City of Tacoma,
Department of Public Utilities, Light Division
Cowlitz Hydroelectric Project
FERC No. 2016

Settlement Agreement License Article 9

Large Woody Debris Plan

1. INTRODUCTION

This plan is prepared in compliance with the requirements of Settlement Agreement License Article 9, contained in Appendix A of the Federal Energy Regulatory Commission's (the Commission) Order Approving Settlement and Issuing New License for FERC Project No. 2016, issued and effective July 18, 2003. The license article requires the City of Tacoma, Department of Public Utilities, Light Division (Tacoma Power) to develop and file a plan for making large woody debris (LWD) available for fish habitat restoration projects in the Cowlitz River basin within one (1) year of license issuance.

PROJECT DESCRIPTION

The Cowlitz Project (FERC No. 2016) is Tacoma Power's largest electricity generating facility and is located on the Cowlitz River, Lewis County, Washington. The Project consists of two dams, the Mayfield Dam at river mile (RM) 52 and Mossyrock Dam, upstream at RM 65. In addition to the project generating electricity and providing flood control, Tacoma operates 3 major parks, manages approximately 14,000 acres of wildlife lands, and owns and funds operation of the Cowlitz Salmon Hatchery (RM 50) and the Cowlitz Trout Hatchery (RM 42). The Barrier Dam, associated with the Cowlitz Salmon Hatchery is located at RM 49.5. The original 50-year license for the Cowlitz Project was issued on December 28, 1951. A new thirty-five year license was issued and became effective on July 18, 2003.

The Mayfield development completed in 1963 includes a 250-foot-high, 850-foot-long, concrete arch and gravity dam that impounds Mayfield Lake, which has a maximum surface area of 2, 250 acres. In addition to the Cowlitz River, inflows from the Tilton River also contribute to Mayfield Lake, which supports public and private recreational facilities. An 854-foot-long power tunnel passes through the right abutment of the dam and terminates at a concrete forebay structure. Four penstocks continue from the forebay structure to the four generating units, which have an installed capacity of 162-megawatts (MW).

The Mossyrock development completed in 1968 includes a 606-foot-high double curvature concrete arch dam that creates Riffe Lake, a 23-mile long, 11,830-acre reservoir with 52 miles of shoreline. Riffe Lake supports several parks and other recreational facilities. Three penstocks, varying in length from 248 to 285 feet, extend down to the powerhouse, which is adjacent to the base of the dam. The powerhouse contains two generating units with room for a third, and has a total installed capacity of 300 MW. Transmission lines link the Mossyrock and Mayfield developments.

2. FERC License Article

Settlement Agreement and License Article 9. Large Woody Debris

Within 1 year of license issuance, the Licensee shall submit a plan to continue to make large woody debris available for fish habitat restoration projects in the Cowlitz River basin. The large woody debris plan shall include: a) a description of the source/s of large woody debris to be made available; b) measures for transporting and delivering large woody debris within the Cowlitz River basin; c) guidelines for the use and disbursement of large woody debris for restoration projects, giving first priority to projects within the lower basin, second priority to upper basin projects, and third priority to projects outside the basin; and d) provisions for storage of large woody debris and for disposal of unused debris. The Licensee shall prepare the plan in collaboration with the Fisheries Technical Committee provided for in the August 2000 Settlement Agreement, or if the Settlement Agreement has become void, with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife, U.S. Forest Service and Washington Department of Ecology (referred to as "the FTC or agencies"). When a draft plan has been prepared, it shall be provided to all affected agencies and Tribes for 30-day review and comment. The Licensee shall include with the final plan documentation of consultation and copies of comments and recommendations, and specific descriptions of how the final plan accommodates all comments and recommendations. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. The Commission reserves the right to require changes to the plan. Upon Commission approval, the Licensee shall implement the plan, including any changes required by the Commission. Following Commission approval, the plan becomes a requirement of the license, enforceable by the Commission.

3. Background

Prior to the construction of Tacoma Power's hydroelectric and operational dams on the Cowlitz River, woody debris was supplied to the river from the watershed upstream of the dams. The construction of the dams modified the natural downstream migration of the woody debris in the Cowlitz River by changing the flood flow frequency and reducing the input of wood into the lower river. LWD suitable for habitat forming processes and fish habitat continues to migrate down the Cowlitz River. This material is trapped and additive to the woody debris load already present in the reservoir from shoreline stumps, snags, beached trees and other wood left from historic activities. For purposes of this plan, the minimum size of wood that will be classified as LWD is 20 feet in length and 10 inches in diameter at the bole.

Wood enters both Riffe and Mayfield reservoirs at highly variable rates depending on weather, flows, and upstream activities. Very large quantities occur in flood years and very small quatities occur in drought years. The quality of the wood is also highly variable. The most common type is small floating debris. Large diameter trees occur less frequently and usually are associated with flood events. Approximately two acres of wood are collected on Lake Mayfield annually. Of this, amount it is estimated that about 600 lineal feet of trees with root wad suitable for placement are recovered each year. In some years less than this amount occurs and in other years more may occur. Tacoma Power believes that stockpiling LWD in years when there is an excess will make LWD available in years when very little is collected. Wood also enters Riffe Lake by being passed through Cowlitz Falls Dam. Most of this wood is distributed by the wind to the flats on the east end of the lake, leaving little wood available for collection. Wood is collected in Riffe Lake intermittently. In high rainfall years, when excessive

amounts of woody debris accumulate on the reservoir surface, or is floated off of the shallow flats the wood suitable for habitat is decked. Historically, this wood has been taken by the United States Forest Service for habitat projects primarily in the upper basin. The amount of LWD taken by the USFS in the past year is approximately 1500 lineal feet with about 60 percent of that coming from Riffe Lake. This has been decked by the USFS and will be placed in Yellowjacket Creek for habitat enhancement in the summer of 2004. This is being funded by a grant from the National Fish and Wildlife Foundation.

Studies during Project relicensing (Harza 1999b) demonstrated that the quantity and distribution of LWD in the Cowlitz River between the Barrier Dam and the Toutle River has not significantly changed from the pre-Project time period (1939), however, there was heavy harvesting of timber in the upper Cowlitz River basin during the pre-Project study period and that may have influenced the amount of LWD available for the lower river.

4. Objectives

1. Provide a plan to continue to make LWD available for fish habitat restoration projects in the Cowlitz River basin.
2. Resume LWD migration and re-distribution in the Cowlitz River by transporting biologically significant LWD below the Barrier Dam and introducing it into the river in a manner consitant with public safety.
3. Evaluate and monitor the placement and residence of biologically significant LWD in the Cowlitz River from the Barrier Dam to the Toutle River mouth.
4. Monitor public safety issues connected with placement of LWD below the Barrier Dam
5. Provide a record of consultation with the Fisheries Technical Committee (FTC) and the Habitat Advisory Group (HAG) for making LWD available for fish habitat restoration projects in the Cowlitz River basin.

5. PLAN

LWD Sources

Mayfield and Riffe Lakes:
Wood is encountered in Mayfield and Riffe Lakes during routine reservoir clearing operations. Typically Mayfield reservoir is swept of floating wood prior to the summer recreation season, and both Riffe and Mayfield may be cleared following flood events that input large amounts of wood. Sweeping is an operational requirement done to reduce threats to the dams, spillways, powerhouses and the boating public. Due to the variable nature of LWD recruitment and flood flow frequencies, sweeping is done on an as-needed basis, not necessarily every year.

Guidelines For Use and Disbursement

The priority objective of the Cowlitz Settlement Agreement (SA) is to recover wild, indigenous salmonid stocks in the Cowlitz River basin. The emphasis of actions under the SA and required by the FERC license is upon ecosystem integrity and recovery of these stocks to harvestable levels. As a result of this concern the SA emphasized a program that made wood available for habitat projects in the basin. A significant focus of the SA was the restoration of anadromous salmonids to the upper watershed (above Cowlitz Falls). Because a large portion of stream length occurs in the upper watershed, habitat conditions in the upper watershed are key to

restoration of those anadromous salmonid runs. Upper watershed habitat enhancement with LWD is key to fish restoration, and this plan recognizes the importance of upper watershed habitat restoration and enhancement. The input of LWD to the lower river was discussed during relicensing and there was significant concern about public safety issues of releasing large logs into a river that is a very popular fishing site. In response to a strong interest from the WDFW Tacoma has conducted some experiments with releasing large wood into the lower river. The evaluation following high flows in winter 2003 demonstrated the material re-distributed in the lower Cowlitz River where only 21% of the pieces were accounted for in subsequent surveys. This is due to the shape of the river channel and the resulting flow patterns. During this same test, many fishermen in boats and in the river had to scramble for safety when the logs broke loose from the placement site. As a result of these concerns we have developed a plan that puts a sustainable average amount of LWD into the lower river with monitoring of travel and safety. If threats to public safety are apparent as a result of the implementation of this plan, Tacoma will notify and work with the HAG and FTC to resolve safety issues, and activities will be suspended until these safety issues are resolved. The FTC and the HAG will review any modifications to the plan. Tacoma Power is making any excesses available for basin habitat projects. The USFS has been using all extra wood that is available for upper basin projects. We believe this is very valuable for the basin as it restores the wood to the upper basin in monitored habitat projects.

To conform to the SA guidelines and be mindful of public safey we have developed the following plan. The prioritized objectives of LWD encountered in the reservoirs are:

Mayfield Lake:

1. A portion of the LWD encountered annually in Mayfield Lake that meets the criteria for biologically significant LWD suitable for placement in the Cowlitz River shall be placed below the ordinary high water (OHW) line downstream of Barrier Dam. This material will be placed until an annual goal of approximately 600 linear feet is reached. This is estimated to be the amount of suitable LWD available annually. Tacoma will document all LWD that is decked and include this information in the annual Hydropower Compliance Management Plan report to FERC. Copies of this report will be given to the FTC and HAG members. Ideal placement timing would be during low flow periods to allow subsequent higher flows to re-distribute the introduced LWD.
2. As LWD is available in Mayfield Lake, it will be decked up to the limit of available storage space by Tacoma Power for an annual placement of approximately 600 lineal feet downstream of Barrier Dam during years in which no suitable LWD is available.
3. LWD from Mayfield Lake in excess of the above amounts will be made available for Cowlitz River basin watershed enhancement projects and then for watershed enhancement projects out of the Cowlitz River basin.
4. Prior to reaching storage space limits for decking LWD, Tacoma Power will contact the WDFW and USFS to see if they can place the excess in other habitat projects. If WDFW or USFS cannot place the excess LWD, it will be properly disposed of.

Riffe Lake:

1. Wood encountered in Riffe Lake that meets the criteria for biologically significant LWD, and which have firm commitments for use in habitat enhancement projects, will be decked above the OHW line at Riffe Lake and made available for Cowlitz River basin watershed enhancement projects. Tacoma will document all LWD that is decked and include this information the annual Hydropower Compliance Management Plan report to FERC. Copies of this report will be given to the FTC and HAG members.

2. LWD will be decked by Tacoma Power at Riffe Lake for future habitat enhancement projects as LWD is available in Riffe Lake.
3. LWD from Riffe Lake in excess of the above amounts will be made available for watershed enhancement projects out of the Cowlitz River basin.
4. Prior to reaching storage space limits for decking LWD at Riffe Lake, Tacoma Power will contact the WDFW and USFS to see if they can place the excess in other habitat projects. If WDFW or USFS cannot place the excess LWD, it will be properly disposed of.

Transportation, Storage and Disposal

Mayfield Lake:
Tacoma Power will transport and place the introduced LWD below Mayfield Dam on an annual basis per the schedule and amounts proposed above. This may include LWD decked at Mayfield Lake for years in which no other LWD source is available.

Tacoma Power will make LWD available and load transport vehicles at Mayfield Lake (in excess of the annual placement and decked amounts) for Cowlitz River basin habitat enhancement projects. Wood not meeting the LWD criteria from Mayfield Lake will be properly disposed of.

Riffe Lake:
Tacoma Power will deck all biologically significant LWD cleared from Riffe Lake for use in habitat enhancement projects. This material will be made available for habitat enhancement programs per the priorities listed above. Tacoma Power will load the transport vehicles at Riffe Lake for all projects. Wood not meeting the LWD criteria will be properlyly disposed of.

Placement

Two possible lower Cowlitz River introduction sites have been identified. One is located at the north side of the Barrier Dam boat launch at the confluence of Mill Creek (River Mile 49.2). The other site is located approximately 400 yards upstream of the Blue Creek boat launch at RM 42.0. Previous successful introductions of LWD at the Blue Creek site resulted in minimal bank and boat angler conflicts, thus partiality is given to placing wood at the Blue Creek site.

In response to public comments, and in regard for public safety, Tacoma Power will make best efforts to prevent the introduced LWD from floating free of the shoreline all at once. The LWD introductions may be at varying shorelines elevations, mixed with downstream gravel placements or only a portion of the annual quantity placed at the re-introduction site at a time.

Monitoring, Evaluation and Reporting

Implementation of the LWD Plan will be monitored to identify any change in the overall volume of woody debris present in the Lower Cowlitz River. The evaluation reach will extend from the Barrier Dam boat launch to the Toutle River confluence. A total of 10 sample sites will be established in this reach by either ground transects or aerial photography. Baseline surveys of these sites will be performed in the fall of 2004 to describe existing conditions and volumes of LWD. Surveys will be repeated every five years to identify any change in volume of LWD.

Documentation of activities related to the LWD Plan will be included in the annual report submitted annually as required by Article 501, Hydropower Compliance Management Plan, to the affected agencies and FERC. This report will include; the volume of LWD transported

downstream to the introduction site, the volume and destination of LWD distributed for specific habitat enhancement projects, and the volume of LWD entering Riffe and Mayfield Lakes during the previous winter, and detailed documentation of any safety complaints. A report will also be prepared and distributed every five years following evaluation of the established sample sites. This report will present results of sample site observations and summarize activities related the LWD management in the Cowlitz River. This report will be made available to the affected agencies by March 1 for a 30-day comment period and submitted to FERC by May 1. The first 5-year report will be submitted to FERC by May 1, 2010. Procedures will be revised in consultation with the HAG and FTC within 90 days of distribution of the 5-year report.

Notification

Signage will be posted at the lower Cowlitz River LWD introduction sites. The signs will describe the purpose of the project and a brief description of the related activities. A letter will be sent to interested parties and agencies to notify them about this project.

6. SCHEDULE

This plan is similar to a 2002 Tacoma Power trial program on the Cowlitz River. The above-described techniques were instituted with LWD from Mayfield Lake and placed at the Blue Creek site in 2002. This proposal will continue that activity on an annual basis.

The first year of LWD re-introduction proposed under this plan will occur based on the availability of LWD meeting the proper criteria in Mayfield Lake. Typically this material is swept during spring and summer reservoir clearing operations.

The LWD re-introduction will commence upon FERC approval of the plan and the acquisition of all necessary permits. An interim report, prepared in consultation with the FTC and HAG, will be submitted to FERC by December 31 of year 2 of the program and a project report with findings will be submitted to FERC at the end of years 5 and 10. These will include an evaluation of the effectiveness of the annual program of placement of the approximately 600 lineal feet of biologically significant LWD Tacoma assumes that LWD introduction and LWD availability program will thereafter become a standard operating requirement of the license.

7. CONSULTATION

No comments were received during consulation with the Fisheries Technical Committee on the draft Large Woody Debris plan. The only comment during the 30-day review period was received from Hal Beecher of the Washington Department of Fish and Wildlife. As a result of that comment letter, Tacoma Power met with Hal Beecher on June 16, 2004 to discuss their issues. As a result of that meeting, it was agreed to work closely with WDFW to make changes to the plan. The attached letter from Hal Beecher confirms that this has been done and that the plan was modified to the satisfaction of WDFW.

Appendix A: Consultation

Record of Consultation

30 – Day Review Transmittal Letters

Communication/Consultation Settlement Agreement Article 9 Large Woody Debris Plan

Date	Agencies/ Committees	Participants	Type of Communication	Topics
March 4, 2003	FTC	Craig Burley- WDFW Steve Fransen- NOAA Brad Caldwell- WDOE Bill Robinson-CC George Lee- YN Gene Stagner- USFWS	Meeting	• Woody Debris Placement and other related activities
October 14, 2003	FTC	Chuck Johnson & Wolf Dammers - WDFW Jim Pacheco- WDOE Jim Tuggle—CC	Meeting	• Schedule for various plan submittals including Large Woody Debris Plan- Schedule distributed
February 23, 2004	FTC	Craig Burley- WDFW Steve Fransen- NOAA Brad Caldwell- WDOE Bill Robinson-CC George Lee- YN Gene Stagner- USFWS	Mail	• Draft of Large Woody Debris for FTC review and comment.
May 7, 2004	FTC	Craig Burley- WDFW Michelle Day- NOAA Brad Caldwell- WDOE Jim Tuggle-CC George Lee- YN Lou Ellyn Jones- USFWS	Mail	• Letter advising start of 30-agency and Tribe review period. Advised to refer to copy of plan sent on Feb 23, 2004 as there had been no changes.
May 7, 2004	CIT	John Barnett	Mail	• Cover letter and draft of Large Woody Debris Plan for review and comment
June 16, 2004	WDFW	Hal Beecher	Meeting	• Discussed issues and concerns WDFW had with plan and how to resolve them
June 28, 2004	WDFW	Hal Beecher	Email	• Revised Draft of LWD plan based on June 16 meeting. •
June 29, 2004	WDFW	Hal Beecher	Telephone Call	• Discuss revised draft sent via email the previous day.
June 29, 2004	WDFW	Hal Beecher	Email	• Revised draft of LWD plan based on telephone call earlier in the day.
July 8, 2004	WDFW	Hal Beecher	Telephone Call	• Discussed revised draft of LWD Plan sent via email on July 8.
July 8, 2004	WDFW	Hal Beecher	Emaill	• Sent revised draft of LWD Plan based on telephone call earlier in the day..
July 12, 2004`	WDFW	Hal Beecher	Telephone Call	• Hal advised latest draft of plan is satisfactory.with change from 2005 to 2004 for baseline study- which was agreed to.

Abbreviations

AR	American Rivers
CC	Conservation Caucus (TU & AR)
CIT	Cowlitz Indian Tribe
CWA	Cowlitz Wildlife Area
DNR	Department of Natural Resources
FTC	Fisheries Technical Committee
GCDE	Governor's Committee on Disability Issues and Employment
IAC	Interagency Committee for Outdoor Recreation Tacoma Power
LCBC	Lewis County Board of Commissioners/Lewis County
LCSO	Lewis County Sheriff's Office
NOAA	NOAA Fisheries
TU	Trout Unlimited
USDAFS	U.S. Department of Agriculture – Forest Service
USFWS	U.S. Fish and Wildlife Service
WDEO	Washington Department of Ecology
WDFW	Washington Department of Fish and Wildlife
WMCC	Wildlife Management Coordinating Committee includes USFWS, WDFW,
WSPRC	Washington State Parks and Recreation Commission
YN	Yakama Nation

Appendix B - Response to Comments

The Washington Department of Fish and Wildlife submitted the only comment. It is attached in Appendix C. The letter resulted in extensive discussions, edits to the plan -both by Hal Beecher of WDFW and Tacoma Power. After a face to face meeting with Mr. Beecher and the exchange of a number of drafts with him, Tacoma Power was able to resolve WDFW's original issues.

Rather than list and address all these issues, a copy of a letter sent by Mr. Beecher is attached in Appendix C. In this letter he states that "The modifications to the Large Woody Debris Management Plan satisfactorily address concerns I had raised about earlier drafts." He goes on in this letter to discuss how revised plan addresses WDFW's issues.

Appendix C – Comments