



PUGET SOUND ENERGY
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LARGE WOODY DEBRIS MANAGEMENT PLAN SETTLEMENT AGREEMENT ARTICLE 109

BAKER RIVER HYDROELECTRIC PROJECT
FERC No. 2150



Puget Sound Energy
Bellevue, Washington

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Acronyms and Abbreviations

This abbreviation, acronym, or short name	Refers to
ARG	Aquatic Resource Group
FERC	Federal Energy Regulatory Commission
Ecology	Washington State Department of Ecology
GIS	Geographic information system
HPA	Hydraulic Project Approval
LWD	Large woody debris
LWDMP	Large Woody Debris Management Plan
NAVD 88	North American Vertical Datum. Unless specifically noted, all elevations refer to the GIS-based datum of 1988.
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
PSE	Puget Sound Energy, Inc.
TRIG	Terrestrial Resources Implementation Group
USDA-FS	United States Department of Agriculture- Forest Service
USFWS	United States Fish and Wildlife Service
WDFW	Washington State Department of Fish and Wildlife
WA DNR	Washington Department of Natural Resources



1.0 Executive Summary

This Large Woody Debris Management Plan (LWDMP) is prepared for the Baker River Hydroelectric Project (FERC Project No. 2150) (Baker Project) pursuant to the *Order on Offer of Settlement, Issuing New License and Dismissing Amendment Application as Moot* dated October 17, 2008 (License). Specifically, settlement agreement article 109 (SA 109) “Large Woody Debris” at Appendix A of the license provides for the transport of large woody debris (LWD) from project reservoirs to stockpile areas in the Baker River basin. Implementation of the LWDMP involves collection, enumeration, transport, and temporary storage of wood. Transport and use of the wood from the stockpile areas is beyond the scope of the LWDMP.

2.0 Introduction

2.1 Overview

The Baker River Project consists of the Lower Baker Development completed in 1925, and the Upper Baker Development completed in 1959 (figure 1). The Project includes facilities located on and adjacent to the Baker River, occupying about 5,200 acres of land within the Mt. Baker-Snoqualmie Forest. The Lower Baker Dam forms Lake Shannon and is located near Concrete, Washington, near the confluence of the Baker and Skagit rivers. Lake Shannon is approximately seven miles long and covers about 2,278 acres at full pool. The Upper Baker Dam forms Baker Lake, located in Whatcom County near the border with Skagit County. Baker Lake is approximately nine miles long and covers about 4,980 acres at full pool. The two existing hydroelectric facilities have been operating at a combined capacity of about 170 megawatts.

Continued operation of the Baker River Hydroelectric Project affects the downstream transport and storage of wood and other vegetative material through the Baker River. Wood entering a stream provides an important link in naturally functioning river systems. Once in the stream channel, LWD provides sediment storage sites, increases habitat diversity and complexity, serves as long-term nutrient storage and substrate for aquatic invertebrates, and provides refuge areas for aquatic organisms during flow events. Wood entering a river system is subject to decay and breakage, and is eventually transported to downstream reaches.

In January 2002, as part of studies conducted in support of relicensing of the Baker River Project, the USDA-FS requested that the Aquatic Resources Working Group conduct a study to estimate project effects on the recruitment and downstream transport of LWD in the Baker River. The intent of the study was to provide background information that could be used to develop a management plan that could be implemented under the new license. The primary conclusions of the LWD study prepared by R2 Resource Consultants (2003) are summarized below:

- The prevailing south wind in the Baker River basin generally restricts the downriver transport of LWD through Baker Lake and Lake Shannon. Many of the larger wood pieces entering the reservoirs become lodged along the reservoir shoreline.
- Accumulations of LWD (circa 1999) are located at the northern ends of both Baker Lake and Lake Shannon and are stranded above the maximum pool elevation.
- Wood fragments and pieces of LWD small enough to pass through the spill bays are generally allowed to pass freely over the dams during periods of spill; pieces of LWD that reach the forebay but are considered too large to easily pass through the spill bays have been collected at log booms in the forebay of each dam and then towed to the shore and removed from the lake.
- No records exist describing the volume of LWD removed from the lake, but interviews with project operators suggest that while the average annual amount is small, large volumes may occur in response to major flood events and may represent a 10-fold increase over the average annual volume.
- A wood recruitment model was developed to predict the average annual volume of LWD moving into the reservoirs. The LWD budget estimates that on average, an estimated 773 pieces of LWD enter the system each year (270 pieces from the Upper Baker River and tributary streams and 503 pieces from reservoir shoreline riparian areas).
- Accounting for in-channel storage and decay, the results of the LWD budget suggest that by year 40 in the absence of the project, an average of 183 pieces of LWD larger than 12 inches in diameter would be annually transported to the Skagit River.

The results of the 2003 analysis were used to support LWD transport targets included in SA 109. This LWDMP describes the steps the Puget Sound Energy will take to meet the requirements of SA 109. This LWDMP was prepared and reviewed in consultation with the Baker River Project Aquatic Resource Group (ARG) and the Terrestrial Resources Implementation Group (TRIG), which include representatives from Puget Sound Energy (PSE) and other signatories to the settlement agreement.

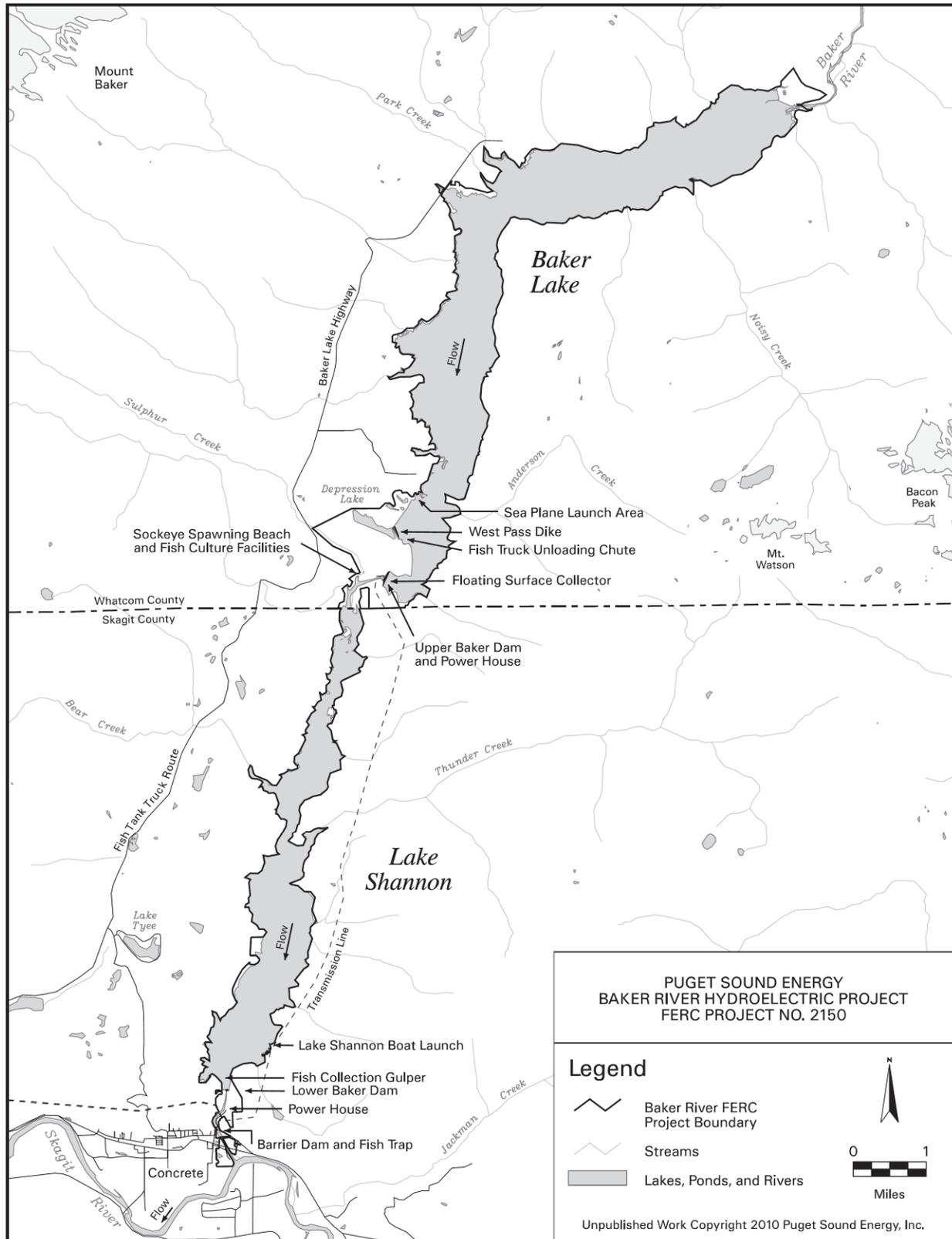


Figure 1. Baker River Hydroelectric Project, Concrete, Washington.

3.0 Basis for the Plan

SA 109 was developed to provide for the reasonable transport of LWD from project reservoirs to mutually agreeable stockpile areas in the Baker basin. This LWDMP has been prepared in response to SA 109, which is provided in its entirety below.

3.1 SA 109 – Large Woody Debris

Settlement agreement article 109, “Large Woody Debris” states:

“Within two years of license issuance, or on an alternative schedule submitted to the Commission for approval, the licensee shall develop and file with the Commission for approval a Large Woody Debris Management Plan (LWDMP). The LWDMP shall provide for the reasonable transport of large woody debris (wood over 12 inches (30 cm) in diameter and over 8 feet (244 cm) long) from Project reservoirs to mutually agreeable stockpile areas in the Baker basin to be identified in the plan. The plan shall identify the following 20-year targets for transport: 1) 2,960 pieces 30-60 cm diameter, 2) 540 pieces 60-90 cm diameter, and 3) 160 pieces greater than 90 cm diameter. The plan shall set forth specific annual transport requirements that will allow licensee to achieve the 20-year targets if LWD is available. Licensee’s obligation shall not extend to security of the stockpiled LWD, unless located on Project lands. The plan shall establish (i) wood transfer quantities for the first twenty years of the license term and (ii) a formula for reconfiguring the quantities relating to size and piece number allocation within the period after the first twenty years that is based on actual LWD accumulation over the first twenty years of the license. The plan shall include an implementation schedule.

The licensee shall develop the LWDMP after consultation with the ARG and Terrestrial Resources Implementation Group (TRIG). The licensee shall allow a minimum of 60 days for the consulted entities to comment and to make recommendations before filing the plan with the Commission. The licensee shall include with the plan, documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the ARG and TRIG, and specific descriptions of how the ARG and TRIG comments are accommodated by the plan. If the licensee does not accept a recommendation, the filing shall include the licensee’s reasons, based on Project-specific information.

If licensee needs to submit an alternative schedule to the Commission, licensee shall prepare the schedule in consultation with the ARG. Licensee shall provide a copy of the proposed alternative schedule to the ARG at least 30 days prior to submitting the alternative schedule to the Commission, and shall forward any comments on the alternative schedule to the Commission along with the proposed alternative schedule. Upon approval, the alternative schedule becomes a requirement under the license, and the licensee shall implement the alternative schedule, including any changes required by the Commission.”

3.2 Relationship to Other Articles of the License and Settlement Agreement

The FERC license and settlement agreement refer to the LWDMP in several other articles. Under SA 102, PSE will provide an annual report to the Parties per the schedule in SA 102 for 30 day review that includes a description of how PSE, agencies, and tribes coordinated the implementation of SA 109. Activities conducted during the previous 12

months (January 1 to December 31) and the status of development or implementation of measures will be summarized in each annual report.

The FERC license also includes Article 403 *Large Woody Debris*:

“The licensee shall incorporate into the large woody debris management plan required by Settlement Agreement article 109 in Appendix of this license, the following measures: (1) the licensee shall identify its responsibilities for managing large woody debris and, (2) the licensee shall identify the location of all large woody debris stockpile sites. The licensee shall include all large woody debris stockpile sites in the project boundary.”

The FERC license included as Appendix G, the NOAA Fisheries Biological Opinion Terms and Conditions. Reasonable and Prudent Measure (RPM) No. 7 called for the licensee to:

“Develop the LWDMP as described in Article 109 to improve juvenile salmonid rearing habitat.” The corresponding Terms and Conditions No. 7 identified:

“To implement RPM #7, the Licensee must develop the LWDMP as described in proposed Article 109.”

4.0 Goals

The goal of the LWDMP is to collect LWD that enters and is trapped within Baker Lake and Lake Shannon and transport the LWD to stockpile areas. The assumption is that LWD that is collected and stockpiled can be put to better use than allowing it to remain trapped within the reservoirs. Stockpiled wood will be available for use as directed by the ARG and TRIG.

4.1 Key Elements of SA 109

Implementation of SA 109 involves the following key elements:

- Develop criteria to identify LWD available for removal and transport, and a method of collecting the available LWD;
- Collect, remove, and transport LWD from Baker Lake and Lake Shannon;
- Stockpile the LWD in Baker River basin areas;
- Quantify the number and size of stockpiled wood pieces;
- Compare the quantity of wood transferred in post-Licensing year 1 through 20 against the 20-year target, and reconfigure target quantities for years 21-50 of the license term if necessary;
- Identification of PSE responsibilities to manage LWD (per LA 403); and
- Identification of LWD stockpile site (per LA 403).

5.0 Regulatory Reference and Definitions

The LWDMP has been developed and will be implemented in a manner consistent with applicable local state and federal laws and regulations. If conflicts exist between the objectives or management guidelines of this LWDMP and any applicable law or regulation, the objectives and guidelines will be followed to the extent possible while still complying with the law or regulation.

5.1 Federal Authority and Reference

The LWDMP is prepared according to the authority under the license. The license incorporates U.S. Department of Interior, USFWS and U.S. Department of Commerce, NOAA Fisheries conditions under Section 7 of the Endangered Species Act.

5.2 Washington State Authority and Reference

Activities conducted within “shorelines of the state” (non-federal lands within 200 feet of lakes of 20 acres or more and streams with an average annual flow of 20 cubic feet per second [cfs] or more) are subject to review and approval under the Washington State Shoreline Management Act and pertinent county and city shoreline management master programs. The shorelines of the Baker River, and larger tributary streams fall under the jurisdiction of the Shoreline Management Act. Removal of LWD from reservoir shorelines may require formal approval under the Shoreline Management Act.

The Washington State Hydraulic Code (RCW 77.55) requires the issuance of a hydraulic project approval (HPA) from WDFW for any activity that will use, divert, obstruct, or change the bed of a water of the state. State waters include all fresh waters, except those watercourses that are entirely artificial such as irrigation ditches, canals, and storm water run-off devices. Most management activities that will occur in aquatic habitats, including removal of LWD along reservoir shorelines will require an HPA.

The license incorporates requirements by Washington State Department of Ecology under Section 401(a)(1) of the Clean Water Act, including preparation of a Water Quality Protection Plan. LWD removal activities will be designed to minimize the effect on waters of the U.S.

5.3 Definitions

A list of acronyms, abbreviations, and short names is provided following the table of contents.

6.0 Plan Implementation

This section outlines specific components of the LWDMP as defined in SA 109.

6.1 Plan Area

The Baker River watershed, which is U.S. Geological Survey Hydrologic Unit Code 17110005 (Upper Skagit), encompasses the plan area for SA 109. The plan area includes Baker Lake and Lake Shannon, and stockpile areas used to temporarily store LWD removed from the Project reservoirs.

This plan applies to LWD deposited within two feet of the full pool level of Baker Lake and Lake Shannon. The normal Baker Lake full pool is within elevation 727.77 feet, mean sea level (NAVD 88); the normal Lake Shannon full pool is within elevation of 442.35 feet, mean sea level (NAVD 88). In response to FERC Article 403, PSE will include all LWD stockpile lands managed under SA 109 within the project boundary.

6.2 Rationale

Continued operation of the Baker River Hydroelectric Project affects the downstream transport and storage of wood through the Baker River. Wood entering a stream

provides an important link in naturally functioning river systems. This LWDMP provides for the transport of LWD from project reservoirs to mutually agreeable stockpile areas within the Baker River basin. The stockpiled wood will be made available for use in habitat improvement and protection projects.

The LWDMP is based on the assumption that LWD removed from the reservoirs will have greater natural resource value if made available for habitat improvement projects than if allowed to remain and accumulate in the reservoirs. Stockpiled wood is intended for use in habitat restoration or protection projects but removal and use of the LWD from the stockpile area is beyond the scope of SA 109. PSE's commitment under SA 109 is limited to the collection, enumeration, transport, and temporary stockpiling of LWD.

6.3 Funding

PSE will fund implementation of the LWDMP. Once wood recovered from the reservoirs is stockpiled at the storage sites, further use of the wood is beyond the requirements of SA109. Any costs associated with use or transport of the stockpiled wood outside of the stockpile areas are beyond the scope of the LWDMP.

6.4 Development and Modification of the Large Woody Debris Management Plan

The licensee has prepared the LWDMP in consultation with the ARG and the TRIG. Consulted parties were provided a minimum of 60 days to comment and to make recommendations on the draft plan. Documentation of consultation and copies of comments and recommendations on the draft LWDMP are provided in section 9 of this report. Any recommendations not accepted by PSE have been identified, along with the licensee's reasons based on Project-specific information. During performance of the LWDMP, site conditions may warrant modifications to the FERC-approved plan. If required, future modifications to the LWDMP will be made following the decision-making process outlined in SA 601.

6.5 Procedures, Standards, and Criteria

SA 109 provides for the transport of LWD from Baker Lake and Lake Shannon to stockpile areas. For the purposes of the LWDMP, wood to be transferred to stockpile areas will be over 12 inches (30 cm) in diameter and over 8 feet (244 cm) long.

The transport target by the end of license year 20 is 3,660 pieces of LWD consisting of:

- 2,960 pieces of LWD 12-23.6 in (30-60 cm) diameter;
- 540 pieces of LWD 23.7-35.4 in (61-90 cm) diameter; and
- 160 pieces greater than 35.4 in (>90 cm) diameter.

This 20-year transport target is equivalent to an annual average of 183 pieces of LWD. An estimated 773 pieces of LWD are annually delivered to the reservoirs from all sources (R2 2003). However, recruitment of LWD to the reservoirs will vary considerably from year to year depending on the frequency and magnitude of storm events. Elements of the SA 109 implementation process are described in greater detail in the following sections.

6.5.1 Identify LWD Available for Removal

An initial step in implementing the LWDMP is to validate the procedure for identifying LWD that is available for collection and transport. The LWD transport rates identified in pre-licensing Study A-20 (R2 2003) were based on theoretical modeling and estimated the total amount of LWD that enters the reservoirs. However, some LWD that enters the reservoirs may provide environmental benefit if left within the reservoir. Large trees along the reservoir shoreline riparian zone that fall into the reservoir will not be removed if their rootball rests more than a couple of feet above the full pool elevation and prevents the wood from floating away. Some LWD that settles along the reservoir shoreline may provide habitat for snag and log dependent species and provide greater ecological benefit remaining in place rather than being removed and stockpiled. LWD that is identified by the ARG or the TRIG as providing in-place environmental benefits will be marked for identification and included in the count of stockpiled LWD.

Some LWD that enters Baker Lake and Lake Shannon may pass over the dams through spillways. LWD that passes over Upper Baker Dam may accumulate in Lake Shannon and be available for removal, but LWD that passes over Lower Baker Dam will enter the Skagit River. Although LWD passing over Lower Baker Dam and entering the Skagit River provides ecological benefit, it would be difficult to accurately quantify the size and number of LWD pieces that pass downstream over Lower Baker Dam during flood events. LWD that is flushed downstream over Lower Baker Dam or sinks to the bottom of the reservoirs will not be included in the count of stockpiled LWD.

LWD that settles in depositional areas of the reservoirs may become mired in soft substrates and be difficult to remove. Since the removal and stockpiling of LWD is intended to enhance environmental conditions, some LWD pieces may not be collected if they cannot be removed without undue disturbance to the shoreline. LWD that cannot be removed due to siltation or other reasons, but has not been identified by the ARG or TRIG as providing in-place environmental benefit will be identified as part of the long term LWD accumulation (see section 6.5.4). PSE will consult with the USDA-FS prior to LWD collection activities at USDA-FS shoreline recreation sites and include the results of such consultation in the annual report

6.5.2 Collect and Transport LWD

Methods to collect and remove the LWD will be developed to minimize impacts of removal on other resources while allowing for efficient and effective LWD collection. Anecdotal information suggests that some LWD floats downstream to the log booms in the forebay of each dam during major storm events. However, large floating rafts composed of logs and woody debris are typically observed at the upstream end of each reservoir. During the late spring refill period, it may be efficient to collect and consolidate floating pieces of wood when the reservoir reaches full pool conditions. LWD could then be corralled within identified collection areas and removed after the reservoir pool level drops. PSE has tentatively identified the sea plane launch area within Baker Lake and a cove near the Lake Shannon boat launch (see figure 1) as staging areas where LWD can be corralled and cordoned behind log booms.

PSE will conduct the initial collection, transporting, and stockpiling of LWD within one year of FERC approval of the LWDMP. LWD collection and stockpiling activities will occur at least every 3 years in response to the episodic nature of LWD recruitment.

Procedures for the collection and removal of LWD will be reviewed by the ARG and the TRIG as part of the SA 601 approval process. PSE will record the number, size, species and condition of LWD pieces transported to the stockpile sites. Documentation of the LWD collection and transport procedures will be provided to the FERC as part of annual reporting requirements described in SA 102 Aquatics Reporting.

6.5.3 Stockpile and Inventory LWD

LWD that is removed from Baker Lake and Lake Shannon will be stockpiled in ARG and TRIG-approved locations where the wood can be accessed and removed. The majority of LWD recruitment to the reservoir is expected to occur during winter storm events and the stockpile areas must be large enough to store up to half of the 20-year target volume of LWD. Stockpile locations must provide sufficient space for operation of equipment used to transport wood to and from the site. Suitable sites will be reviewed with PSE operations staff to confirm use of the sites does not interfere with management activities or other proposed uses. The location of proposed stockpile areas will be provided to the ARG and TRIG for review and comment within one year of FERC approval of the LWDMP. Documentation of the results of the stockpile area selection process will be provided to the FERC as part of annual reporting requirements described in SA 102 Aquatics Reporting. The selected stockpile sites will be included in the project boundary as required by license article 403.

The LWD stockpile areas will be inventoried each year to record the number, size, species and condition of LWD available for use. The stockpile inventory will be provided to the FERC as part of annual reporting requirements described in SA 102 Aquatics Reporting.

PSE will maintain a separate tally of the number and size of LWD pieces transported to the stockpile sites that will count towards the 20 Year target. PSE will also record the number, size and location of LWD allowed to remain within the reservoirs to provide in-place environmental benefits. LWD pieces that remain in place at the request of the ARG or TRIG will count towards the Year 20 target of stockpiled LWD.

6.5.4 Formula for Reconfiguring Year 21-50 LWD Transport Target

Target LWD transport rates identified as part of pre-licensing Study A-20 (R2 2003) were based on the vegetative characteristics of Baker Lake and Lake Shannon shorelines and lower tributary riparian areas, river channel LWD transport and storage, and estimates of LWD recruitment observed in other reservoir and riverine systems. Target transport values specified in SA 109 considered estimates of annual LWD recruitment to the Skagit River after 40 years of “without” project conditions (R2 2003). While the estimates appear reasonable when compared to observations of LWD recruitment at other project reservoirs, the accuracy of the “without” project condition is uncertain.

LWD recruitment is expected to be episodic with few LWD pieces entering the reservoirs in some years and large amounts of LWD entering in other years. SA 109 acknowledges the variability in annual LWD recruitment and thus specifies that the target transport rate be met over a long-term (20-year average) rather than on an annual basis. SA 109 also requires that a formula be established for reconfiguring the quantities relating to size and piece number allocation within the period after the first twenty years based on actual LWD accumulation. LWD availability will be evaluated using aerial

imagery to quantify the change in LWD accumulations within the reservoirs over time. As part of pre-licensing study A-20 (R2 2003), photo sets taken at approximate 10-year intervals from 1940 to 1999 were used to identify changes in LWD accumulations in the reservoirs. Only those accumulations of LWD exceeding a minimum size of 1,024 square meters (approximately 0.25 acre) were mapped to ensure positive identification and accurate measurement of accumulations. Three 0.25 acre sample plots were surveyed to identify the average number and size of LWD pieces in LWD accumulations. The 0.25 acre sample plots had an average volume of 3,969 ft³ (112 m³), which is equivalent to 107 pieces of LWD (86 pieces of LWD 30-60 cm diameter, 16 pieces of LWD 60-90 cm diameter, and 5 pieces of LWD >90 cm diameter) (table 3-2 in R2 2003).

Future LWD availability will be evaluated by tallying the number and size of LWD pieces removed and stockpiled or intentionally left in place, and quantifying the change in LWD reservoir accumulations. Digital orthophotos of Baker Lake and Lake Shannon will be taken during early June full pool conditions within 1 year of FERC approval of the LWDMP. LWD accumulations larger than 0.25 acre will be delineated using geographical information system (GIS) software (or its equivalent). The area of the LWD accumulations will be determined by outlining the LWD accumulation while closely adhering to the irregularities of LWD pieces on the outside margins of the accumulation. Once a closed polygon of the accumulation is complete, the area within the polygon will be calculated using the GIS or equivalent area determination macro. The total area of all closed polygons larger than 0.25 acre will represent the amount of LWD accumulation at the time of the aerial imagery. Digital orthophotos of Baker Lake and Lake Shannon taken within 1 year of FERC plan approval will be used to establish a post-licensing baseline condition of LWD availability. Digital orthophotos of the reservoirs or equivalent imagery will be taken at license year 20; a comparison of LWD observed in the two sets of aerial imagery will be used to identify net changes in LWD accumulations.

An annual average input of 773 pieces of LWD is expected under with project conditions. If an average of 183 pieces of LWD are removed or intentionally left in place by ARG or TRIG direction, an average of 590 pieces of LWD would accumulate in the project reservoirs. The average annual input of 590 pieces of LWD over 20 years would be equivalent to 27.6 acres of LWD, assuming 107 pieces of LWD per 0.25 acre plot¹. If the expected input of LWD is observed, and the 20-year transport target is achieved, then the LWD accumulation in Baker Lake and Lake Shannon should increase by 27.6 acres. If the LWD accumulations in Baker Lake and Lake Shannon increase as expected, then the Year 1-20 annual target of 183 pieces of stockpiled LWD will be adopted as an annual target for the Year 21-50 period. If LWD accumulations in the reservoirs increase more than expected, then the LWD target for Years 21-50 will increase. If the LWD accumulations decrease compared to expectations, then the Year 21-50 target will be reduced (see figure 2). The target proportion of various sizes of transported WD will be confirmed by surveying three randomly selected 0.25 acre sample plots of accumulated LWD in Year 20.

¹ This assumes that 0.25 acres of accumulated LWD contains 107 pieces of LWD (86 pieces 30-60 cm diameter, 16 pieces 60-90 cm in diameter, and 5 pieces greater than 90 cm diameter).

LWD that accumulates in rafts can be quantified using aerial imagery; however, tracking the area of wood accumulations over time will not account for the entire volume of LWD that enters the reservoirs. Individual pieces of LWD, LWD removed by recreationalists for firewood, or is buried in sediment, decays, or is flushed downstream during major flood events will not be identified through aerial imagery.

The majority of wood removed by people foraging for firewood is smaller than the size of LWD to be removed and stockpiled under SA 109. Only a small amount of wood sinks or is buried and wood decay over a period of 20 years reduces wood density but does not significantly reduce LWD volume (Martin and Benda 2001). Wood that is flushed over Lower Baker Dam during flood events is not tracked but provides environmental benefit consistent with the objective of SA 109. Since tracking LWD accumulations through aerial imagery does not account for the disposition of all LWD that enters the reservoirs, the area of LWD accumulations must change more than 50 percent of expected in order to modify the LWD transport target. Adjustments to the target proportion of various sizes of transported LWD will follow the size distribution of LWD pieces accumulations surveyed in Year 20. The following formulae will be used to reconfigure the target piece number allocation within license period Year 21-50:

- If $[\Sigma_{2028}LWD\ aerial\ count - \Sigma_{2011}LWD\ aerial\ count] \geq 13.8$ acres but ≤ 41.4 acres, then the annual target of 183 pieces of stockpiled LWD will be adopted as an annual target for the Year 21-50 period.
- If $[\Sigma_{2028}LWD\ aerial\ count - \Sigma_{2011}LWD\ aerial\ count] < 13.8$ acres, then Year 21-50 target LWD count will be reduced by 25 percent.
- If $[\Sigma_{2028}LWD\ aerial\ count - \Sigma_{2011}LWD\ aerial\ count] > 41.4$ acres, then Year 21-50 target LWD count will be increased by 25 percent.

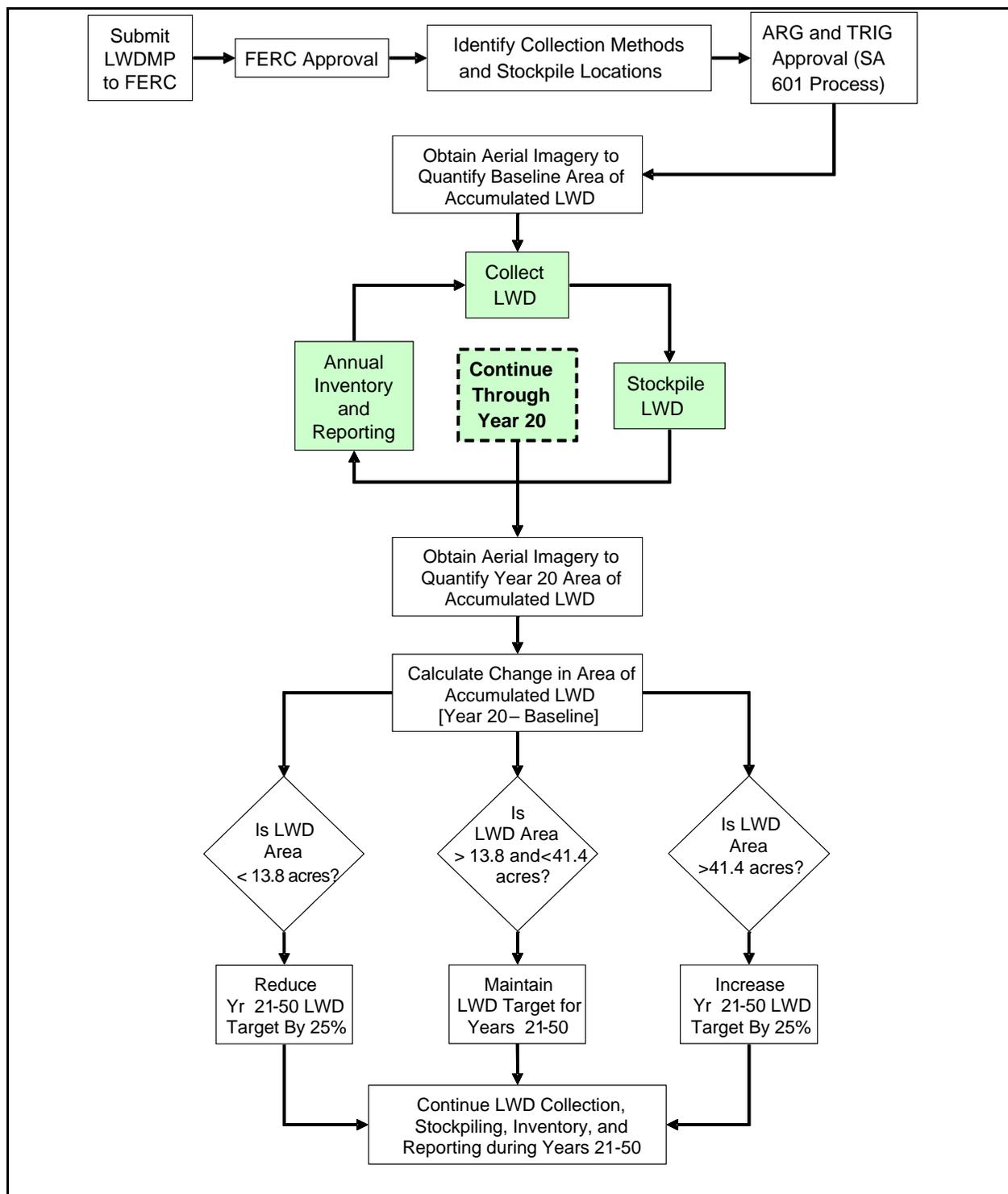


Figure 2. Process flow chart for the Large Woody Debris Management Plan, SA 109.

In addition to LWD removed from the reservoirs and stockpiles, LWD that is intentionally left in the reservoirs to provide in-place environmental benefits will be included in the calculation of LWD stockpiled to meet the year 20 target. The location

of LWD intentionally left in the reservoirs will be documented and not counted as part of the Year 20 LWD accumulation.

6.6 Schedule

Collection and transport of LWD to stockpile areas will be implemented following FERC approval of the LWDMP according to the timing, frequency, and schedule of LWD collection developed in consultation with the ARG.

Table 1. Implementation schedule for the Large Woody Debris Management Plan.

Implementation Activity	Schedule
Prepare stockpile area and obtain any required permits	Within 1 year of FERC plan approval
Obtain aerial imagery of the Baker Lake and Lake Shannon to establish baseline LWD accumulation	Within 1 year of FERC plan approval
Begin LWD collection and transport	Within 1 year of FERC plan approval
Frequency of LWD collection	At least every 3 years
Quantify and describe LWD transported to stockpile areas	Annually, consistent with SA 102
Distribute LWD stockpile inventory	Annually, consistent with SA 102
Obtain aerial imagery of the Baker Lake and Lake Washington to quantify change in the area of LWD accumulation	2028
Reconfigure target LWD size and piece number target using formula based on actual LWD accumulation	2028

6.7 Monitoring, Maintenance, and Management

PSE will be responsible for initial positioning of LWD at stockpile sites. Removal of the LWD from the stockpile sites is beyond the requirements of the LWDMP. Stockpiled wood will be made available for use as directed by the ARG and TRIG.

PSE will secure stockpile areas using means such as locked gates and/or fencing as appropriate if the stockpile areas are located on PSE property. PSE staff will provide access through locked gates or other restrictions as necessary, but will not assist in loading LWD onto transport vehicles or provide heavy equipment for LWD movement. PSE will maintain the stockpile areas by restacking LWD prior to restocking as necessary for safety and project efficiency. PSE staff will visually inspect the stockpile areas at least monthly unless weather conditions prevent road access.

The LWD stockpile areas will be inventoried each year to record the number, size, species, and condition of LWD available for use. The stockpile inventory will be provided to the ARG, TRIG, and FERC as part of annual reporting requirements described in SA 102 Aquatics Reporting. Management activities that are required in support of the LWDMP will be funded by PSE.

7.0 Reporting

PSE will submit an annual report that documents plan implementation during the prior 12-month period consistent with SA 102. The annual report will include:

- Summary description of the existing LWDMP, and proposed plan modifications (if any);
- Summary of efforts completed in the previous year relating to the plan requirements, including a tally of the LWD collected and stockpiled, and the size, number and location of any LWD intentionally left in the reservoirs to provide in-place environmental benefits;
- An accounting of the total number and size of LWD pieces used to meet the Year 20 target;
- Inventory of the number and size of LWD in the stockpile areas;
- Description of any problems encountered and associated remedies;
- Documentation of ARG and TRIG comments relating to license article implementation; and
- Description of how comments are accommodated; if recommendations are not adopted, the filing will include PSE's explanations based on project-specific information.

8.0 References and Literature Cited

- Martin, D. J. and L. E. Benda. 2001. Patterns of instream wood recruitment and transport at the watershed scale. *Trans. Amer. Fish. Society* 130:940–958.
- PSE (Puget Sound Energy). 2010. Final notes of the September 14, 2010 meeting of the Aquatic Resource Group, Baker River Project License Implementation, Puget Sound Energy, Inc. Bellevue, Washington.
- R2 (R2 Resource Consultants, Inc.). 2003. A-20, Large Woody Debris Budget. Aquatic Resources Working Group Study A-20, Baker River Hydroelectric Project, FERC No. 2150, Final Draft report dated July 2003 prepared by R2 Resource Consultants, Redmond, Washington for Puget Sound Energy, Inc., Bellevue, Washington. 125 p.
- Robison, E. G. and R. L. Beschta. 1990. Characteristics of Coarse Woody Debris for Several Coastal Streams of Southeast Alaska, USA. *Canadian Journal of Fisheries and Aquatic Sciences* 47: 1684-1693.

9.0 Review Comments and Responses

Under terms of the settlement agreement and 2008 FERC order issuing new license, the LWDMP was to be filed with the Commission within two years of license issuance. At the September 14, 2010 meeting of the ARG, a quorum was available and by consensus the ARG agreed to extend the deadline to January 31, 2011 (PSE 2010). On September 24, PSE sent, by certified mail, the Document Review Transmittal Letter and draft

LWDMP to the ARG and TRIG for 60-day review and comment (table 2). For reference purposes, the Document Review Transmittal Letter (figure 3) is provided in section 9.2.

9.1 Distribution List

Table 2. Parties that were mailed the draft Large Woody Debris Management Plan as part of the formal review process.

Name	Organization	Address
Aquatic Resource Group		
Ric Abbett	The WA Council of Trout	3025 Angus Drive S.E. Tenino, WA 98589
Len Barson	The Nature Conservancy	1917 First Avenue Seattle, WA 98101
Chuck Ebel	US Army Corps of Engineers	4735 E. Marginal Way S. Seattle, WA 98124
Alison Evans	WA Department of Ecology	3190 160th Ave. S.E. Bellevue, WA 98008-5452
Steve Fransen	NOAA Fisheries	510 Desmond S.E., Ste. 103 Lacey, WA 98503
JoAnn Gustafson	WA Dept. Natural Resources	919 N. Township Sedro-Woolley, WA 98284
Bob Helton	Skagit County Resident	21032 Little Mountain Rd. Mount Vernon, WA 98274
Brock Applegate	WA Dept. of Fish and Wildlife	PO Box 1100 La Conner, WA 98257
Lou Ellyn Jones	US Fish and Wildlife Service	510 Desmond S.E., Ste. 102 Lacey, WA 98503-1273
Scott Lentz	USDA Forest Service	810 State Route 20 Sedro-Woolley, WA 98284
Lorna Ellestad	Skagit County	1800 Continental Place Mount Vernon, WA 98273-5625
Scott Schuyler	Upper Skagit Indian Tribe	25944 Community Plaza Sedro-Woolley, WA 98284
Sue Madsen	Skagit Fisheries Enhancement Group	PO Box 2497 Mount Vernon, WA 98273
Stan Walsh	Sauk-Suiattle Indian Tribe	PO Box 368 La Conner, WA 98257
Stan Walsh	Swinomish Indian Tribal Community	PO Box 368 La Conner, WA 98257
Ashley Rawhouser	North Cascades National Park	810 SR 20 Sedro-Woolley, WA 98284
	Town of Concrete	45909 Division Street Concrete, WA 98237

Name	Organization	Address
Cary Feldmann	Puget Sound Energy	10885 NE 4th St PSE-09S Bellevue, WA 98004-5591
Informal Courtesy Copy		
Greta Movassaghi	USDA Forest Service	810 State Route 20 Sedro-Woolley, WA 98284
Jon-Paul Shannahan	Upper Skagit Indian Tribe	25944 Community Plaza Sedro-Woolley, WA 98284
Terrestrial Resources Implementation Group		
Len Barson	The Nature Conservancy	1917 First Avenue Seattle, WA 98101
JoAnn Gustafson	WA Dept. Natural Resources	919 N. Township Sedro-Woolley, WA 98284
Brock Applegate	WA Dept. of Fish and Wildlife	PO Box 1100 La Conner, WA 98257
Lou Ellyn Jones	US Fish and Wildlife Service	510 Desmond S.E., Ste. 102 Lacey, WA 98503-1273
Greta Movassaghi	USDA Forest Service	810 State Route 20 Sedro-Woolley, WA 98284
Lorna Ellestad	Skagit County	1800 Continental Place Mount Vernon, WA 98273-5625
Scott Schuyler	Upper Skagit Indian Tribe	25944 Community Plaza Sedro-Woolley, WA 98284
Stan Walsh	Sauk-Suiattle Indian Tribe	PO Box 368 La Conner, WA 98257
Stan Walsh	Swinomish Indian Tribal Community	PO Box 368 La Conner, WA 98257
Todd Wilbur	Swinomish Indian Tribal Community	PO Box 368 La Conner, WA 98257
Robert Kuntz	North Cascades National Park	810 SR 20 Sedro-Woolley, WA 98284
Bob Nelson	Rocky Mountain Elk Foundation	45 Overmeyer Road Raymond, WA 98577
Patrick Goldsworthy	North Cascades Conservation Council	P.O. Box 95980 Seattle, WA 98145-2980
Chris Madsen	Northwest Indian Fish Commission	6730 Martin Way E. Olympia, WA 98512
Cary Feldmann	Puget Sound Energy	10885 NE 4th St PSE-09S Bellevue, WA 98004-5591
Informal Courtesy Copy		
Jon-Paul Shannahan	Upper Skagit Indian Tribe	25944 Community Plaza Sedro-Woolley, WA 98284

9.2 Cover Letter

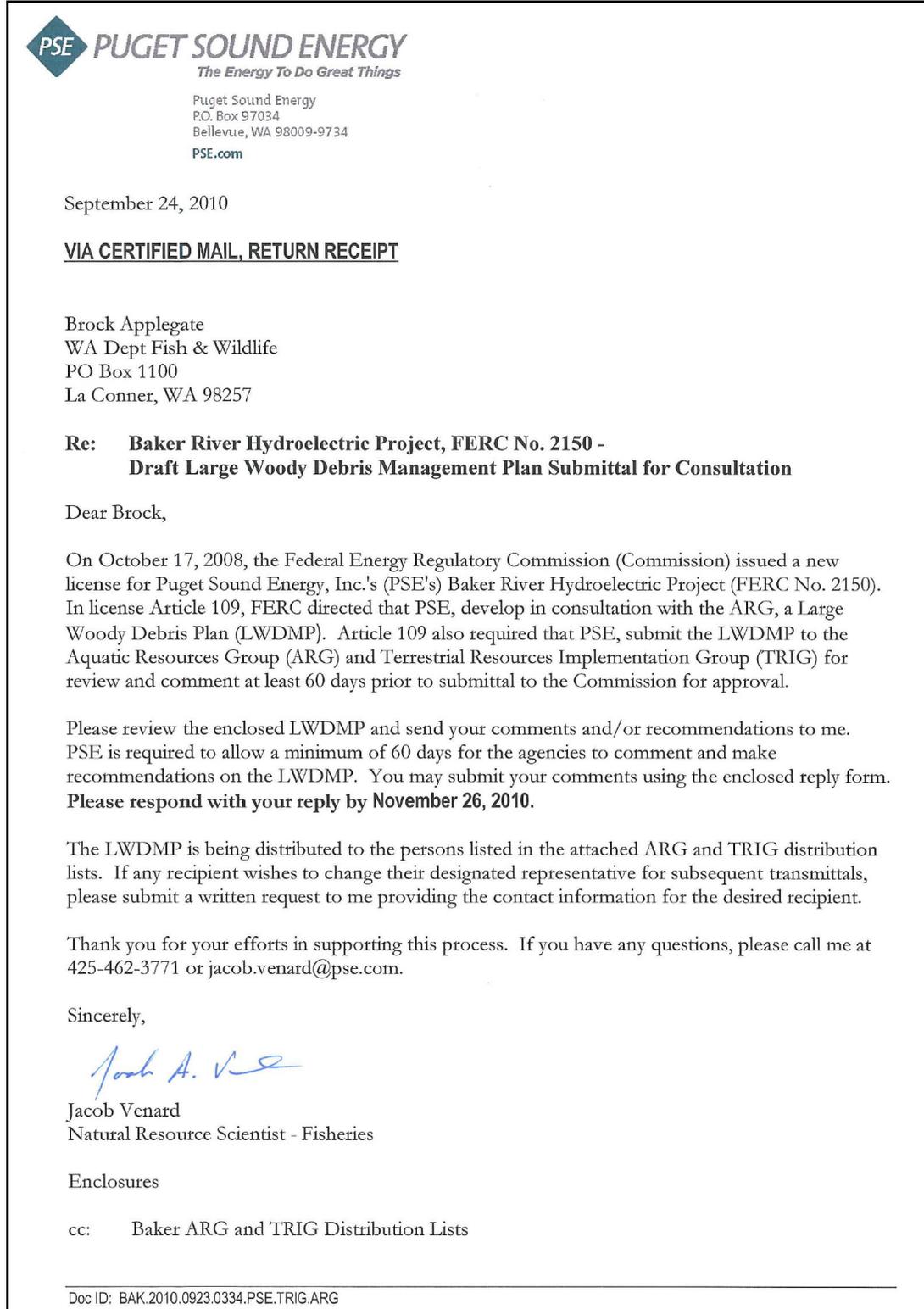


Figure 3. Example transmittal letter from Jacob Venard, PSE, September 24, 2010, distributing the draft Large Woody Debris Management Plan for 60-day review.

9.3 Summary of Reviewer Replies

The following reviewers sent comments to PSE (see section 9.4 for details).

- Jon-Paul Shannahan, Upper Skagit Indian Tribe
- Greta Movassaghi, USDA Forest Service (comments provided on 11/30 and 12/09)

The following reviewers replied but had no comments.

- Patrick Goldsworthy, North Cascades Conservation Council
- LouEllyn Jones, U.S. Fish and Wildlife Service
- JoAnn Gustafson, Washington Department of Natural Resources

9.4 Reviewer Comments and PSE Responses

Comments received from reviewers and PSE responses to those comments are provided in table 3. Copies of the original comment letters are provided in section 9.5.

Table 3. Comments following formal review of the Large Woody Debris Management Plan, September 24 - November 26, 2010, and PSE response to those comments.

Comment	Puget Sound Energy Response
NCCC - Patrick Goldsworthy, received October 7, 2010	
I have no comments.	Comment noted. No revisions to plan.
USFWS - LouEllyn Jones, received October 7, 2010	
I have no comments.	Comment noted. No revisions to plan.
WA DNR - JoAnn Gustafson, received November 17, 2010	
I have no comments.	Comment noted. No revisions to plan.
USIT - Jon-Paul Shannahan, received November 24, 2010	
One concern over the draft document that should be addressed somewhere is the SA needs a detailed implementation plan to provide guidance on prioritizing or making decisions about use of wood.	SA 109 provides for the reasonable transport of large woody debris from project reservoirs to mutually agreeable stockpile areas in the Baker River basin. The scope of the article does not extend to use of the wood. Use of the stockpiled wood is under the direction and responsibility of the ARG and TRIG. No revisions to the plan.

Comment	Puget Sound Energy Response
<p>4.0 Goals Page 7: "Stockpiled wood will be made available for use in habitat restoration or protection projects..."</p> <p>The text on page 15 under 6.7 Monitoring, Maintenance, and Management is another description of how wood could be used. I think it is important to use the same text for framing how this wood could be used. Please consider using that the text from page 15; "Wood may be used as part of restoration or protection efforts in the Baker River basin performed as part of the restoration or protection...or stream restoration activities".</p>	<p>Referenced text on pages 7 and 15 have been replaced with the following sentence: "Stockpiled wood will be made available for use as directed by the ARG and TRIG."</p>
<p>6.1 Plan Area Page 9: "This plan applies to LWD deposited below the full pool level within Baker Lake and Lake Shannon" Please review first two bullets on page 2, in summary they state that wood gets stuck above full pool because of large fetch and prevailing southerly winds (surface seiches). Is the pool elevation the definitive measurement or can some flexibility be built into what wood is covered and what wood is not; say pool elevation +/- couple of feet?</p>	<p>The full pool elevation was considered a guideline to minimize the shoreline disturbance caused by wood removal and to preserve the environmental benefits of retaining wood within reservoir shoreline riparian areas. Some flexibility is desirable in areas where large rafts of LWD may extend above the full pool elevation. The referenced sentence has been revised as follows: "This plan applies to LWD deposited within two feet of the full pool level of Baker Lake and Lake Shannon". Wood will not be removed if the procedure would cause undue shoreline disturbance.</p>

Comment	Puget Sound Energy Response
<p>6.5.1 Identify LWD available for Removal Page 10: "LWD that is identified by ARG or the Trig as providing inplace environmental benefits will marked for identification and included in the count of stockpiled LWD" This statement is in conflict with statement made under 6.5.4 page 15 and A-20 modeling "channel or lake storage". Wood left for ecosystem function should not be counted as stockpiled wood, assumptions under the modeling effort to determine downstream transport accounted for this. An accounting system for this should be developed that is different than stockpile inventory. Additionally this wood should be mapped with GPS technology so that movement within reservoir would be captured with continued monitoring, and document if function is lost due to recreational harvest of fire wood.</p>	<p>The 20-year transport target identified in SA 109 is equivalent to an average annual target of 183 pieces of LWD. This average annual target was derived from modeling results that estimated annual LWD recruitment to the mainstem Skagit River after 40 years of without project conditions. Without project conditions included allowances for channel storage and storage within historic Baker Lake (R2, 2003). The expected annual input of 773 pieces of LWD to Baker Lake and Lake Shannon under existing conditions does not reflect lake storage or downstream transport of wood through the reservoirs.</p> <p>The scope of SA109 provides for the reasonable transport of LWD to stockpile areas. PSE is not responsible for the fate of wood removed from the stockpile area by direction of the ARG and TRIG. If the ARG and TRIG request that PSE not collect specific pieces of LWD from the reservoirs, and the LWD would otherwise be available for transport and stockpiling, those pieces should not be considered accumulated wood under the formula for reconfiguring target quantities at Year 20. No revision to plan.</p>
<p>6.5.2 Collect and Transport LWD Page 11: "PSE has identified the sea plane launch area within Baker Lake and a cover near Lake Shannon boat launch." Please label figure one with Lake Shannon location, near boat launch is ambiguous.</p>	<p>The exact location and perimeter of the Lake Shannon LWD stockpile site has not yet been identified. As stated in section 6.5.3, the location of proposed stockpile areas will be provided to the ARG and TRIG for review and comment within one year of FERC approval of the LWDMP. The construction staging area for the Lake Shannon downstream fish passage facility will be located near the boat launch and is a possible location for the long-term LWD stockpile site. Given the scale of figure 1, the arrow and label for the boat launch specifies the general location of the LWD stockpile site. No revisions to plan.</p>
<p>6.5.3 Stockpile and Inventory LWD Page 11: "The LWD stockpile areas will be inventoried each year to record number, size, species and condition of available for use by other parties." Please consider removing all use of "other parties" to settlement signatories' or something similar to reflect only agencies that have signed the Settlement Agreement can access this resource.</p> <p>"PSE will maintain a separate tally of the number and size..." Please consider recording and accounting of LWD removed from stockpile by agency, project type, and location of project.</p> <p>"LWD pieces intentionally allowed to remain in place..." see comment on 6.5.1 page 10 above.</p>	<p>The phrase "by other parties" has been deleted without replacement in all sections of the plan.</p> <p>PSE will inventory wood within the stockpile site, implement measures to prevent theft, and allow the loading and removal of wood. Use of the stockpiled wood is under the direction and responsibility of the ARG and TRIG and is beyond the scope of SA 109.</p> <p>See previous response to comment 6.5.1.</p>

Comment	Puget Sound Energy Response
Figure 2 Page 14: Please incorporate changes described at Nov. 9, 2010 ARG meeting.	As discussed at the ARG meeting, target acreage values for Year 20 LWD accumulations were revised, and references to LWD size classifications will use 30-60 cm, 60-90 cm and > 90 cm and avoid "small," "medium," and "large" terminology.
6.6 Schedule Page 15: In Table 1 please remove references to Lake Washington and replace with Lake Shannon.	The schedule in table 1 has been revised.
6.7 Monitoring, Maintenance, and Management Page 16: Please replace "other parties" based on comment above.	The phrase "by other parties" has been deleted without replacement in all sections of the plan.
USDA-FS – Greta Movassaghi, received November 30, 2010 after the formal review period ended on November 26, 2010	
As I said at the ARG meeting, we would like to see some sort of implementation plan for how the stockpiled wood is apportioned relative to; priorities for access to the wood, process for dispersing and management of the stockpile.	PSE will inventory wood within the stockpile site, implement measures to prevent theft, and allow the loading and removal of wood. Use of the stockpiled wood is under the direction and responsibility of the ARG and TRIG. No revision to plan.
We also have a concern about where and how the reservoir clearing operations will be conducted as they relate to our recreation sites.	The following sentence has been added to the end of section 6.5.1, paragraph 1: "PSE will consult with the USDA-FS prior to LWD collection activities at USDA-FS shoreline recreation sites and include the results of such consultation in the annual report."
USDA-FS – Greta Movassaghi, received December 09, 2010 after the formal review period ended on November 26, 2010	
We want to have the plan address how the decision is made about where wood is left to accumulate in the reservoir. Safety and recreation facilities need to be taken into account. Wood for habitat, should be left where is provides the most benefit, not just assume that wood can be left anywhere.	PSE will remove LWD in the reservoirs in order to meet the target quantities of stockpiled wood identified in SA 109. LWD will not be removed if the procedure would cause undue shoreline disturbance or if the ARG or TRIG request that PSE not collect specific pieces of LWD. The following sentence has been added to the end of section 6.5.1, paragraph 1: "PSE will consult with the USDA-FS prior to LWD collection activities at USDA-FS shoreline recreation sites and include the results of such consultation in the annual report."

9.5 Comment Correspondence

Baker Consultation Reply Form



REPLY FORM to Baker River Hydroelectric Project
Large Woody Debris Management Plan
Submittal for Consultation

Name: Patrick D. Goldsworthy
Job Title: Chairman
Representing: North Cascades Conservation Council
Address: Postoffice Box 95980 - University Station
City, State, Zip: Seattle, WA 98145-2960

Instructions: Please select from the following options:

- I have read the draft Large Woody Debris Management Plan and I have no comments.
- I have read the draft Large Woody Debris Management Plan and I have comments, listed below.
(Please use additional paper, if needed).

I have read the draft Large Woody Debris Management Plan and I will email my comments to *jacob.venard@pse.com*.

I do not wish to be involved in the consultation process.

Important:

Please send this reply via the self-addressed envelope and mail no later than **November 26, 2010**.

Date Reply Form Received by PSE: October 7, 2010

DOC ID#

SEP 29 2010

Baker Consultation Reply Form



REPLY FORM to Baker River Hydroelectric Project Large Woody Debris Management Plan Submittal for Consultation

Name: Lou Ellen Jones

Job Title: Fish + Wildlife Biologist

Representing: US Fish + Wildlife Service

Address: 510 Desmond Dr.

City, State, Zip: Lacey, WA 98503

Instructions: Please select from the following options:

- I have read the draft Large Woody Debris Management Plan and I have no comments.
- I have read the draft Large Woody Debris Management Plan and I have comments, listed below.
(Please use additional paper, if needed).

- I have read the draft Large Woody Debris Management Plan and I will email my comments to *jacob.venard@pse.com*.
- I do not wish to be involved in the consultation process.

Important:

Please send this reply via the self-addressed envelope and mail no later than **November 26, 2010**.
Date Reply Form Received by PSE: October 7, 2010

DOC ID#

Baker Consultation Reply Form



REPLY FORM to Baker River Hydroelectric Project Large Woody Debris Management Plan Submittal for Consultation

Name: Dept of Natural Resources
 Job Title: John Gustafson Orca District Manager
 Representing: DNR
 Address: 919 N Township
 City, State, Zip: Sedro Woolley WA 98284

Instructions: Please select from the following options:

- I have read the draft Large Woody Debris Management Plan and I have no comments.
- I have read the draft Large Woody Debris Management Plan and I have comments, listed below.
(Please use additional paper, if needed).

- I have read the draft Large Woody Debris Management Plan and I will email my comments to *jacob.venard@pse.com*.
- I do not wish to be involved in the consultation process.

Important:

Please send this reply via the self-addressed envelope and mail no later than **November 26, 2010**.
Date Reply Form Received by PSE: November 17, 2010

DOC ID#

Aspelund, Arnie

From: Jon-Paul Shannahan [jonpauls@UPPERSKAGIT.com]
Sent: Wednesday, November 24, 2010 2:40 PM
To: Aspelund, Arnie
Cc: Feldmann, Cary
Subject: USIT comments on SA 109

Arnie,

Please accept the USIT's comments for the draft LWD Management Plan or SA 109.

One concern over the draft document that should be addressed somewhere is the SA needs a detailed implementation plan to provide guidance on prioritizing or making decisions about use of wood.

4.0 Goals Page 7: "Stockpiled wood will be made available for use in habitat restoration or protection projects..." The text on page 15 under 6.7 Monitoring, Maintenance, and Management is another description of how wood could be used. I think it is important to use the same text for framing how this wood could be used. Please consider using that the text from page 15; "Wood may be used as part of restoration or protection efforts in the Baker River basin performed as part of the restoration or protection....or stream restoration activities".

6.1 Plan Area Page 9: "This plan applies to LWD deposited below the full pool level within Baker Lake and Lake Shannon" Please review first two bullets on page 2, in summary they state that wood gets stuck above full pool because of large fetch and prevailing southerly winds (surface seiches). Is the pool elevation the definitive measurement or can some flexibility be built into what wood is covered and what wood is not; say pool elevation +/- couple of feet?

6.5.1 Identify LWD available for Removal Page 10: "LWD that is identified by ARG or the Trig as providing in-place environmental benefits will be marked for identification and included in the count of stockpiled LWD" This statement is in conflict with statement made under 6.5.4 page 15 and A-20 modeling "channel or lake storage". Wood left for ecosystem function should not be counted as stockpiled wood, assumptions under the modeling effort to determine downstream transport accounted for this. An accounting system for this should be developed that is different than stockpile inventory. Additionally this wood should be mapped with GPS technology so that movement within reservoir would be captured with continued monitoring, and document if function is lost due to recreational harvest of fire wood.

6.5.2 Collect and Transport LWD Page 11: "PSE has identified the sea plane launch area within Baker Lake and a cover near Lake Shannon boat launch." Please label figure one with Lake Shannon location, near boat launch is ambiguous.

6.5.3 Stockpile and Inventory LWD Page 11: "The LWD stockpile areas will be inventoried each year to record number, size, species and condition of available for use by other parties." Please consider removing all use of "other parties" to settlement signatories' or something similar to reflect only agencies that have signed the Settlement Agreement can access this resource.
"PSE will maintain a separate tally of the number and size..." Please consider recording and accounting of LWD removed from stockpile by agency, project type, and location of project.
"LWD pieces intentionally allowed to remain in place..." see comment on 6.5.1 page 10 above.

Figure 2 Page 14: Please incorporate changes described at Nov. 9, 2010 ARG meeting.

6.6 Schedule Page 15: In Table 1 please remove references to Lake Washington and replace with Lake Shannon.

11/29/2010

6.7 Monitoring, Maintenance, and Management Page 16: Please replace "other parties" based on comment above.

Thanks for considering these comments.
Jon-Paul

Jon-Paul Shannahan
Biologist Upper Skagit Indian Tribe
25944 Community Plaza Way
Sedro-Woolley, WA 98284
(360) 854-7089
Fax (360) 854-7042

11/29/2010

Aspelund, Arnie

From: Greta Movassaghi [gmovassaghi@fs.fed.us]
Sent: Tuesday, November 30, 2010 7:34 AM
To: Aspelund, Arnie
Subject: comments on SA 108 and 109 plans

Arnie

We have no comments on SA 108

SA 109:

As I said at the ARG meeting, we would like to see some sort of implementation plan for how the stockpiled wood is apportioned relative to; priorities for access to the wood, process for dispersing and management of the stockpile. We also have a concern about where and how the reservoir clearing operations will be conducted as they relate to our recreation sites.

Thanks

~~~~~  
Greta Movassaghi  
Natural Resource Specialist --  
Skagit Wild & Scenic River / Hydro  
Mt. Baker-Snoqualmie National Forest  
810 SR 20  
Sedro-Woolley, WA 98284

Sedro Woolley: 360-854-2630  
Darrington: 360-436-2325  
Cell: 360-631-4499  
email: gmovassaghi@fs.fed.us  
<http://www.fs.fed.us/r6/mbs/skagit-wsr/>  
~~~~~

11/30/2010

From: Greta Movassaghi [mailto:gmovassaghi@fs.fed.us]
Sent: Thursday, December 09, 2010 8:11 AM
To: Aspelund, Arnie
Cc: Jon Vanderheyden
Subject: Fw: comments on SA 108 and 109 plans

Arnie

A few more comments on SA 108 and 109, sorry for the lateness

ON 108

We don't agree that the area to be monitored should only start at the Baker confluence with the Skagit. There could be some upstream effects as a result of the change in Baker sediment regime. Monitoring should extend upriver on the mainstem to account for these effects.

On 109

We want to have the plan address how the decision is made about **where** wood is left to accumulate in the reservoir. Safety and recreation facilities need to be taken into account. Wood for habitat, should be left where it provides the most benefit, not just assume that wood can be left anywhere.

Thanks

~~~~~  
Greta Movassaghi  
Natural Resource Specialist --  
Skagit Wild & Scenic River / Hydro  
Mt. Baker-Snoqualmie National Forest  
810 SR 20  
Sedro-Woolley, WA 98284

Sedro Woolley: 360-854-2630  
Darrington: 360-436-2325  
Cell: 360-631-4499  
email: gmovassaghi@fs.fed.us  
<http://www.fs.fed.us/r6/mbs/skagit-wsr/>  
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