section 401 of the Clean Water Act (33 USC 1341), RCW 90.48.260 and WAC Chapter 173-201A, Ecology finds reasonable assurance that implementation of the compliance schedule and adaptive management strategy contained in the proposed license will result in the attainment and compliance with state and federal water quality standards and other appropriate requirements of state law provided the following conditions are met. Accordingly, through this order issued and enforceable under RCW 90.48, Ecology grants Section 401 water quality certification to PSE for the Baker River Hydroelectric Project (FERC No. 2150) subject to the following conditions. This order will hereafter be referred to as the "certification".

### 5.1 GENERAL REQUIREMENTS

- 1) The Project shall comply with all water quality standards (currently codified in WAC 173-201A), ground water standards (currently codified in WAC 173-200), and sediment quality standards (currently codified in WAC 173-204) and other appropriate requirements of state law that are related to compliance with such standards.

- 2) In the event of changes in or amendments to the state water quality, ground water, or sediment standards or changes in or amendments to the state Water Pollution Control Act (RCW 90.48) or changes in or amendments to the Federal Clean Water Act, such provisions, standards, criteria or requirements shall apply to the Project and any attendant agreements, orders, or permits, to the fullest extent permitted by law.
- 3) Discharge of any solid or liquid waste to the waters of the state of Washington without approval from Ecology is prohibited.
- 4) PSE shall obtain Ecology review and approval before undertaking any change to the Project or Project operations that might significantly and adversely affect the water quality (including impairment of designated uses) or compliance with any applicable water quality standard (including designated uses) or other appropriate requirements of state law.
- 5) Operations of the Floating Surface Collector (FSC) projects at Upper Baker Dam and Lower Baker Dam shall, to the extent reasonable and feasible, not cause any downstream water quality criteria exceedances. The downstream temperature and DO regimes shall, to the extent reasonable and feasible, not be negatively impacted by the operations of the FSCs.
- 6) This certification does not exempt, and is provisional upon, compliance with other statutes and codes administered by federal, state, and local agencies, including the state's Coastal Zone Management Act.
- 7) The Washington State Department of Fish and Wildlife (WDFW) requires a Hydraulic Project Approval (HPA) (under 75.20 RCW) for work in waters of the State. PSE will obtain an HPA from WDFW for any activity within the Baker Project waterbodies that may affect water quality or designated uses, prior to the beginning of those activities, and must comply with all conditions of the applicable WDFW HPA. To ensure compliance with HPA requirements contact WDFW, currently available at: Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, WA 98501-1091, (360) 902-2200. For further information on HPA requirements and WDFW contacts, visit the following respective web pages: <http://www.wa.gov/wdfw/hab/hpapage.htm>, <http://www.wa.gov/wdfw/depinfo.htm>.
- 8) Ecology retains the right by order to require additional monitoring, studies, or measures, in consultation with PSE, if it determines there is likelihood or probability that violations of water quality standards or other appropriate requirements of state law have or may occur, or insufficient information exists to make such a determination.
- 9) Ecology reserves the right to issue administrative orders, assess or seek penalties, and to initiate legal actions in any court or forum of competent jurisdiction for the purposes of enforcing the requirements of this certification.
- 10) Ecology retains the right by order to modify schedules and deadlines, in consultation with PSE, provided under this certification or provisions it incorporates.
- 11) If a conflict or inconsistency arises between this certification and the Settlement Agreement or any part thereof, the terms of this certification shall govern.
- 12) If five or more years elapse between the date this certification is issued and issuance of the new FERC license for the Project, this certification shall be deemed to be expired and denied at such time and PSE shall send Ecology an updated 401 application that reflects the current conditions, regulations and technologies. This provision shall not be construed to otherwise limit the reserved authority of Ecology to withdraw, amend, or correct the certification before or after the issuance of a FERC license.

- 13) This certification may be modified or withdrawn by Ecology prior to the issuance of the license based upon significant new information or changes to the Settlement Agreement or water quality standards or appropriate requirements of state law that are related to compliance with such standards.
- 14) Ecology reserves the right to amend this certification if it determines that the provisions hereof are no longer adequate to provide reasonable assurance of compliance with applicable water quality standards or other appropriate requirements of state law that are related to compliance with such standards. Such determination shall be based upon new information or changes in (i) the construction or operation of the Project, (ii) characteristics of the water, (iii) water quality criteria or standards, (iv) Total Maximum Daily Load (TMDL) requirements, or (v) effluent limitations or such other applicable requirements of state law. Amendments of this certification shall take effect immediately upon issuance, unless otherwise provided in the order of amendment, and shall be appealable to the Pollution Control Hearings Board pursuant to RCW 43.21B. Ecology shall transmit such amending orders to FERC to update FERC's records as to the current certification conditions.
- 15) Copies of this certification and associated permits, licenses, and approvals shall be kept on site and made readily available for reference by PSE, its contractors and consultants, and Ecology.
- 16) PSE shall allow Ecology access to inspect the Project and Project records required by this certification for the purpose of monitoring compliance with the conditions of this certification. Access will occur after reasonable notice, except in emergency circumstances.
- 17) PSE shall, upon request by Ecology, fully respond to all reasonable requests for materials to assist Ecology in making determinations under this certification and any resulting rulemaking or other process.
- 18) The conditions of this certification should not be construed to prevent or prohibit PSE from either voluntarily or in response to legal requirements imposed by a court, the FERC, or any other body with competent jurisdiction, taking actions which will provide a greater level of protection, mitigation, or enhancement of water quality or of existing or designated uses.
- 19) If an action required under or pursuant to this certification requires as a matter of federal law that the FERC (or another federal agency) approve the action before it may be undertaken, PSE shall not be considered in violation of these requirements to the extent that FERC (or such other federal agency) refuses to provide such approval, provided that PSE diligently seeks such approval and so notifies Ecology.
- 20) Submittals required by this certification are summarized in Appendix D. Unless indicated otherwise, submittals shall be sent to the permit manager at the Department of Ecology, Northwest Regional Office, Water Quality Section, 3190 160th Avenue SE, Bellevue, Washington 98008.
- 21) This certification addresses work associated with the Project including Project operation and related construction, including turbine installation at Lower Baker and the floating surface collectors at each dam. Any additional work not specified in this certification that may impact water quality will require attainment of any and all applicable permits and/or certifications at the appropriate time. PSE shall consult with Ecology to determine whether any such additional work triggers the need of additional permits or a separate Section 401 Certification. If a project would result in a new discharge or alteration to an existing discharge that is not specifically addressed in this certification, it will in most cases require modification of this certification or a new Section 401 Certification, depending on the circumstance.
- 22) PSE shall submit a Water Quality Protection Plan (WQPP) for the operation of the Project. The plan shall be developed using the guidelines in Section 5.10 of this certification. The WQPP shall

be submitted to Ecology for approval within a year of license issuance. An annual report describing implementation of the WQPP shall be submitted with the annual Water Quality Report required in Section 5.6 of this certification.

## **5.2 INSTREAM FLOWS AND RAMPING RATES**

The Project shall protect the designated uses listed in WAC 173-201A-200 by complying with the primary instream flow requirements as set forth by the Settlement Agreement and as approved by the WDFW. These requirements are as follows:

- 1) Interim Operations. Until the new turbine units are installed at Lower Baker Development, PSE shall conduct operations in accordance with the Interim Protection Plan (IPP) analyzed in the Biological Opinion for Endangered Species Act Section 7 Consultation for the Baker River Hydroelectric Project, NOAA Fisheries Consultation No. 2002/01040, or as approved by FERC. During this interim period, and effective upon license issuance, PSE shall use best efforts to protect other species of salmonids not addressed in the IPP by reducing the maximum flow from generation of 4,100 cfs to 3,200 cfs from the Lower Baker Development, or less if possible, during the spawning season, from September 1 to December 31. PSE shall investigate methods and make best efforts to reduce ramping rates towards the standards established in Table 1. In making its best efforts, PSE shall consider the best interests of the fish resources by limiting the rate of change of incrementally decreasing flows, limiting the amount of daily amplitude change, and minimizing the difference between spawning and incubation flows. These flows may not necessarily be preferred for energy generation, but will be within the operational limitations of the existing Lower Baker dam and powerhouse. PSE shall document their efforts to reduce ramping rates and the affect the various approaches have on water quality; this information shall be provided in the annual Flow Implementation Report (see Annual Reporting).
- 2) Instream Flows and Ramping Rates. PSE shall, beginning within 90 days following installation of the new generating units at the Lower Baker Development, operate the Project such that the minimum and maximum instream flows and ramping rates are consistent with those detailed in the Flow Implementation Plan (FIP), as required in Article 106 of the Settlement Agreement. Those flow, ramping rate, and pool elevation requirements are summarized in Table 1. In the event that the Army Corps' District Engineer (ACOE) directs PSE to operate the Lower Baker reservoir to provide up to 29,000 acre-feet of storage in accordance with Article 107, PSE shall implement the storage accordingly, following the construction of any necessary facilities modifications, and the FIP shall be revised to incorporate such changes.
- 3) The ramping rates shall apply on the Skagit River at transect 1, but will be measured on the Baker River based upon an established relationship shown on a table or curve to be developed by PSE by seeking input from the ARG, WDFW, the Upper Skagit Indian Tribe, the Sauk-Suiattle Indian Tribe, the Swinomish Indian Tribal, the United States Fish and Wildlife Service (USFWS), National Oceanic & Atmospheric Administration (NOAA) Fisheries, and Forest Service of the United States Department of Agriculture (USDA-FS), and in consultation with Ecology, and in accordance with any approval received from Ecology.  
  
These ramping restrictions are to be in effect whenever the flow, as calculated at the Skagit River above the Baker River confluence, is less than or equal to 26,000 cfs.
- 4) Construction of New Units. To achieve this flow regime and meet these ramping rates, PSE shall, upon FERC approval of a construction plan and schedule: 1) install two or more new generating units with a total capacity of approximately 1500 cfs at the Lower Baker Development; and, if needed, 2) alter the existing facilities.

Table 1. Instream Flows and Ramping Rates

Lower Baker Development				Upper Baker Development	
Engineering Module: 3 turbines (one 4,100 cfs turbine, two 750-cfs turbines)					
Period	Min. Instream Flow (cfs)	Max. Instream Flow (cfs) <sup>(1)</sup>	Downramping Rates <sup>(2)</sup>	Max Daily Pool Level Change	
Aug 1-31	1,000	3,600	1-inch per hour day and night	Max pool fluctuation ≤ 0.5 ft per rolling 24-hr period	
Sep 1-3	1,000	3,600			
4-9	1,000	3,600			
10-30	1,000	3,200			
Oct 1-7	1,000	3,200 <sup>(1)</sup>		2-inches per hour day and night	No constraints on max daily pool level changes
8-15	1,000	3,200 <sup>(1)</sup>			
16-20	1,000	3,200 <sup>(1)</sup>			
21-31	1,200	3,600 <sup>(1)</sup>			
Nov 1-15	1,200	3,600 <sup>(1)</sup>	0 inches per hour day and 2 inches per hour night		
16-30	1,200	3,600 <sup>(1)</sup>			
Dec 1-31	1,200	3,600 <sup>(1)</sup>			
Jan 1-31	1,200	5,600			
Feb 1-15	1,200	5,600		1-inch /hour day and night	
16-28	1,200	5,600			
Mar 1-31	1,200	5,600			
Apr 1-30	1,200	3,600			
May 1-8	1,200	3,600			
9-14	1,200	3,600			
15-22	1,200	3,600			
23-31	1,200	3,600	Max pool fluctuation ≤ 0.5 ft per rolling 24-hr period		
Jun 1-15	1,200	5,600			
16-30	1,200	5,600			
Jul 1-31	1,200	5,600			
(1) Maximum release constraints eliminated when Baker Lake inflow > 10% monthly exceedance flow OR Skagit River above the Baker River confluence > 24,000 cfs October through December.				No minimum flow requirements. No maximum instream flow constraint No downramping limitations for environmental interests.	
(2) Downramping rates measured at the Baker River at Concrete, but based on stage changes observed at Transect 1 on the mainstem Skagit River below the Baker River confluence (RM 56.5).					

- 5) Monitoring Flow and Ramping Rates. Instream flows and ramping rates shall be monitored at the USGS gauge (Station 12193500) Baker River at Concrete or via other approved means. In assessing compliance with the requirements summarized in Table 1, ramping rates shall be calculated on a minimum of a 15-minute basis, not averaged over an hour. In the event that the gaging site USGS #12193500 Baker River at Concrete is no longer operable and another gauge is used which is influenced by extraneous conditions (gauges of the Skagit River, or tributaries, wind action, fluctuations in flow from upstream projects, for example), ramping compliance conditions should be modified to reflect site-specific conditions for that new gauge.
- 6) Annual Reporting. Within two (2) years of license issuance and annually thereafter according to the schedule set forth in Article 102 of the Settlement Agreement, PSE shall prepare and submit a

Flow Implementation Report (FIR) regarding implementation of the requirements stated in Article 102 of the Settlement Agreement. PSE shall develop the report in consultation with the ARG, including specifically Ecology, USFWS, NOAA Fisheries, USDA-FS, WDFW, the Swinomish Indian Tribal Community, Upper Skagit Indian Tribe and Sauk-Suiattle Indian Tribe. PSE shall provide a minimum of 60 days for the consulted entities to comment before filing the FIR with FERC. The FIR shall include documentation of consultation, copies of comments, and PSE's responses based on Project-specific information.

- 7) Reporting Violations. In the event of a violation of the flow release or ramping schedule, PSE shall report such violations as soon as discovered, but no later than 24 hours. Email notification, or other reporting mechanisms, agreeable to the parties, shall be made to FERC, Ecology, and the ARG. PSE shall provide a follow-up report to FERC, Ecology, and the ARG within two (2) weeks of the incident stating what occurred, PSE's response, and any measures PSE proposes to reduce future similar occurrences.
- 8) Temporary Modification to Flows and Ramping Rates – Natural Events. The flow regime required by this certification may be temporarily suspended and modified in the event that drought conditions, or some other natural event outside of the control of PSE, limit PSE's ability to comply with the requirements of this article. Prior to operating outside of the conditions of this article, PSE shall: 1) notify the ARG and, at least, NOAA Fisheries, USFWS, Ecology, WDFW, the Sauk-Suiattle Indian Tribe, the Swinomish Indian Tribal Community, the Upper Skagit Indian Tribe, and Skagit County; 2) hold a meeting to identify potential options and solutions, which may include, but not be limited to, controlled generation and specified release patterns to protect fish to the extent practicable; and 3) obtain approval from Ecology. An example of controlled generation and specified release pattern solutions is as follows:

If the total Project live storage (Baker Lake and Lake Shannon combined) drops below 160,000 acre-feet, PSE shall notify the ARG and reduce generation at the Lower Baker Development to the minimum instream flow in effect at that time until Project storage has been restored above 160,000 acre-feet.

- 9) Temporary Modification to Flows and Ramping Rates – Emergencies. In the event that a condition affecting the safety of the Project or Project works, as defined by 18 C.F.R. § 12.3(b)(4), occurs and does not allow for consultation to occur before responding, then flows and ramping rates may be temporarily modified following any consultation with Ecology that is possible given the exigencies of the event. If the flow is so modified, PSE shall notify Ecology, FERC and the ARG as soon as practicable after the condition is discovered, without unduly interfering with any necessary or appropriate emergency repair, alarm, or other emergency action procedure. PSE shall provide all members of the ARG with a copy of any written report required by 18 C.F.R. § 12.10(a)(2) within ten (10) days of filing with FERC.
- 10) Flow modifications. Flows in Table 1 may be modified, as appropriate to protect, mitigate, and enhance aquatic resources. If PSE obtains or receives new information that suggests different flows may better protect, mitigate, and enhance aquatic resources, then PSE will provide the new information to the ARG to allow consideration of a modification to Table 1. The ARG may propose a modification provided that the modification shall not require PSE to make additional funds available or to increase the total expected cost or other impact on Project generation or capacity, subject to the reserved authority of FERC or Ecology. Modifications may be proposed at any time prior to completion of the FIP or through the plan amendment process thereafter. Following approval by FERC, PSE shall implement the modifications as required by the FIP.

### 5.3 TURBIDITY

- 1) The Project shall not cause any exceedance of the turbidity water quality standards set forth in Chapter 173-201A-200(1)(e) WAC in any waters of the state, including without limitation the Baker Project waterbodies.
- 2) *Background Turbidity Report:* The "background turbidity" referenced in the standards has yet to be determined for the Baker Project. Seasonal background levels (spring, summer, fall, and winter) shall be established as the average turbidity range measured at the adult fish trap under normal operating conditions. These seasonal ranges shall be determined by PSE within the first three (3) years of this certification. Within three (3) years of license issuance, PSE shall submit to Ecology a Background Turbidity Report that proposes fixed, seasonal, background turbidity ranges to be used for compliance. This report shall be submitted to Ecology's permit manager at the Department of Ecology, Northwest Regional Office, Water Quality Section, 3190 160th Avenue SE, Bellevue, Washington 98008.
- 3) *Turbidity Standard Exceedances:* Any exceedance shall be explained in the annual monitoring report required by *Section 5.6, Monitoring and Reporting*. PSE shall not be held responsible for turbidity standard exceedances if the elevated turbidity is caused by a significant storm or situation not Project related. In such an incident Ecology may request an assessment of the potential causes of the turbidity increase. This assessment may consider the impacts of recent flows through the dams, precipitation, recent construction, and reservoir elevations.
- 4) *Best Management Practices- Reservoir Elevations:* Re-suspension of fine sediments on the bottom of the Project's reservoirs may occur when the reservoirs' water levels are drawn down to very low elevations. PSE shall operate the Project's reservoirs to maintain a minimum NAVD88 surface elevation of 389 feet at Lake Shannon and 685 feet at Baker Lake to minimize the re-suspension of bottom sediments. Weekly turbidity monitoring shall be conducted by PSE when surface elevations are less than five (5) feet above the established minimum reservoir surface elevations. If turbidity increases due to low reservoir elevations at the fish trap or in the upper Baker tailrace by more than 5 NTU above seasonal background turbidity when background turbidity is 50 NTU or less, or increases more than a 10 percent when seasonal background turbidity is more than 50 NTU, PSE shall raise the corresponding reservoir level until such exceedance ceases unless Ecology otherwise approves.

Requests to drop below the minimum reservoir water surface elevation for repair, maintenance, construction upgrades, or to provide fish flows shall be made to Ecology for approval. PSE must apply for a short-term modification in writing to Ecology and WDFW at least three months prior to project initiation.

PSE shall submit turbidity and pool elevation data to Ecology in the annual monitoring report (see *Section 5.6, Monitoring and Reporting*) for use in determining the need to revise the turbidity BMPs established herein. Either PSE or Ecology may initiate future studies to reassess and modify the established minimum pool elevations or turbidity requirements. PSE shall, in consultation with Ecology and the Baker River Coordinating Committee (BRCC), develop a study plan to identify a new minimum water surface elevation. This study shall be implemented following approval by Ecology. Ecology retains its authority to revise the turbidity BMPs, by subsequent order, in the event that such BMPs are found to be inadequate to meet state water quality standards.

- 5) *Prolonged Elevated Turbidity Levels in Reservoirs:* In October 2003, a significant storm created elevated turbidity levels in the Baker reservoirs and tailraces that lasted until February 2004 (PSE, 2004). In this situation, the reservoirs stored the turbid water and released it at a rate slower than what would occur naturally without the dams. However, it is believed that a smaller amount of

suspended solids were released as a result of the dams since significant settling likely occurred during this time. At the writing of this certification it is not known if this prolonged release of turbidity has a detrimental impact on the biota; therefore, Ecology is not requiring further action for these circumstances at this time. However, if new information indicates that turbidity stored and released over time is harmful to the biota, Ecology may require, by subsequent order, studies to evaluate options to reduce or eliminate the potential problem.

#### **5.4 TOTAL DISSOLVED GAS (TDG)**

- 1) The Project shall not cause any exceedance of the TDG water quality standards as set forth in Chapter 173-201A-200(1)(f) WAC in any waters of the state, including without limitation the Baker Project waterbodies.
- 2) *TDG Standard Exceedances.* Any exceedance shall be explained in the annual monitoring report required by *Section 5.6, Monitoring and Reporting*. All spill releases shall also be detailed in the monitoring report. The TDG criteria shall not apply when flows in the Baker River exceed the rate equivalent to the seven-day, ten-year (7Q10) flood frequency, as defined in WAC 173-201A-200(1)(f)(i). It should be noted that elevated TDG levels formed during qualifying 7Q10 flow events at Upper Baker Dam are often observed several days later at the fish trap in the Lower Baker tailrace. This observed spike of TDG at the fish trap shall not be considered a TDG criteria exceedance if it was formed during a qualifying 7Q10 flow event at Upper Baker Dam.
- 3) *7Q10 Determination.* The 7Q10 flood flow value is based on a flow controlled by the Project. This value changes over time and will be impacted by the new flow regime and potential flood storage requirements in the Settlement Agreement. At the writing of this certificate, the controlled 7Q10 flood flow for the Baker River is 13,300 cfs. PSE or Ecology may request to reassess and modify the established 7Q10 flood flow; the modified flow shall be implemented following approval by Ecology.

For a controlled 7Q10 flood flow to qualify for the TDG exemption, it must be accompanied by a large run-off event (e.g., flood or snowmelt) that provides an equivalent amount of water to the drainage basin. PSE shall determine and report to Ecology within six months of the license issuance how much precipitation, in inches per 24-hour period, and other contributions to run-off produce a 7Q10 flood flow. It is recognized that spills are often required in anticipation of or after a National Weather Service forecasted 7Q10 flow event. For this Project, the TDG exemption shall begin on the date of any qualifying National Weather Service forecast of a 7Q10 event until 72 hours following the event. Allowance for this extended period encourages emergency spills of longer duration that produce lower levels of TDG. It is preferred to produce lower levels of TDG over a longer duration rather than produce higher levels of TDG over a shorter duration. PSE shall include in its Annual Water Quality Report to Ecology a summary of the duration of all spills, including those occurring prior to and after a 7Q10 flow event. During the exemption period PSE shall, to the extent possible, manage spill levels to minimize TDG production.

- 4) *TDG Exceedances Associated with Spills for Minimum Instream Flow Requirements or Spills Requested by Other Government Agencies.* To remain in compliance with the minimum instream flow provisions of this certification, releases of water by means other than the penstock and powerhouse may occasionally be required during powerhouse maintenance, inspection, or testing outages. These alternative releases will most likely result in TDG levels greater than 110% in the Lower Baker tailrace. Ecology has determined that no or low flow would harm biota more than the short-term elevated TDG levels, so TDG exceedances shall be allowed during these releases. However, PSE must apply in advance for a short-term modification in writing to Ecology and WDFW.



IDG minimization shall remain a priority and any means to reduce IDG production during all releases shall be explored and addressed in the IDG Abatement Plan.

- 5) *IDG Abatement Plan*: Existing data show that IDG compliance can be met except during ramp-down at Lower Baker Dam and during spill events at both dams. PSE shall submit to Ecology for approval a IDG Abatement Plan that proposes options for minimizing IDG production associated with spills and air-injected ramp-downs. The IDG Abatement Plan shall be submitted to Ecology for approval within one (1) year of license issuance. The Plan shall be updated and re-submitted for approval if any Project modifications are made that affect IDG production. The Project shall be operated according to this plan once approved with the objective of minimizing IDG producing events.
- 6) *Compliance Schedule*: PSE shall to the greatest extent reasonable and feasible eliminate ramp-down related exceedances with the installation of new generating units as required by Article 106(E) of the Settlement Agreement. PSE shall also to the greatest extent reasonable and feasible utilize the new generating units in a manner consistent with reducing IDG production. Spill events should be avoided except in anticipation of and during 7Q10 flow events, or as otherwise provided in the IDG Abatement Plan. Article 106(E) requires turbine installation within six (6) years after license issuance, therefore a compliance schedule of seven (7) years will allow sufficient time for the turbine installation and shakedown, at which point IDG compliance during ramp-down will potentially be achieved.

If compliance is not achieved within this seven (7) year period, PSE shall within six months submit to Ecology a feasibility analysis of all reasonable and feasible methods to achieve compliance, and, if applicable, a schedule describing when the methods can be applied. Upon review of such analysis, Ecology will issue an order setting forth appropriate compliance actions or if appropriate, evaluate whether modification of the application of the IDG standard with respect to these circumstances is warranted.

## **5.5 TEMPERATURE AND DISSOLVED OXYGEN**

- 1) The Project shall not cause any violation of the temperature or dissolved oxygen (DO) water quality standards as set forth in Chapter 173-201A-200(1)(c) WAC in any waters of the state, including without limitation the Baker Project waterbodies.
- 2) *Natural Conditions*: Baker Lake, Upper Baker Tailrace and Lake Shannon are classified as "lakes". The "natural conditions" referenced in the temperature and DO lake criteria are unknown for these waterbodies. The dams were built in 1925 and 1956, and natural conditions are difficult to apply to the Project's reservoirs and tailraces since the lower reservoir did not occur naturally and the upper reservoir was only a fraction of the size it is today. In this circumstance, instead of referencing "natural conditions", Ecology is requiring PSE to use all reasonable and feasible measures to achieve conditions that best protect the designated uses within the reservoirs and the Upper Baker Tailrace.
- 3) *Temperature and DO Standards Exceedances*: At the writing of this certification it is uncertain if the Project will meet these standards because these parameters may be significantly altered with the installation of the new turbines and/or FSCs. If the presence or operation of the Project causes water temperature or DO in the Lower Baker Tailrace to violate standards, PSE shall follow the compliance schedule procedure outlined below.
- 4) *Planned Project Modifications*: At the writing of this certification there are three planned Project modifications that may significantly impact temperature and DO downstream of the two dams. These modifications include the new turbine installation at Lower Baker and the FSC installations at Upper Baker and Lower Baker. Understanding the impacts of these projects on temperature and

DO is one of the objectives of the Water Quality Monitoring Plan required in Section 5.6 of this certification.

- 5) *Compliance Schedule:* A 10-year compliance schedule is provided for herein that focuses on meeting the water quality standards in the Lower Baker Tailrace and achieving the highest water quality conditions reasonably and feasibly attainable within the reservoirs and in the Upper Baker Tailrace. Throughout the ten-year compliance schedule, compliance with temperature and DO standards shall be maintained in the Lower Baker Tailrace to the extent reasonable and feasible.
- 6) *Water Quality Attainment Plan:* PSE shall develop a Water Quality Attainment Plan (WQAP) that, in accordance with WAC 173-201A-510(5), provides a detailed strategy for maintaining the highest attainable water quality condition to best protect the biota with respect to temperature and DO that is reasonable and feasible to achieve in the reservoirs and tailraces. The WQAP shall identify and evaluate potential reasonable and feasible operational and structural changes to improve temperature and DO in the reservoirs and tailraces. Any operational or structural change that conflicts with other conditions of this certification requires prior approval by Ecology. The WQAP shall also identify the temperature and DO regime that is reasonably and feasibly achievable based upon such evaluation, such that the temperature and DO in the discharge from each dam is maintained to the highest extent reasonable and feasible. It is recognized that a trade-off between these two parameters may be required (i.e., discharging the preferred cooler waters from deep in a reservoir may result in DO deficiency downstream). Thus, when it is not feasible to meet both the temperature and dissolved oxygen criteria at the same time, the intent is to find the balance where biological protection would be optimized.

A Responsiveness Summary shall be incorporated into the WQAP that evaluates the effectiveness of the modifications, if any, and identifies follow-up studies and actions that can be performed to further improve temperature and DO concentrations based on the initial findings.

A draft of the WQAP shall be submitted to an advisory committee consisting of Ecology, the ARG, and any interested member of the public for comment within a year after completing the three major modifications listed above, or within 8 years of license issuance, whichever comes first. The draft shall include DO and temperature data collected during normal operation with the new Lower Baker turbines and both FSCs to the extent possible. The final WQAP shall include the comments and responses of PSE and must obtain Ecology approval. The WQAP must include a schedule for carrying out an adaptive process for evaluating feasible and reasonable technical and operational changes that will improve water quality protection within 10 years of license issuance.

- 7) *Post-Compliance Schedule:* If implementing the compliance schedule and adaptive management strategy does not result in compliance with water quality standards at the time the compliance schedule expires, PSE may explore other alternative approaches available in the water quality standards, including a second compliance schedule or other approaches that could include modification of the water quality standards. Ecology urges PSE to work closely with Ecology if this eventuality arises.

## **5.6 MONITORING AND REPORTING**

- 1) *Water Quality Monitoring Plan.* Water quality shall be monitored as detailed in the Water Quality Monitoring Plan to be prepared by PSE within six (6) months of license issuance and approved by Ecology. Water quality measurements shall be made for the parameters listed in Table 2 at the identified locations and frequencies.

**Table 2. Water Quality Monitoring Schedule**

Parameter	Location	Depths (ft)	Frequency
Flow	Upper Baker Tailrace	—	Hourly
	Lower Baker River	—	15 minutes <sup>1</sup>
Total Dissolved Gas (TDG)	Baker Lake Forebay, B-19	—	No monitoring
	Upper Baker Tailrace, UB-TR	> 7	Spill events: As required in the TDG Abatement Plan
	Lake Shannon Forebay, SH-A	—	No monitoring
	Lower Baker Adult Fish Trap, FT	> 7	New turbine characterization: Hourly from one month before until a minimum of 3 months after installation Spill events: As required in the TDG Abatement Plan
Temperature <sup>2</sup>	Baker Lake Forebay, B-19	1, 40, 80, 120, ~200	May 1–Oct 31: Hourly
	Upper Baker Tailrace, UB-TR	~1	May 1–Oct 31: Hourly
	Lake Shannon Forebay, SH-A	1, 40, 80, 120, ~200	May 1–Oct 31: Hourly
	Adult Fish Trap, FT	~10	May 1–Oct 31: Hourly
Turbidity	Baker Lake Forebay, B-19	surface	During drawdown <sup>3</sup> : Weekly
	Upper Baker Tailrace, UB-TR	surface	During drawdown <sup>3</sup> : Weekly
	Lake Shannon Forebay, SH-A	surface	During drawdown <sup>3</sup> : Weekly
	Lower Baker Adult Fish Trap, FT	surface	During drawdown <sup>3</sup> : Weekly Background characterization monitoring
Dissolved Oxygen <sup>4</sup>	Baker Lake Forebay, B-19	Every 20' from 0'–~200'	1 time characterization May 1–Oct 31: Monthly @ all depths, twice daily (early morning and late afternoon) 1 time characterization Nov 1–April 30: Monthly @ single depth
	Upper Baker Tailrace, UB-TR	surface	Monthly, early morning
	Lake Shannon Forebay, SH-A	Every 20' from 0'–~200'	1 time characterization May 1–Oct 31: Monthly @ all depths, twice daily (early morning and late afternoon) 1 time characterization Nov 1–April 30: Monthly @ single depth
	Lower Baker Adult Fish Trap, FT	~10	Monthly, early morning
Oil & Grease	Lower Baker Adult Fish Trap, FT	~1	Monthly

<sup>1</sup> Lower Baker River flow can be determined using data from USGS Station 12193500.

<sup>2</sup> Temperature monitoring shall begin 1 year prior to any project expected to have temperature impacts (e.g. FSC installations at upper and lower dams, new turbine installation). Monitoring shall continue at frequencies outlined above until a monitoring reduction is agreed upon by PSE and Ecology.

<sup>3</sup> Drawdown monitoring is triggered when reservoir elevations are within 5 feet of target elevations; monitoring shall continue for 30 days after reservoir levels are 5 feet above target elevations. Target elevations are 685' and 389' for Baker Lake and Lake Shannon, respectively.

<sup>4</sup> DO monitoring shall begin 1 year prior to any project expected to have DO impacts (e.g. FSC installations at upper and lower dams, new turbine installation). Monitoring shall continue at frequencies outlined above until a monitoring reduction is agreed upon by PSE and Ecology.

The intention of this monitoring program is to assess the water quality impact of the overall Project, as well as the impact of smaller, embedded, projects that could potentially degrade water quality. These smaller projects include the FSCs at Upper and Lower Baker Dams and the new turbines at Lower Baker Dam. Any projects proposed in the future that could potentially degrade water quality will require a similar monitoring regiment to assure compliance with applicable water quality requirements.

- 2) *Annual Water Quality Report.* Water quality data shall be summarized and reported in a format approved by Ecology and submitted annually. The report shall include sample dates, times, locations, and results. Any violations of state water quality standards shall be highlighted. The report shall also discuss reservoir pool elevation data and the associated turbidity (required in Section 5.3 of this certification) and implementation of the Water Quality Protection Plan (required in Section 5.1 of this certification). The report shall be submitted by June 30<sup>th</sup> of the year following the collection of the data. Data reports shall be submitted to the hydropower certification manager at the Department of Ecology, Water Quality Program, Northwest Regional Office.

### **5.7 MODIFICATIONS TO MONITORING**

Modifications to the monitoring program can be requested by submitting to Ecology reasons for the modifications along with a modified Water Quality Monitoring Plan. Written approval must be received by Ecology before the modified plan can be implemented.

A more rigorous water quality sampling program for the listed parameters or additional parameters may be required by Ecology if necessary to protect water quality in the future based on monitoring results, regulatory changes, changes in Project operations, requirements of TMDLs, or to otherwise provide reasonable assurance of compliance with state water quality standards.

### **5.8 WATER QUALITY CRITERIA VIOLATIONS**

Any work that is out of compliance with the provisions of this certification, or Project-related conditions that result in distressed, dying or dead fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited. If these conditions occur, the applicant shall immediately take the following actions:

- a) Cease operations at the location of the violation to the extent such operations may be causing or contributing to the problem.
- b) Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.
- c) Observed violations of flow or observation of a sheen from petroleum products or of dying fish shall be reported to Ecology, Northwest Regional Office immediately or no later than 24 hours. PSE shall provide a written follow-up report to Ecology within two (2) weeks of the incident stating what occurred, whether the incident was due to natural events or human-related activities, PSE's response, any measures PSE proposes to reduce future similar occurrences, results of any samples taken, and any additional pertinent information.
- d) All other observed water quality violations shall be highlighted in the annual monitoring report (see Section 5.6, *Monitoring and Reporting*).

Compliance with these requirements does not relieve PSE from the responsibility to maintain continuous compliance with the terms and conditions of this certification or the resulting liability from failure to comply.

### **5.9 AQUATIC RIPARIAN HABITAT PROTECTION, RESTORATION AND ENHANCEMENT PLAN**

Within two years of license issuance, PSE shall develop and submit for Ecology approval an Aquatic Riparian Habitat Protection, Restoration and Enhancement Plan (ARP) for the purpose of identifying actions to protect and enhance low-elevation bottomland ecosystems in the Skagit River basin, which includes the Baker River sub basin, focusing on habitat for protection, acquisition, restoration and maintenance for anadromous salmonids, other aquatic species and riparian-dependent birds and amphibians.

PSE shall develop the ARP in consultation with the Terrestrial Resources Implementation Group (TRIG), the Aquatics Resources Group (ARG), and Ecology, specifically including the US Forest Service, Washington Dept. of Fish and Wildlife (WDFW), Washington Dept. of Natural Resources (WDNR), The Nature Conservancy, the Upper Skagit Indian Tribe, the Sauk-Suiattle Indian Tribe, and the Swinomish Indian Tribal Community. Within one year of license issuance, PSE shall submit a draft of the ARP to the TRIG and the ARG for review and comment. PSE shall include, with the ARP, an implementation schedule, documentation of consultation, copies of consulting entity comments and recommendations on the completed plan and schedule, and specific descriptions of how the entities' comments are accommodated by the plan and schedule. Prior to submitting the ARP to Ecology for its approval with or without modifications or remand for further development, PSE shall seek to obtain approval of the TRIG and ARG, and if approval of either for any part of the draft ARP is not obtained, provide detailed written explanation of the reasons for any such difference to Ecology.

The ARP shall be prepared based on the following criteria:

- a) Candidate sites shall be examined for their potential to provide long-term benefits. Implementation proposals shall be based on a comparison of the predicted benefits arising at a specific site in relation to the costs of the action or actions proposed for the site, with the same factors for other sites with similar potential, based on a reasonable range of options for alternative sites;
- b) The location of sites for the purposes of implementation shall be used to aid in prioritizing locations in the following order: i) within the Baker River basin, ii) within the middle Skagit River and tributaries immediately downstream of the Baker River (from the confluence with the Baker River to the Pipeline Crossing at RM 24.3), iii) within the lower Skagit River and estuary, and iv) elsewhere in the Skagit River basin, or as may otherwise be established in the ARP;
- c) i) consideration of any potential to impair, diminish, or abrogate tribal treaty or cultural rights, by providing that PSE shall identify suitable alternative sites or management activities if the designated representative of any affected tribe notifies the TRIG, ARG, and Ecology of its conclusion that a particular site or management activity will impair, diminish, or abrogate specific tribal treaty or cultural rights and describes the basis for its conclusion; ii) consideration of the potential for integration of the site acquisition and management required by this article and other articles to optimize the resulting ecosystem benefits; iii) consideration of appropriate land acquisition costs; iv) consideration of the potential to secure grant funds to supplement the funds otherwise for implementation of this article; v) consideration of whether any sites so acquired are appropriately included in the Project boundary, and if so, provide for the filing of an appropriate request to the Commission; and vi) providing for continuing consultation with the TRIG, ARG, and Ecology in the implementation of the approved plan;
- d) the plan shall be structured to allow for flexibility in revising site selection criteria and reprioritizing types of habitat lands to be protected, acquired, restored and/or managed in response to changing needs and conditions over the term of the license;

- e) when considering land acquisition or management activities, evaluate the extent of required noxious weed management in accordance with criteria developed in Article 508 of the Baker River Hydroelectric Project Relicensing Comprehensive Settlement Agreement;
- f) to aid in the evaluation of a specific resource project and site selection proposed under the ARP, PSE shall provide information to the TRIG, ARG, and Ecology regarding any other resource projects being considered pursuant to other license article requirements similar to the project being considered, or that provide similar potential biological benefits and have the potential for integration with related enhancement actions; and
- g) monitoring needs.

In addition to these general guidelines, the ARP shall require that up to \$1,000,000 of the funds available for implementation of the ARP be expended within the Baker River watershed, as established in the ARP. For funds expended outside the Baker Basin, a minimum of 50% shall be spent on riverine/riparian habitat acquisition with anadromous fish benefits. A minimum of 50% of the funds so spent on riverine/riparian habitat shall be spent on habitat that benefits both anadromous species and deciduous forest/wetland species, unless otherwise agreed by the TRIG and ARG.

PSE shall provide funding for implementation of the ARP in a total amount not to exceed \$10,200,000, according to the following schedule for funding: \$50,000 available annually starting the first year following license issuance and concluding in the sixth year following license issuance for planning and site evaluation activities; \$300,000 available within two years following license issuance for initial protection, restoration, enhancement, and management activities; and \$2,000,000 available in each of years 3, 8, 13, and 18 following license issuance. To the extent such funding is required to carry out the ARP, PSE shall also contribute up to \$1,600,000 if phase two of Article 105 of the Baker River Hydroelectric Project Relicensing Comprehensive Settlement Agreement is not implemented.

For the purposes of this article, acquisition costs may include: transaction costs, such as completion of appropriate site assessments for hazardous materials and noxious weeds; land surveys, including timber cruise if needed; appraisals; habitat surveys; filing fees; excise taxes; title searches, reports, fees and insurance; closing costs; preparation of land acquisition agreements and any required governmental approvals. Acquisition costs may exclude: internal personnel and administrative costs of the parties associated with land acquisitions, such as staff salaries and benefits; attorney fees and other legal expenses incurred by PSE or any other party not related to the preparation of land acquisition agreement and any required government approvals; and fees paid by PSE to third parties for administrative costs associated with a third parties' acquisition of interests in land on behalf of PSE. Prior to completing any transaction, PSE will notify the TRIG and ARG, as appropriate, if it appears that transaction costs will be significantly higher than expected, and shall, in consultation with the TRIG and ARG, determine whether to proceed with a transaction with significant transaction costs.

If funds are available twenty-five years following license issuance, and PSE, in consultation with the TRIG and ARG, determines lands are not available and/or habitat enhancement or management actions are not feasible for any of the intended purposes of this article, the remaining funds required by this article may be made available to the Habitat Enhancement, Restoration and Conservation (HERC) Fund and/or Terrestrial Enhancement and Research Fund (TERF) as provided in the Settlement Agreement.

Without any limitation on any other reservation of authority provided in this certification, Ecology specifically reserves the right to modify any decision provided under this section insofar as necessary to comply with state water quality standards, including providing mitigation for harm or injury to existing or designated uses or violations or other applicable water quality standards.

### **5.10 CONSTRUCTION PROJECTS, MISCELLANEOUS DISCHARGES, AND HABITAT MODIFICATIONS**

The following applies to all in-water or near-water work related to the Project that can impact surface- or ground-water quality. This includes, but is not limited to, construction and maintenance of, or emergencies from, any of the following: fish collection structures, generation turbines, penstocks, hatcheries, transportation facilities, portable toilets, boat ramps, access roads, transmission corridors, structures, gravel augmentation projects, and staging areas for all Project-related activities.

If water quality exceedances are predicted as being unavoidable, a short-term modification must be applied for in writing to Ecology and WDFW at least three months prior to project initiation. If any project has a long-term impact on a regulated water quality parameter, characterization monitoring must be performed for the impacted parameter(s), and a monitoring plan must be outlined in the Water Quality Protection Plan discussed below.

#### *Water Quality Protection Plan (WQPP)*

A water quality protection plan (WQPP) shall be prepared, and followed, for all Project-related construction, maintenance and repair work that is in- or near-water that has the potential to impact surface- and/or groundwater quality. The plan shall include control measures to prevent contaminants from entering surface water and groundwaters, and shall include, but not be limited to, the following elements:

- 1) Stormwater Pollution Prevention Plan (SWPPP). The SWPPP shall specify the Best Management Practices (BMPs) and other control measures to prevent pollutants from entering the Project's surface water and groundwaters. The SWPPP shall address the pollution control measures for PSE's activities that could lead to the discharge of stormwater or other contaminated water from upland areas. The SWPPP should also specify the management of chemicals, hazardous materials and petroleum (spill prevention and containment procedures), including refueling procedures, the measures to take in the event of a spill, and reporting and training requirements. The SWPPP shall also specify water quality monitoring protocols and notification requirements.
- 2) In-Water-Work Protection Plan. The In-Water-Work Plan shall be consistent with the SWPPP and shall specifically address the BMPs and other control measures for PSE activities that require work within surface waters. In addition to construction activities, this work includes, but is not limited to, the application of herbicides, pesticides, fungicides, disinfectants, and lake fertilization. The Plan shall address water quality monitoring provisions for all in-water work, including monitoring outside the area that could be influenced by the work, and at the point of compliance throughout the project life.
- 3) The WQPP should include procedures for monitoring water quality and the actions to implement if a water quality exceedance were to occur, including procedures for reporting any water quality violations to Ecology. The WQPP shall include all water quality protection measures consistent with an HPA for the project.

The WQPP shall be submitted to Ecology for review and approval at least three (3) months prior to work initiation, and a copy of the WQPP shall be in the possession of the on-site construction manager, and available for review by Ecology staff, whenever construction work is under way.

#### *Best Management Practices for Construction Work*

WQPPs for construction work should include, at a minimum, the following BMPs:

- 1) All reasonable measures shall be taken to minimize the impact of any project on waters of the state. Water quality constituents of particular concern are turbidity, TSS, suspended sediment, oil and grease, and pH. BMPs shall be implemented to control erosion and sedimentation, to assure proper

use of chemicals, to prevent and control oil and chemical spills, and to properly dispose of surplus construction supplies and other solid wastes.

- 2) All necessary measures shall be taken to minimize the disturbance of existing riparian, wetland or upland vegetation.
- 3) All equipment shall be placed so that it cannot accidentally enter a waterway or cause water quality degradation to state waters.
- 4) Retention areas or swales shall be used to prevent discharging of water from construction areas.
- 5) PSE shall ensure that any fill materials placed for habitat improvements in any waters of the state do not, by reference to applicable standards, contain toxic materials in toxic amounts.

#### *Turbidity Standards for Construction Projects Work*

- 1) Certification of this project does not authorize PSE to exceed the turbidity standard during construction work beyond the mixing zone described below. Turbidity within the Project waters shall not exceed 5 NTU over background turbidity when turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
- 2) Consistent with WAC 173-201A-200(1)(e)(i), a mixing zone is established within which the turbidity standard is waived. The mixing zone is established to allow only temporary exceedances of the turbidity criteria during and immediately after in-water work. The temporary turbidity mixing zone shall be as follows:
  - a) For waters up to 10 cfs flow at the time of construction, the point of compliance shall be 100 feet downstream from activity causing the turbidity exceedance.
  - b) For waters above 10 cfs up to 100 cfs flow at the time of construction, the point of compliance shall be 200 feet downstream from activity causing the turbidity exceedance.
  - c) For waters above 100 cfs flow at the time of construction, the point of compliance shall be 300 feet downstream from activity causing the turbidity exceedance.
  - d) For in-water work within or along reservoirs, lakes, ponds, wetlands, or other non-flowing waters, the point of compliance shall be at a radius of 150 feet from the activity causing the turbidity exceedance.

#### **5.11 CONTAMINANT SPILL AND RELEASE PREVENTION AND CONTROL**

[In the context of this section, "spills" will refer to contaminant spills as opposed to the release of water from the hydroelectric project.]

No oil, fuel, or chemicals shall be discharged into state waters, or onto land with a potential for entry into state waters as prohibited by Chapter 90.56 RCW.

A Spill Prevention, Containment, and Countermeasure (SPCC) Plan must be prepared that covers, as applicable within the Clean Water Act, any equipment to be used at the site, including the powerhouse and any equipment associated with the powerhouse, that holds or contains oil, fuel, or chemicals that are potentially detrimental to water quality and the biota. The plan must be kept on site, in the possession of the person in charge at all times. The plan shall be submitted to Ecology for approval within one (1) year of license renewal. The plan must include, at a minimum, the following BMPs and spill response requirements.



*Best Management Practices:*

- 1) Care must be taken to prevent any petroleum products, paint, chemicals, or other harmful materials from entering waters of the state.
- 2) Visible floating oils released from construction or Project operation shall be immediately contained and removed from the water.
- 3) All oil, fuel or chemical storage tanks shall be diked and located on impervious surfaces so as to prevent spills from escaping to surface waters or ground waters of the state.
- 4) Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters. Refueling of equipment on land shall occur where there is no potential of spilling fuel into rivers, creeks, wetlands, or other waters of the state. Equipment that requires refueling in-water shall be maintained and operated to prevent any visible sheen from petroleum products from appearing on the water. Proper security shall be maintained to prevent vandalism.
- 5) Oil & grease usage should be regularly monitored. Observation of significant increase in usage should trigger an investigation for leaks, followed by any required maintenance or corrective action.
- 6) No emulsifiers or dispersants are to be used in waters of the state without prior approval from the Department of Ecology, Northwest Regional Office.
- 7) Wash water containing oils, grease, or other hazardous materials resulting from wash down of equipment or working areas shall be contained for proper disposal, and shall not be discharged into state waters.

*Spill and Release Response*

- 1) In the event of a discharge or release of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and clean-up efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Clean-up shall include proper disposal of any spilled material and used clean-up materials.
- 2) Water samples shall be collected and analyzed to assess the extent of the spill and to assure all contaminants have been thoroughly removed from the waterbody.
- 3) Spills into state waters, spills onto land with a potential for entry into state waters, or other significant water quality impacts, shall be reported immediately or no later than 24 hours after discovery to the Department of Ecology, Northwest Regional Office at 425-649-7000 (24-hour phone number). PSE shall provide a written follow-up report to Ecology within two (2) weeks of the incident stating what occurred, whether the incident was due to natural events or human-related activities, PSE's response, a plan detailing long-term corrective actions and monitoring protocols if needed, any measures PSE proposes to reduce future similar occurrences, results of any samples taken, and any additional pertinent information.
- 4) Compliance with this condition does not relieve PSE from responsibility to maintain continuous compliance with terms and conditions of this certification or resulting liability from further failure to comply.

Additional BMPs are listed in Appendix E of this certification; Ecology recommends that all applicable BMPs in Appendix E are included in the SPCC Plan.

### **5.12 HERBICIDE / PESTICIDE / FERTILIZER APPLICATIONS**

Prior to the use of herbicides, pesticides, fungicides, disinfectants, fertilizers, or algicides in or adjacent to waters of the state, coverage under a National Pollutant Discharge Elimination System (NPDES) Aquatic Pesticides Permit shall be obtained, and conformance with any other applicable state requirement such as SEPA, shall be attained.

In addition, BMPs and other control measures for the application of herbicides, pesticides, fungicides, disinfectants, fertilizers, or algicides must be addressed in the In-Water-Work Protection Plan. An appropriate water quality monitoring plan shall be developed prior to the application and implemented for all related work. Prior to the use of pesticides adjacent to waters of the state, PSE shall follow BMPs to avoid the entry of such materials into waters of the state. Applicable BMPs include, but are not limited to, such actions as hand application and avoiding drift of materials into the water.

### **5.13 LOWER BAKER POWERHOUSE MODIFICATIONS**

Modifications to the Lower Baker power plant as proposed would require a Water Quality Protection Plan due to the potential release of hazardous materials from old equipment at the site. This plan shall follow the WQPP requirements detailed in Section 5.10 and shall include adoption of best management practices.

Additionally, Ecology should be informed in advance of any action related to the Lower Baker Powerhouse that may significantly and adversely impact water quality.

*Environmental Analysis:* As required by FERC in Section 3 of the FEIS, the extent of contamination by hazardous materials should be determined prior to their disturbance through the preparation of a Phase I EA. If potentially hazardous materials are present, the removal of the original equipment should be conducted in a manner that prevents runoff or dispersal of contamination. PSE shall consult with Ecology to determine a preferred method for investigating the extent of contamination and discarding contaminated materials.

*Best Management Practices:* Appropriate best management practices shall be implemented to limit the possibility of introducing hazardous materials to or substantially increasing turbidity in the Lower Baker River.

### **5.14 HATCHERY OPERATION**

Hatcheries discharging at least thirty (30) days per calendar year and producing more than 20,000 pounds of fish per year, or feeding more than 5,000 pounds of fish food during any calendar month, must apply for the general NPDES hatchery permit. The hatcheries within the Baker River watershed do not meet this requirement at the writing of this certification, but the hatcheries shall comply with the BMPs and other requirements stated in the general NPDES hatchery permit as it exists now or in the future. These BMPs shall be included in the Fish Propagation Facilities Plan (FPFP) required by the Settlement Agreement.

### **5.15 INSPECTIONS AND ADMINISTRATION**

PSE shall allow Ecology and WDFW such access as necessary to inspect the Project operations, Project area, and Project records required by this certification in order to monitor compliance with the conditions of this certification.

Copies of this certification and associated permits, licenses, approvals, and other documents shall be kept on site and made readily available for reference by PSE staff, its contractors and consultants, and by Ecology and WDFW.

## 6.0 CERTIFICATION

Subject to the above conditions and in accordance with Section 401 of the Clean Water Act (33 USC 1341), RCW 90.48.260, and Chapter 173-201A WAC, certification is granted to PSE for the Baker River Hydroelectric Project.

## 7.0 ORDER

Any person who fails to comply with any provision of this Order shall be liable for a penalty of up to twenty thousands dollars per day under the Federal Clean Water Act and up to ten thousand dollars for each day of continuing noncompliance or such other amount as may be authorized under state law as exists now or may be amended during the term of the license.

## 8.0 APPEAL PROCESS

You have the right to appeal this Order to the Pollution Control Hearings Board. Pursuant to Chapter 43.21B RCW, your appeal must be filed with the Pollution Control Hearings Board, and served on the Department of Ecology within thirty (30) days of the date of your receipt of this document. To appeal this Order, your notice of appeal must contain a copy of the Ecology Order you are appealing.

Your appeal must be filed with:

The Pollution Control Hearings Board  
4224 – 6th Avenue SE, Rowe Six, Bldg. 2  
P.O. Box 40903  
Lacey, Washington 98504-0903

Your appeal must also be served on:

The Department of Ecology  
Appeals Coordinator  
P.O. Box 47608  
Olympia, Washington 98504-7608.

In addition, please send a copy of your appeal to:

Federal Permit Appeals Coordinator  
Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

*For additional information: Environmental Hearings Office Website: <http://www.eho.wa.gov>*

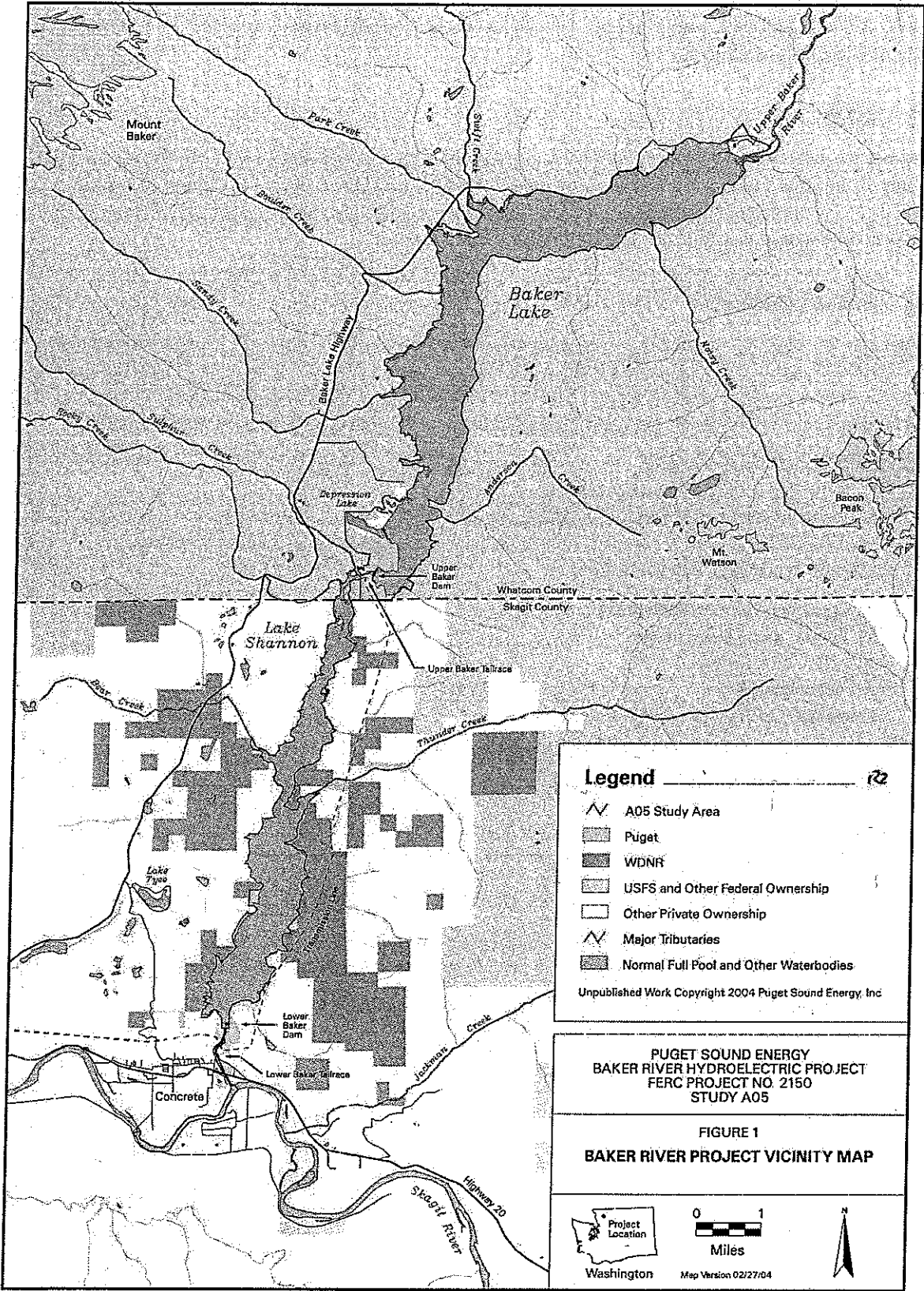
Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320. These procedures are consistent with Ch. 43.21B RCW.

DATED this tenth day of May 2007 at Bellevue, Washington.

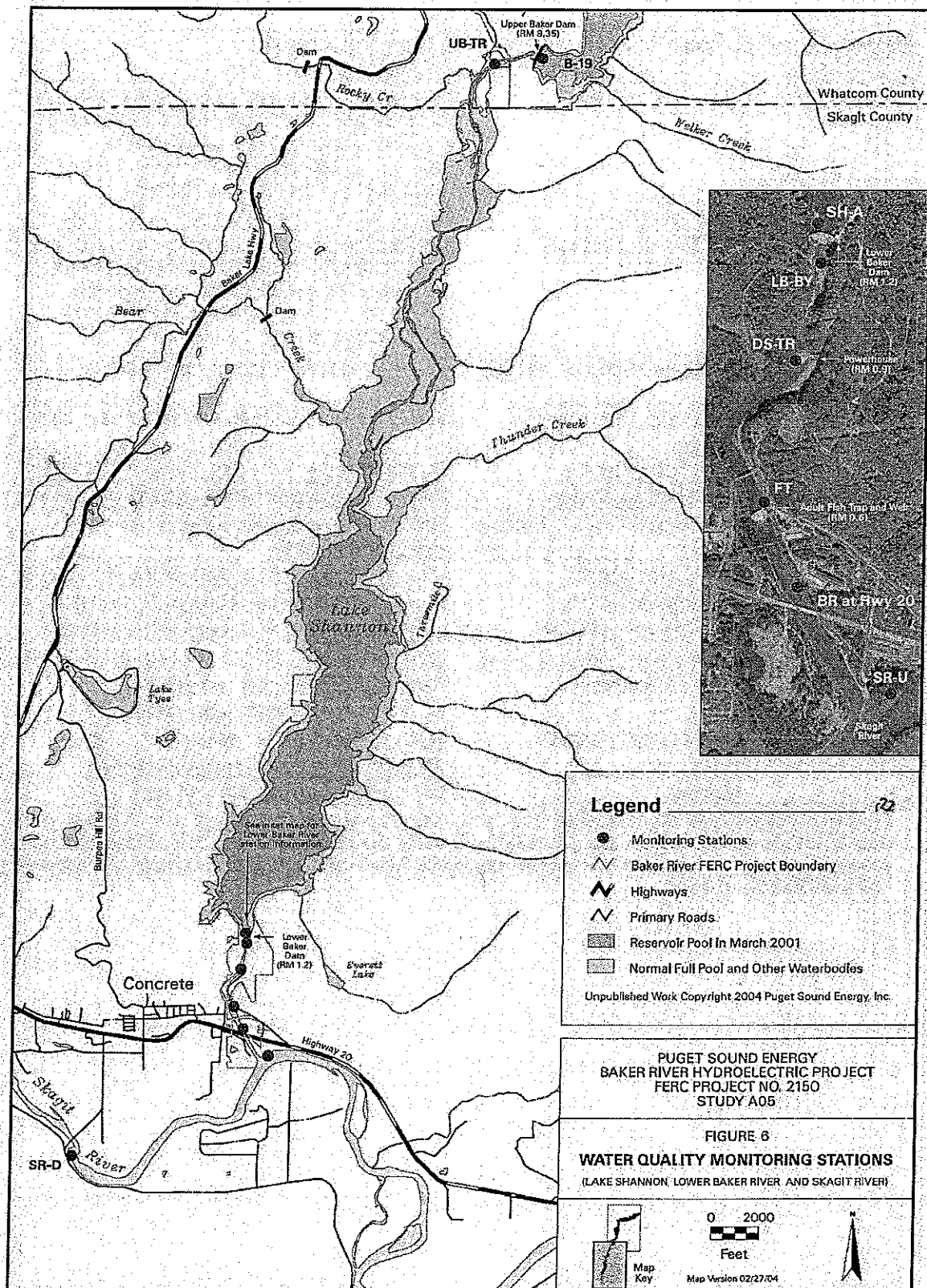


Kevin C. Fitzpatrick  
Water Quality Section Manager  
Northwest Regional Office  
Department of Ecology  
State of Washington

## Appendix A – Maps



Appendix A- Maps (continued)



**Appendix B – Existing Water Quality in the Baker System  
Study A05 Results (data from 2002-2004)**

Parameter	Location	Existing Water Quality (based on 2004 A05 WQ Study)
Temperature	Baker Lake, forebay	Temperature profile with depth - more stratified in summer months with bottom temperatures $\approx 7^{\circ}\text{C}$ and surface temperatures reaching $20^{\circ}\text{C}$ . Little or no stratification seen in winter months: bottom and surface temperatures $\approx 6^{\circ}\text{C}$ .
	Upper Baker Tailrace	Range: $\approx 3\text{--}5^{\circ}\text{C}$ in Feb/March to $\approx 16^{\circ}\text{C}$ in Sept
	Lake Shannon, forebay	Temperature profile with depth - more stratified in summer months with bottom temperatures $\approx 8^{\circ}\text{C}$ and surface temperatures approaching $20^{\circ}\text{C}$ . Little or no stratification seen in winter months: bottom and surface temperatures $\approx 7^{\circ}\text{C}$ .
	Lower Baker Tailrace - Fishtrap	Range: $\approx 4^{\circ}\text{C}$ in late February to $\approx 15.5^{\circ}\text{C}$ in Sept/Oct
TDG	Baker Lake, 10 ft deep in forebay	30 spot measurements show range of 93 - 108%
	Upper Baker Tailrace	12 spot measurements show range of 95 - 107%
	Lake Shannon, forebay	25 spot measurements show range of 92 - 104%
	Lower Baker Tailrace - Fishtrap	TDG exceedances occur during turbine ramp down and large spills.
Turbidity	Baker Lake, forebay	generally below 10 NTU, storm levels of 288 NTU
	Upper Baker Tailrace	31 measurements show range of 2 - 155 NTU
	Lake Shannon, forebay	generally below 10 NTU, storm levels of 66 NTU
	Lower Baker Tailrace - Fishtrap	generally below 15 NTU, storm levels of 250 NTU
DO*	Baker Lake, forebay	Surface: ave $\approx 10.5$ mg/L, range: 4-16 mg/L 32' depth: ave $\approx 10$ mg/L, range: 2-15 mg/L
	Lake Shannon, forebay	Surface: ave $\approx 10$ mg/L, range: 6-12.5 mg/L 32' depth: ave $\approx 10$ mg/L, range: 5-13 mg/L
	Fishtrap	DO $> 9.5$ mg/L, range: 9.5 - 14 mg/L

\* Dissolved oxygen data were obtained from a previous monitoring program prior to the A05 study. Quality assurance information was unavailable to verify the accuracy of the data. Some of the DO concentrations listed would not normally be associated with a reservoir with low biological productivity and are therefore, suspect.

## Appendix C – Application of Water Quality Standards to the Baker System

Effective December 21, 2006, Washington State revised the surface water quality standards (Chapter 173-201A WAC). Table C-1 summarizes the 2006 aquatic life designation uses for the waterbodies within the Project area. Table C-2 summarizes the applicable criteria for each waterbody.

[To the extent this Appendix C is inconsistent with the conditions set forth in the text of this certification, the conditions set forth in the text of this certification shall govern and control.]

**Table C-1. Waterbody Aquatic Life Use Designations**

Waterbody	Designation
Baker Lake and Tributaries	Char Spawning and Rearing
Upper Baker Tailrace down to the Skagit River confluence	Core Summer Salmonid Habitat

**Table C-2. Applicable 2006 criteria for each waterbody**

Parameter	Project Waterbody	Standard/Criteria to be met
Temperature	Baker Lake Upper Baker Tailrace Lake Shannon	Human actions considered cumulatively may not increase the 7-DADMax temperature more than 0.3°C above natural conditions. For this case, all reasonable and feasible measures must be taken to achieve conditions that best protect the designated uses.
	Lower Baker Tailrace	Core Summer Salmonid Habitat: 7-DADMax temperature not to exceed 16°C.
TDG	Baker Lake Upper Baker Tailrace Lake Shannon Lower Baker Tailrace	Not to exceed 110% of saturation at any point of sample collection. [Does not apply during 7Q10 flood]
Turbidity	Baker Lake Upper Baker Tailrace Lake Shannon Lower Baker Tailrace	Turbidity shall not exceed 5 NTU over background turbidity when background turbidity is 50 NTU or less, or have more than a 10 percent increase when background turbidity is more than 50 NTU.
DO	Baker Lake Upper Baker Tailrace Lake Shannon	Human actions considered cumulatively may not decrease the DO concentration more than 0.2 mg/L below natural conditions. For this case, all reasonable and feasible measures must be taken to achieve conditions that best protect the designated uses.
	Lower Baker Tailrace	Core Summer Salmonid Habitat: Lowest 1-day minimum = 9.5 mg/L.

### Appendix D – Submittal Requirements

The following submittals are requirements of this certification. Refer to the specified section for additional information. Unless indicated otherwise, submittals shall be sent to the permit manager at the Department of Ecology, Northwest Regional Office, Water Quality Section, 3190 160th Avenue SE, Bellevue, Washington 98008.

[To the extent this Appendix D is inconsistent with the conditions set forth in the text of this certification, the conditions set forth in the text of this certification shall govern and control.]

Section	Submittal	Frequency	First Submittal Date
5.1 General Requirements	Notification of Spill Events	As necessary	Within 24 hrs of event
5.1 General Requirements	Project Water Quality Protection Plan (WQPP)	Once, updated as necessary	Within 1 year of license issuance
5.2 Instream Flows and Ramping Rates	Flow Implementation Report	Annually	Within 2 years of license issuance
5.2 Instream Flows and Ramping Rates	Notification of Flow Violation	As necessary	Within 24 hrs of violation
5.3 Turbidity	Background Turbidity Concentration Report	Once	Within 3 years of license issuance
5.4 Total Dissolved Gas (TDG)	7Q10 Storm Event Size Determination	Once	Within 6 months of license issuance
5.4 Total Dissolved Gas (TDG)	TDG Abatement Plan	Once, updated as necessary	Within 1 year of license issuance
5.4 Total Dissolved Gas (TDG)	Compliance Feasibility Analysis	Once, updated as necessary	Within 7 years of license issuance
5.5 Temperature and Dissolved Oxygen	Water Quality Attainment Plan (WQAP)	Once, updated as necessary	Within 8 years of license issuance
5.6 Monitoring and Reporting	Water Quality Monitoring Plan	Once, updated as necessary	Within 6 months of license issuance
5.6 Monitoring and Reporting	Annual Water Quality Report	Annually	June 30 <sup>th</sup> following license issuance
0	Notification of WQ Violation	As necessary	Within 24 hrs of event
5.9 Aquatic Riparian Habitat Protection, Restoration and Enhancement Plan	Aquatic Riparian Habitat Protection, Restoration and Enhancement Plan ("ARP")	Once	Within 2 years of license issuance
5.10 Construction Projects, Miscellaneous Discharges, and Habitat Modifications	Construction Water Quality Protection Plan (WQPP)	As necessary	3 Months prior to construction projects
5.10 Construction Projects, Miscellaneous Discharges, and Habitat Modifications	Short-term modification	As necessary	3 Months prior to construction projects
5.11 Contaminant Spill and Release Prevention and Control	SPCC Plan	Once, updated as necessary	Within 1 year of license issuance
5.12 Herbicide / Pesticide / Fertilizer Applications	NPDES Aquatic Pesticide Permit	As necessary	60 days prior to application
5.13 Lower Baker Powerhouse Modifications	Phase I EA for Lower Baker Powerhouse Construction / WQPP	Once	
5.14 Hatchery Operation	NPDES Hatchery Permit	As necessary	180 days prior to planned activity



## Appendix E – Recommended SPCC Plan BMPs

### Spill Response

- a) Establish in agreement with the Department of Ecology, site oil spill cleanup material inventory and include an inventory list at each site. Project Operators and any staff required to respond to an oil spill must have input on the inventory levels, type, product brand and quality of the oil spill cleanup supplies maintained on site. Purchase good quality spill cleanup supplies.
- b) In the event of an oil spill, properly dispose of used/contaminated materials and oil and as soon as possible restock new supplies. Include records of proper disposal in the oil consumption records and keep copies of disposal records of contaminated cleanup supplies on-site for inspection.
- c) Ensure that operational work boats and trained boat operators are available at the project. Install mechanisms as appropriate to safely launch or lower work boats into areas where work boats would be deployed in the event of an oil spill.
- d) Install stair cases, permanent ladders, etc. allowing for oil spill response staff to safely reach areas anticipated that could, in the event of an oil spill, need to be accessed to deploy sorbent pads and boom materials.

### Oil-Water Separators (OWS)

- a) Have a maintenance plan for the OWS. This maintenance plan must include a process to periodically test the oil-stop valves and insure quality assurance that they will work as designed.
- b) OWS shall not include rain or other water run-off.
- c) Perform periodic and appropriate maintenance and inspection on a schedule to include cleaning of sediment.
- d) Clean and service the OWS in the event of an oil spill incident where oil is introduced into the OWS.
- e) Evaluate each OWS for inflows to account for a total transformer container failure during a major rain event to insure that oil would not be "washed through" the OWS during such an event.

### Transformers

- a) Transformer deck containment area surfaces must be impervious. Conduct periodic inspections and re-surfaced areas, fill cracks, caulk metal plate footings or otherwise ensure that containment areas will contain all spill fluids.
- b) Obtain pre-approval from Ecology before breaching containment areas for reasons other than containment area maintenance.
- c) Remove oil from transformers prior to moving them from the transformer containment area.
- d) Snowy or icy conditions require daily inspections of transformer deck containment area including an inspection of the drains leading to the OWS for freeze-up conditions. Inspect the condition of the transformers and the transformer cooling system to insure that water pipes do not break and cause an oil leak or spill. Water cooled transformers that are off-line must have the cooling systems properly secured at the time of transformer decommissioning, regardless of the season or time of year to insure that in the event of freezing weather, the cooling systems will not freeze-up and cause a transformer oil leak or spill. Remove any observed rain water pooling in the containment areas.
- e) Build covers over the transformer decks to prevent rain water and snow accumulation if it can be safely conducted.

### Sumps

- a) Locate oil sensors on the surface of the water in each sump in addition to the oil sensors located at the bottom of each pumping cycle. Inspect and test these sensors every 3-months or sooner if needed to insure that they will work as designed. Include in the inspection provisions to verify that the oil sensors located at the bottom of each pumping cycle are properly placed at the proper level. Visually inspect of these areas each week if oil is suspected to be present such as in the event of an oil sensor alarm or the observance of an oil or grease spill in the turbine pit of sufficient volume to reach the sump. Any oil detected in the sumps requires immediate EMD and NRC notification and cleanup.
- b) Immediately repair those oil leaks in the turbine pit that are of sufficient volume that can reach the sump and that can not be placed under a containment pan.
- c) Install hand rails and mechanisms so the sump covers can be removed for a visual inspection of the sump. Provide water-proof lighting in the sumps or spotlights adequate to view the surface water in the sumps. Provide a mechanism to satisfactorily deploy and recover sorbent boom in the sumps at each project.

- a) Provide proper containment around each storage container (including transformers) or around a combination of storage containers as appropriate and agreed upon by Ecology. Proper containment equals the volume of the container plus 10 per cent.
- b) Recalculate required containment areas to insure proper containment still exists after major equipment changes. Example: when converting from water cooled transformer to an air cooled unit, re-calculate oil volume and compare to containment area. Calculate containment volumes from *maximum* storage volumes, not normal oil level volumes.
- c) Provide external oil level gauges for governor oil tanks, transformers and other oil tanks that contain over 100-gallons of oil. Provide appropriate level markings for these gauges. Provide a sign or other means at each tank, near the tank level gauge, that describes these level markings and the relationship of each inch vs. how many gallons (in the case of a glass tube type of gauge). Dial gauges must also describe oil volume in gallons or have a sign or other means provided at each reservoir that adequately describes dial movement in relation to gallons. Provide a sign or other indication that shows  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and full gauge readings or indications in gallons. If equipment must be placed in a special mode of operation, prior to level observance, this must also be posted. Example: wicker gate ram position or other hydraulic ram positions, prior to oil level reading.
- d) Regularly check all fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc, for drips or leaks. Maintain and properly store them to prevent spills into state waters.
- e) Do not refuel equipment within 50 feet of rivers, creeks, wetlands, or other waters of the state.
- f) When working on transformers and other equipment that might spill or drip oil provide full oil spill containment capacity plus 10 per cent.
- g) Inspect containers once per week. Maintain container inspection sheets to include: maximum container volume and an exact reading recording of the oil level by the staff/operator conducting the inspection. Weekly inspection readings must be consistent; provide training to the staff/operator to ensure consistent and accurate readings.
- h) Keep oil consumption records maintained on-site; provide these records to the Department of Ecology immediately upon request.
- i) In the event that any Project modifies the oil transfer operation to include hard-plumbing to reservoirs such as the governor oil tank from the oil tank room, or other extensive modifications, Ecology notification and approval of such modification should be conducted.
- j) Contain wash water containing oils, grease, or other hazardous materials resulting from wash-down of equipment or working areas for proper disposal, and do not discharge this water into state waters.

**Other**

- a) Identify and map floor drains. Post these maps at the Project in a conspicuous location for use by Operators and other personnel in the event of an oil spill. Seal floor drains that are no-longer needed.
- b) Maintain site security at each Project site to reduce chance of oil spills.
- c) Keep SPCC Plans as required and historical spill records on-site. Provide these to Ecology immediately upon request.

## Appendix F – Acronyms and Definitions

[To the extent this Appendix is inconsistent with the conditions set forth in the text of this certification, the conditions set forth in the text of this certification shall govern and control ]

### Acronyms

7Q10 – 7-day, 10-year flow  
ARG – Aquatics Resources Working Group  
ARP – Aquatic Riparian Habitat Protection, Restoration and Enhancement Plan  
BMP – Best Management Practices  
BRCC – Baker River Coordinating Committee  
DO – Dissolved Oxygen  
FERC – Federal Energy Regulatory Commission  
FIP – Flow Implementation Plan  
FIR – Flow Implementation Report  
FPFP – Fish Propagation Facilities Plan  
FSC – Floating Surface Collector  
HPA – Hydraulic Project Approval  
IPP – Interim Protection Plan  
msl – mean sea level  
MW – megawatt  
NOAA – National Oceanic and Atmospheric Administration  
NPDES – National Pollutant Discharge Elimination System  
NTU – nephelometric turbidity unit  
NWRO – Ecology's Northwest Regional Office  
PSE – Puget Sound Energy  
RM – River Mile  
SEPA – State Environmental Policy Act  
SPCC – Spill Prevention Control and Counter measures  
SWPPP – Stormwater Pollution Prevention Plan  
TDG – Total dissolved gas  
TMDL – Total maximum daily load  
TRIG – Terrestrial Resources Implementation Group  
USDA-FS – United States Department of Agriculture – Forest Service  
USFWS – United States Fish and Wildlife Service  
USGS – United States Geological Survey  
WDFW – Washington Department of Fish and Wildlife  
WQAP – Water Quality Attainment Plan  
WQPP – Water Quality Protection Plan

### Definitions

**Adult Fish Trap** – The upstream trap and haul facility located on the Lower Baker Tailrace that is used to bring adult fish up to Baker Lake.

**Aquatic Resource Group** – A committee that will support the implementation of the new Baker River Project License. Representatives from four federal and three state agencies, Tribes, county, municipalities, citizen and environmental groups that signed the Settlement Agreement, in addition to PSE, function as the ARG. The ARG is convened on an ongoing basis to address Aquatics articles implementation throughout the term of the new license.

**Background** – the biological, chemical, and physical conditions of a water body, outside the area of influence of the discharge under consideration. Background sampling locations in an enforcement action would be up-gradient or outside the area of influence of the discharge. If several discharges to any water body exist, and enforcement action is being taken for possible violations to the standards, background sampling would be undertaken immediately up-gradient from each discharge.

**Baker Project waterbodies** – The surface waterbodies that are potentially directly affected by Project operation. These waterbodies include: Baker Lake, Lake Shannon, Upper Baker Tailrace, and Lower Baker Tailrace.

**Floating Surface Collectors** – The fish passage facilities in Baker Lake and Lake Shannon that are used to capture downstream migrating fish for later transport downstream of the Project

**Lower Baker Tailrace** – The portion of the Baker River between Lower Baker Dam and the Skagit River.

**Lower Baker Bypass Reach** – The portion of the Lower Baker Tailrace between Lower Baker Dam and the Lower Baker Powerhouse.

**Baker River Coordinating Committee (BRCC)** – The BRCC has been established by a comprehensive settlement agreement in support of implementing the new Baker River Project License. Representatives from each of the parties in the settlement, four federal and four state agencies, three Tribes, Skagit County, municipalities, citizen and environmental groups in addition to PSE, function as the BRCC. The BRCC is convened on an ongoing basis to address license article implementation throughout the term of the new license.

**Large storm event** – A storm event that would produce a 7Q10 flood flow in the Baker River as (as measured at the Baker River at Concrete Station (USGS Station 12193500).

**Live storage** – All water storage in a reservoir that can be used for release through the powerhouse. Also termed active storage.

**Natural conditions or natural background levels** – surface water quality that was present before any human-caused pollution. When estimating natural conditions in the headwaters of a disturbed watershed it may be necessary to use the less disturbed conditions of a neighboring or similar watershed as a reference condition.

**Pesticide** – a) Any substance or mixture of substances intended to prevent, destroy, control, repel, or mitigate any insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus on or in a living person or other animal which is normally considered to be a pest or which the director may declare to be a pest; b) Any substance or mixture of substances intended to be used as a plant regulator, defoliant or desiccant; and c) Any spray adjuvant, such as a wetting agent, spreading agent, deposit builder, adhesive, emulsifying agent, deflocculating agent, water modifier, or similar agent with or without toxic properties of its own intended to be used with any pesticide as an aid to the application or effect thereof, and sold in a package or container separate from that of the pesticide with which it is to be used. RCW – Revised Code of Washington

**Pollution** – such contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life.

**Puget Sound Energy** – The utility that owns and operates the Baker River Hydroelectric Project.

**Settlement Agreement** – The proposal that specifies protection, mitigation, and enhancement measures to allow PSE to continue to operate the Baker River Hydroelectric Project. The proposal was signed by 24 parties in the relicensing process.

**Short-term modification** – A permit, (as specified WAC 173-201A-410), granted by Ecology that allows the nonattainment of water quality standards on a short-term basis to accommodate essential activities, respond to emergencies, or to otherwise protect the public interest, even though such activities may result in a temporary reduction of water quality conditions

**TDG Abatement Plan** – The document that specifies the approach used for the Project to comply with TDG standards. The approach may include studies, monitoring, changes in operation, structural measures, and/or other recommendations to reduce TDG generated by the Project

**Water Quality Attainment Plan** – The document that specifies the approach to assess the reasonable and feasible alternatives that optimizes temperature and dissolved oxygen conditions within the Project's waterbodies

## Appendix G – References

R2 Resource Consultants, Inc., 2004. *Lower Baker River Habitat and Fish Use (Study A02)*, June. Prepared for PSE.

R2 Resource Consultants, Inc., 2004. *Hydrology and Geomorphology of the Baker and Middle Skagit Rivers (Study A-24), Part 1. Hydrology, Final Draft Report*, June. Prepared for PSE.

PSE, 2004. Baker River Project Relicense. FERC Project No. 2150. *Study A05 – Water Quality Final Study Report*. Prepared by HDR.

FERC, 2006. *Final Environmental Impact Statement, Baker River Hydroelectric Project, Washington (Project No. 2150)*.

U.S. Army Corps of Engineers (USACE). 2003. *2003 Draft Skagit River basin, Washington, revised flood insurance study. Hydrology summary*. U.S. Army Corps of Engineers, Seattle District, Seattle, Washington.

